

APPENDIX J1

TRAFFIC IMPACT ANALYSIS



Gateway South Building 4

TRAFFIC IMPACT ANALYSIS

CITY OF SAN BERNARDINO

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CCI	Construction Cost Index
CMP	Congestion Management Program
DIF	Development Impact Fee
EA	Existing Plus Ambient Growth
EAC	Existing Plus Ambient Growth Plus Cumulative
EAP	Existing Plus Ambient Growth Plus Project
EAPC	Existing Plus Ambient Growth Plus Project Plus Cumulative
E+P	Existing Plus Project
FHWA	Federal Highway Administration
HCM	Highway Capacity Manual
ITE	Institute of Transportation Engineers
LOS	Level of Service
MUTCD	Manual on Uniform Traffic Control Devices
NCHRP	National Cooperative Highway Research Program
NP	No Project (or Without Project)
PCE	Passenger Car Equivalents
PHF	Peak Hour Factor
Project	Gateway South Building 4
RTP	Regional Transportation Plan
SANBAG	San Bernardino Association of Governments
SBTAM	San Bernardino Transportation Analysis Model
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCS	Sustainable Communities Strategy
SHS	State Highway System
sf	Square Feet
TIA	Traffic Impact Analysis
Vphgph	Vehicles Per Hour Green Per Lane
v/c	Volume to Capacity
WP	With Project

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1 INTRODUCTION

This report presents the results of the traffic impact analysis (TIA) for the proposed Gateway South Building 4 (referred to as “Project”) located south of Dumas Street and west of Waterman Avenue in the City of San Bernardino as shown on Exhibit 1-1.

The purpose of this traffic impact analysis is to evaluate the potential circulation system deficiencies that may result from the development of the proposed Project, and to recommend improvements to achieve acceptable circulation system operational conditions. As directed by City of San Bernardino staff, this traffic study has been prepared in accordance with the City of San Bernardino Traffic Impact Study Guidelines (June 2015), and also where appropriate addresses requirements as identified by the San Bernardino County Congestion Management Program (CMP) *Guidelines for CMP Traffic Impact Analysis Reports* (Appendix C, 2016 Update), the California Department of Transportation (Caltrans) *Guide for the Preparation of Traffic Impact Studies* (December 2002), and consultation with City staff during the scoping process. (1) (2) (3) The approved Project Traffic Study Scoping agreement is provided in Appendix 1.1 of this TIA.

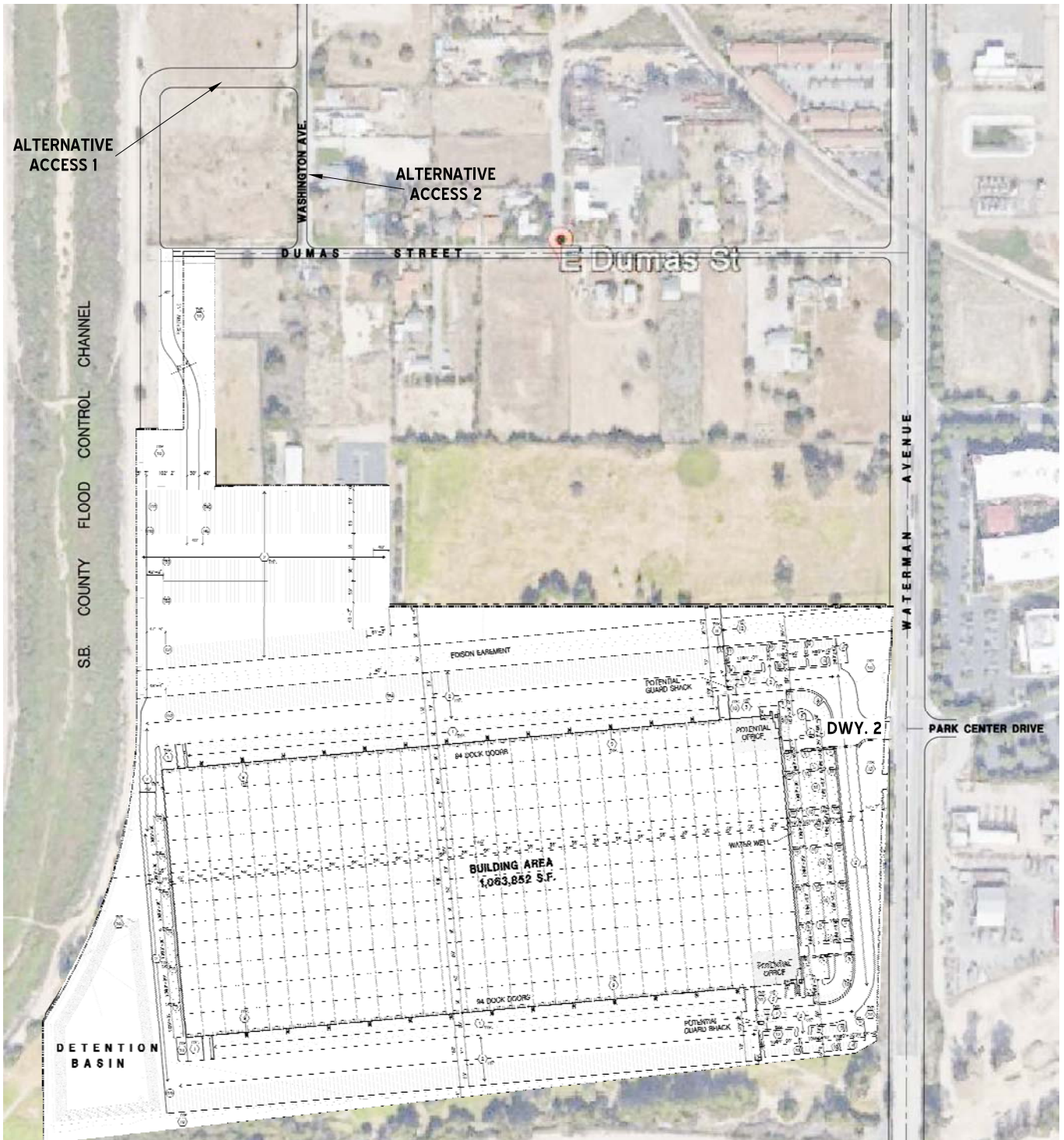
1.1 PROJECT OVERVIEW

The Project is proposed to consist of a total of 1,064,880 square feet (sf) of high-cube warehouse/distribution center use. For the purposes of this traffic study, the Project anticipated to be developed in a single phase with an anticipated opening year of 2018.

The Project is proposed to have access on Washington Avenue via Dumas Street and Waterman Avenue via Driveway 2 (western extension of Park Center Drive). All Project access points are assumed to allow for full-access. Heavy trucks are anticipated to utilize both Washington Avenue and the Waterman Avenue access points. Passenger cars are anticipated to utilize the access on Waterman Avenue only. 2 access alternatives have been evaluated for the purposes of this traffic study: one that assumes an access point off of Washington Avenue, north of Dumas Street, and one that assumes access to Dumas Street at Washington Avenue. Regional access to the Project site will be provided by the I-215 Freeway via Orange Show Road, I-10 Freeway via Waterman Road.

Trips generated by the Project’s proposed land uses have been estimated based on trip generation rates collected by the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 9th Edition, 2012. (4) The Project is estimated to generate a net total of 2,941 passenger-car-equivalent (PCE) trip-ends per day on a typical weekday with approximately 171 net AM PCE peak hour trips and 200 net PM PCE peak hour trips. The assumptions and methods used to estimate the Project’s trip generation characteristics are discussed in greater detail in Section 4.1 *Project Trip Generation* of this report.

EXHIBIT 1-1: PRELIMINARY SITE PLAN



1.2 ANALYSIS SCENARIOS

For the purposes of this traffic study, potential impacts to traffic and circulation have been assessed for each of the following conditions:

- Existing (2017)
- Existing plus Project (E+P)
- Existing plus Ambient Growth (EA) (2018)
- Existing plus Ambient Growth plus Project (EAP) (2018)
- Existing plus Ambient Growth plus Cumulative (EAC) (2018)
- Existing plus Ambient Growth plus Project plus Cumulative (EAPC) (2018)
- Horizon Year (2040) Without Project
- Horizon Year (2040) With Project

1.2.1 EXISTING (2017) CONDITIONS

Information for Existing (2017) conditions is disclosed to represent the baseline traffic conditions as they existed at the time this report was prepared.

1.2.2 EXISTING PLUS PROJECT CONDITIONS

The Existing Plus Project (E+P) analysis determines circulation system deficiencies that would occur on the existing roadway system in the scenario of the Project being placed upon Existing conditions. The E+P analysis is intended to identify the project-specific traffic impacts associated solely with the development of the proposed Project based on a comparison of the E+P traffic conditions to Existing (2017) conditions.

1.2.3 EXISTING PLUS AMBIENT GROWTH (EA) AND EXISTING PLUS AMBIENT GROWTH PLUS PROJECT (EAP) CONDITIONS

The EA (2018) and EAP (2018) traffic conditions analyses determine potential cumulative traffic impacts based on a comparison of the EAP traffic conditions to EA conditions. To account for background traffic growth, an ambient growth factor from Existing conditions of 3.0% (3 percent per year over 1 year) has been included for 2018 conditions.

1.2.4 EXISTING PLUS AMBIENT GROWTH PLUS CUMULATIVE (EAC) AND EXISTING PLUS AMBIENT GROWTH PLUS PROJECT PLUS CUMULATIVE (EAPC) CONDITIONS

The EAC (2018) and EAPC (2018) conditions analysis determines the potential near-term cumulative circulation system deficiencies. To account for background traffic growth, traffic associated with other known cumulative development projects in conjunction with an ambient growth factor from Existing conditions of 3.0% (3 percent per year over 1 year) has been included for 2018 conditions. This comprehensive list was compiled from information from a recent traffic study in the City of San Bernardino and consultation with City staff.

1.2.5 HORIZON YEAR (2040) CONDITIONS

The Horizon Year (2040) conditions analysis will be utilized to determine if improvements funded through local and regional transportation mitigation fee programs, such as the City of San Bernardino Development Impact Fee (DIF) program, or other approved funding mechanism can accommodate the cumulative traffic at the target Level of Service (LOS) identified by the City of San Bernardino. If the planned and funded improvements can provide the necessary improvements in delay, then the Project's payment into these established fee programs will be considered as long-range cumulative mitigation. Other improvements needed beyond the "funded" improvements (such as localized improvements to non-funded facilities) are identified as such and would be subject to fair share or as identified by City staff. Traffic projections for Horizon Year conditions were derived from the San Bernardino County Transportation Analysis Model (SBTAM) using accepted procedures for model forecast refinement and smoothing.

The currently adopted Southern California Association of Governments (SCAG) 2016 Regional Transportation Plan (RTP) / Sustainable Communities Strategy (SCS) (April 2016) growth forecasts for the City of San Bernardino identifies projected growth in population of 211,900 in 2012 to 257,400 in 2040, or a 21.47 percent increase over the 28-year period. (5) The change in population equates to roughly a 0.70 percent annual growth rate, compounded annually. Similarly, growth over the same 28-year period in households is projected to increase by 30.02 percent, or a 0.94 percent annual growth rate. Finally, growth in employment over the same 28-year period is projected to increase by 44.99 percent, or a 1.34 percent annual growth rate.

Based on a comparison of Existing traffic volumes to the Horizon Year (2040) forecasts, the average growth rate is estimated at approximately 1.78 percent compounded annually between Existing and Horizon Year (2040) traffic conditions. The annual growth rate at each individual intersection is not lower than 1.09 percent to as high as 3.55 percent compounded annually over the same time period. Therefore, the annual growth rate utilized for the purposes of this analysis would appear to conservatively approximate the anticipated regional growth in traffic volumes in the City of San Bernardino for near term and long range traffic conditions, especially when considered along with the addition of cumulative development project traffic and project-related traffic. As such, the growth in traffic volumes assumed in this traffic impact analysis would tend to overstate, as opposed to understate, the potential impacts to traffic and circulation.

1.3 STUDY AREA

To ensure that this TIA satisfies the City of San Bernardino's traffic study requirements, Urban Crossroads, Inc. prepared a project traffic study scoping package for review by City staff prior to the preparation of this report. The Agreement provides an outline of the Project study area, trip generation, trip distribution, and analysis methodology. The Agreement approved by the City is included in Appendix 1.1.

1.3.1 INTERSECTIONS

The following 16 study area intersections listed in Table 1-1 and shown on Exhibit 1-2 were selected for this TIA based on consultation with City of San Bernardino staff. In general, the study

area includes intersections where the Project is anticipated to contribute 50 or more peak hour trips, with the exception of the intersections denoted with an asterisk below, which were either included at the request of the City of San Bernardino or since the intersection provides access to the Project.

TABLE 1-1: INTERSECTION ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction	CMP?
1	I-215 SB Ramps / Auto Center Rd. (*)	Caltrans	No
2	I-215 NB Ramps / Auto Center Rd.	Caltrans	No
3	E St. / Auto Center Rd. / Orange Show Rd.	City of San Bernardino	Yes
4	Arrowhead Av. / Orange Show Rd.	City of San Bernardino	No
5	Washington Av. / Orange Show Rd.	City of San Bernardino	No
6	Washington Av. / Driveway 1 (Access Alternative 1 only) (*)	City of San Bernardino	No
7	Washington Av. / Dumas St. (*)	City of San Bernardino	No
8	I-10 EB Off-ramp / E. Redlands Bl. (*)	Caltrans	No
9	S. Waterman Av. / Orange Show Rd.	City of San Bernardino	No
10	S. Waterman Av. / Dumas St.	City of San Bernardino	No
11	S. Waterman Av. / Park Center Dr.	City of San Bernardino	No
12	S. Waterman Av. / Hospitality Ln.	City of San Bernardino	Yes
13	S. Waterman Av. / I-10 WB On-Ramp	Caltrans	No
14	S. Waterman Av. / I-10 EB Ramps (*)	Caltrans	No
15	S. Waterman AV. / E. Redlands Bl. (*)	City of San Bernardino	Yes
16	I-10 WB Ramps/Carnegie Dr. / Hospitality Ln. (*)	Caltrans	No

(*) = Fewer than 50 peak hour trips

The “50 peak hour trip” criterion utilized by the City of San Bernardino is consistent with the methodology employed by the County of San Bernardino, and generally represents a minimum number of trips at which a typical intersection would have the potential to be substantively impacted by a given development proposal. Although each intersection may have unique operating characteristics, this traffic engineering rule of thumb is a widely utilized tool for estimating a potential area of impact (i.e., study area).

1.3.2 FREEWAY MAINLINE SEGMENTS

Study area freeway mainline analysis locations were selected based on Caltrans traffic study guidelines, which may require the analysis of State highway facilities. (3) Consistent with recent Caltrans guidance, and because impacts to freeway segments tend to dissipate with distance from the point of State Highway System (SHS) entry, quantitative study of freeway segments beyond those immediately adjacent to the point of entry typically is not required. As such, this study evaluates the following freeway segments adjacent to the point of entry to the SHS (see Table 1-2):

EXHIBIT 1-2: LOCATION MAP



LEGEND:

- 0 = EXISTING INTERSECTION ANALYSIS LOCATION
- 0 = FUTURE INTERSECTION ANALYSIS LOCATION
- 0 = CMP INTERSECTION



TABLE 1-2: FREEWAY MAINLINE SEGMENT ANALYSIS LOCATIONS

ID	Freeway Mainline Segments
1	I-215 – Northbound, North of Auto Center Dr.
2	I-215 – Northbound, South of Auto Center Dr.
3	I-215 – Southbound, North of Auto Center Dr.
4	I-215 – Southbound, South of Auto Center Dr.
5	I-10 – Eastbound, West of Waterman Av.
6	I-10 – Eastbound, East of Waterman Av.
7	I-10 – Westbound, West of Waterman Av.
8	I-10 – Westbound, East of Waterman Av.

1.3.3 FREEWAY MERGE/DIVERGE RAMP JUNCTIONS

The study area freeway merge/diverge ramp junction analysis locations include the following freeway ramp junctions for each direction of flow as shown on Table 1-3, where the Project is anticipated to contribute 25 or more one-way peak hour trips:

TABLE 1-3: FREEWAY MERGE/DIVERGE RAMP JUNCTION ANALYSIS LOCATIONS

ID	Freeway Merge/Diverge Ramp Junctions
1	I-215 – Northbound, On-Ramp at Auto Center Dr.
2	I-215 – Northbound, Off-Ramp at Auto Center Dr.
3	I-215 – Southbound, Off-Ramp at Auto Center Dr.
4	I-215 – Southbound, Loop On-Ramp (Upstream) at Auto Center Dr.
5	I-215 – Southbound, Loop On-Ramp (Downstream) at Auto Center Dr.
6	I-10 – Eastbound, Off-Ramp at Waterman Av.
7	I-10 – Eastbound, On-Ramp at Waterman Av.
8	I-10 – Westbound, On-Ramp at Waterman Av.
9	I-10 – Westbound, Off-Ramp at Waterman Av.

1.4 ANALYSIS FINDINGS

This section provides a summary of the analysis results for Existing (2017), E+P, EA (2018) EAP (2018), EAC (2018), EAPC (2018), and Horizon Year (2040).

1.4.1 INTERSECTIONS

Existing (2017) Conditions

There are no study area intersections currently operating at an unacceptable LOS during the peak hours under Existing (2017) traffic conditions.

E+P Conditions

The intersection analysis results indicate that the addition of Project traffic is not anticipated to result in any LOS deficiencies. As shown below, volume to capacity (v/c) ratios were calculated

at intersections anticipated to operate at an LOS C or worse, consistent with the City of San Bernardino TIA guidelines:

#	Intersection	Traffic Control ²	Existing (2017)				E+P				Change in v/c ⁶		Significant Impact? ⁵
			LOS ⁷		Average v/c ³		LOS ⁷		Average v/c ³		AM	PM	
			AM	PM	AM	PM	AM	PM	AM	PM			
2	I-215 NB Ramps / Auto Center Rd.	TS	B	C	--	0.72	C	C	0.76	0.75	--	0.03	No
3	E St. / Auto Center Rd. / Orange Show Rd. ⁴	TS	C	D	0.70	0.83	D	D	0.72	0.85	0.02	0.02	No
4	Arrowhead Av. / Orange Show Rd.	TS	C	C	0.49	0.54	C	D	0.50	0.57	0.01	0.03	No
8	I-10 EB Ramps / E. Redlands Bl.	TS	C	C	0.55	0.49	C	C	0.55	0.49	0.00	0.00	No
9	S. Waterman Av. / Orange Show Rd.	TS	D	C	0.64	0.87	D	D	0.64	0.90	0.00	0.03	No
10	S. Waterman Av. / Dumas St.	CSS	C	C	0.01	0.01	C	C	0.01	0.01	0.00	0.00	No
12	S. Waterman Av. / Hospitality Ln.	TS	D	D	0.65	0.74	D	D	0.66	0.74	0.01	0.00	No
15	S. Waterman Av. / E. Redlands Bl.	TS	D	D	0.66	0.93	D	D	0.66	0.93	0.00	0.00	No
16	I-10 WB Ramps/Carnegie Dr. / Hospitality Ln.	TS	D	D	0.51	0.74	D	D	0.52	0.74	0.01	0.00	No

The addition of Project traffic is not anticipated to result in a significant impact based on the City’s significance threshold. Section 2.8 *Thresholds of Significance* includes the detailed methodology used in this analysis related to the significance thresholds for the City of San Bernardino.

EA (2018) Conditions

There are no study area intersections that are anticipated to operate at an unacceptable LOS during the peak hours under EA (2018) conditions.

EAP (2018) Conditions

The intersection analysis results indicate that the addition of Project traffic is not anticipated to result in any LOS deficiencies for EAP (2018) conditions. As shown below, v/c ratios were calculated at intersections anticipated to operate at an LOS C or worse, consistent with the City of San Bernardino TIA guidelines:

#	Intersection	Traffic Control ²	EA (2018)								Δ v/c		Significant Impact? ⁵
			LOS ⁷		Average v/c ^{3,6}		LOS ⁷		Average v/c ³		Difference ⁶	PM	
			AM	PM	AM	PM	AM	PM	AM	PM			
2	I-215 NB Ramps / Auto Center Rd.	TS	C	C	0.76	0.75	C	C	0.78	0.77	0.02	0.02	No
3	E St. / Auto Center Rd. / Orange Show Rd. ⁴	TS	D	D	0.72	0.86	D	D	0.74	0.87	0.02	0.01	No
4	Arrowhead Av. / Orange Show Rd.	TS	C	C	0.50	0.57	C	D	0.52	0.59	0.02	0.02	No
8	I-10 EB Ramps / E. Redlands Bl.	TS	C	C	0.57	0.50	C	C	0.57	0.50	0.00	0.00	No
9	S. Waterman Av. / Orange Show Rd.	TS	D	C	0.66	0.89	D	D	0.66	0.92	0.00	0.03	No
10	S. Waterman Av. / Dumas St.	CSS	C	C	0.01	0.01	C	C	0.01	0.01	0.00	0.00	No
12	S. Waterman Av. / Hospitality Ln.	TS	D	D	0.67	0.75	D	D	0.67	0.75	0.00	0.00	No
15	S. Waterman Av. / E. Redlands Bl.	TS	D	D	0.68	0.96	D	D	0.68	0.96	0.00	0.00	No
16	I-10 WB Ramps/Carnegie Dr. / Hospitality Ln.	TS	D	D	0.53	0.76	D	D	0.54	0.76	0.01	0.00	No

The addition of Project traffic is not anticipated to result in a significant impact based on the City’s significance threshold. Section 2.8 *Thresholds of Significance* includes the detailed methodology used in this analysis related to the significance thresholds for the City of San Bernardino.

EAC (2018) Conditions

The following study area intersection is anticipated to operate at an unacceptable LOS during the peak hours under EAC (2018) conditions:

- I-10 Westbound Ramps/Carnegie Dr. / Hospitality Ln. (#16) – LOS E PM peak hour only

EAPC (2018) Conditions

The intersection analysis results indicate that the addition of Project traffic is not anticipated to result in any additional LOS deficiencies for EAPC (2018) conditions. As shown below, v/c ratios were calculated at intersections anticipated to operate at an LOS C or worse, consistent with the City of San Bernardino TIA guidelines:

#	Intersection	Traffic Control ²	EAC (2018)				EAPC (2018)				Δ v/c		Significant Impact? ⁵
			LOS ⁷		Average v/c ^{3,6}		LOS ⁷		Average v/c ³		Difference ⁶		
			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	
1	I-215 SB Ramps / Auto Center Rd.	TS	C	--	0.54	0.46	C	B	0.55	--	0.01	--	No
2	I-215 NB Ramps / Auto Center Rd.	TS	C	C	0.87	0.89	C	C	0.89	0.91	0.02	0.02	No
3	E St. / Auto Center Rd. / Orange Show Rd. ⁴	TS	D	D	0.82	0.93	D	D	0.83	0.94	0.01	0.01	No
4	Arrowhead Av. / Orange Show Rd.	TS	D	C	0.60	0.67	D	D	0.60	0.69	0.00	0.02	No
8	I-10 EB Ramps / E. Redlands Bl.	TS	C	C	0.65	0.57	C	C	0.65	0.57	0.00	0.00	No
9	S. Waterman Av. / Orange Show Rd.	TS	D	D	0.75	1.08	D	D	0.77	1.10	0.02	0.02	No
10	S. Waterman Av. / Dumas St.	CSS	C	C	0.02	0.01	C	C	0.02	0.01	0.00	0.00	No
12	S. Waterman Av. / Hospitality Ln.	TS	D	D	0.75	0.79	D	D	0.76	0.79	0.01	0.00	No
13	S. Waterman Av. / I-10 WB On-Ramp	CSS	B	C	--	0.61	B	C	--	0.61	--	0.00	No
15	S. Waterman Av. / E. Redlands Bl.	TS	D	D	0.74	1.00	D	D	0.74	1.00	0.00	0.00	No
16	I-10 WB Ramps/Carnegie Dr. / Hospitality Ln.	TS	D	E	0.62	0.87	D	E	0.62	0.87	0.00	0.00	No

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

The addition of Project traffic is not anticipated to result in a significant impact based on the City’s significance threshold. Section 2.8 *Thresholds of Significance* includes the detailed methodology used in this analysis related to the significance thresholds for the City of San Bernardino.

Horizon Year (2040) Without Project Conditions

The following study area intersections are anticipated to operate at an unacceptable LOS during the peak hours under Horizon Year (2040) Without Project conditions, in addition to those previously identified under Existing, E+P, EA (2018), EAP (2018), EAC (2018) and EAPC (2018) traffic conditions:

- E St./Auto Center Rd. / Orange Show Rd. (#3) – LOS E AM peak hour & LOS F PM peak hour
- S. Waterman Av. / Orange Show Rd. (#9) – LOS E PM peak hour only
- S. Waterman Av. / I-10 Westbound On-ramp (#13) – LOS F PM peak hour only
- S. Waterman Av. / E. Redlands Bl. (#15) – LOS F PM peak hour only

Horizon Year (2040) With Project Conditions

The intersection analysis results indicate that the addition of Project traffic is not anticipated to result in any additional LOS deficiencies under Horizon Year (2040) With Project traffic conditions. As shown below, v/c ratios were calculated at intersections anticipated to operate at an LOS C or worse, consistent with the City of San Bernardino TIA guidelines:

#	Intersection	Traffic Control ²	2040 Without Project				2040 With Project				Δ v/c		Significant Impact? ⁵
			LOS ⁷		Average v/c ^{3,6}		LOS ⁷		Average v/c ³		Difference ⁶		
			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	
1	I-215 SB Ramps / Auto Center Rd.	TS	D	B	0.74	--	D	B	0.75	--	0.01	--	No
2	I-215 NB Ramps / Auto Center Rd.	TS	D	D	1.03	0.95	D	D	1.04	0.97	0.01	0.02	No
3	E St. / Auto Center Rd. / Orange Show Rd. ⁴	TS	E	F	0.80	1.05	E	F	0.82	1.07	0.02	0.02	Yes
4	Arrowhead Av. / Orange Show Rd.	TS	D	D	0.63	0.69	D	D	0.64	0.71	0.01	0.02	No
8	I-10 EB Ramps / E. Redlands Bl.	TS	D	C	0.75	0.66	D	C	0.75	0.66	0.00	0.00	No
9	S. Waterman Av. / Orange Show Rd.	TS	D	E	0.87	1.24	E	E	0.88	1.25	0.01	0.01	No
10	S. Waterman Av. / Dumas St.	CSS	C	C	0.02	0.02	C	C	0.03	0.02	0.00	0.00	No
11	S. Waterman Av. / Park Center Dr.	TS	A	D	--	0.80	B	D	--	0.80	--	0.00	No
12	S. Waterman Av. / Hospitality Ln.	TS	D	D	0.86	0.96	D	D	0.87	0.96	0.01	0.00	No
13	S. Waterman Av. / I-10 WB On-Ramp	CSS	B	F	--	1.16	B	F	--	1.16	--	0.00	Yes⁸
15	S. Waterman Av. / E. Redlands Bl.	TS	D	F	1.10	1.40	D	F	1.10	1.40	0.00	0.00	No
16	I-10 WB Ramps/Carnegie Dr. / Hospitality	TS	F	F	0.79	1.08	F	F	0.80	1.08	0.01	0.00	No

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

As shown above, the addition of Project traffic is anticipated to result in a significant cumulative impact based on the City’s significance threshold at the following intersections:

- E St./Auto Center Rd. / Orange Show Rd. (#3)
- S. Waterman Av. / I-10 Westbound On-Ramp (#13)

Section 2.8 *Thresholds of Significance* includes the detailed methodology used in this analysis related to the significance thresholds for the City of San Bernardino. Improvements have been identified for the intersection of S. Waterman Av. / I-10 WB Ramp as it is under the jurisdiction of Caltrans and Project contributes more than 50 peak hour trips to the intersection. Improvements have been recommended for the intersection of S. Waterman Av. / Orange Show Road to reduce the queuing issues at the intersection.

1.4.2 FREEWAY MAINLINE SEGMENTS

Existing (2017) Conditions

The freeway segments were found to operate at an acceptable LOS (i.e., LOS D or better) during the peak hours for Existing (2017) traffic conditions, with the exception of the following:

- I-10 Westbound, West of Waterman Av. – LOS E both peak hours
- I-10 Westbound, East of Waterman Av. – LOS F PM peak hour only

E+P Conditions

No additional freeway segments were found to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for E+P traffic conditions, in addition to those previously identified under Existing traffic conditions.

EA (2018) Conditions

The following freeway segments were found to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for EA (2018) traffic conditions, in addition to those previously identified under Existing and E+P traffic conditions:

- I-215 Northbound, South of Auto Center Dr. – LOS E PM peak hour only

- I-10 Eastbound, West of Waterman Av. – LOS E both peak hours

EAP (2018) Conditions

With the addition of Project traffic, no additional freeway segments were found to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for EAP (2018) traffic conditions, in addition to those listed under Existing, E+P, and EA (2018) traffic conditions.

EAC (2018) Conditions

No additional freeway segments were found to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for EAC (2018) traffic conditions, in addition to those previously identified under Existing, E+P, EA (2018), and EAP (2018) traffic conditions.

EAPC (2018) Conditions

With the addition of Project traffic, no additional freeway segments were found to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for EAPC (2018) traffic conditions, in addition to those previously identified under Existing, E+P, EA (2018), EAP (2018), and EAC (2018) traffic conditions.

Horizon Year (2040) Without Project Conditions

The following freeway segments were found to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for Horizon Year (2040) Without Project traffic conditions, in addition to those previously identified under Existing, E+P, EA (2018), EAP (2018), EAC (2018), and EAPC (2018) traffic conditions:

- I-215 Northbound, North of Auto Center Dr. – LOS E PM peak hour only
- I-215 Southbound, South of Auto Center Dr. – LOS E PM peak hour only

Horizon Year (2040) With Project Conditions

With the addition of Project traffic, no additional freeway segments were found to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for Horizon Year (2040) With Project traffic conditions, in addition to those previously identified under Existing, E+P, EA (2018), EAP (2018), EAC (2018), EAPC (2018), and Horizon Year (2040) Without Project traffic conditions.

1.4.3 FREEWAY MERGE/DIVERGE RAMP JUNCTIONS

Existing (2017) Conditions

The merge/diverge areas were found to operate at an acceptable LOS (i.e., LOS D or better) during the peak hours for Existing (2017) traffic conditions.

E+P Conditions

The merge/diverge areas were found to operate at an acceptable LOS (i.e., LOS D or better) during the peak hours for E+P traffic conditions.

EA (2018) Conditions

The following merge area was found to operate at an unacceptable LOS (i.e., LOS E or worse) during the PM peak hour for EA (2018) traffic conditions:

- I-10 Westbound, On-Ramp at Waterman Av. – LOS F PM peak hour only

EAP (2018) Conditions

With the addition of Project traffic, no additional merge/diverge areas were found to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for EAP (2018) traffic conditions, in addition to those listed under EA (2018) traffic conditions.

EAC (2018) Conditions

No additional merge/diverge areas were found to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for EAC (2018) traffic conditions, in addition to those previously identified under EA (2018), and EAP (2018) traffic conditions.

EAPC (2018) Conditions

With the addition of Project traffic, no additional merge/diverge areas were found to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for EAPC (2018) traffic conditions, in addition to those previously identified under EA (2018), EAP (2018), and EAC (2018) traffic conditions.

Horizon Year (2040) Without Project Conditions

The following merge/diverge areas were found to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for Horizon Year (2040) Without Project traffic conditions, in addition to those previously identified under EA (2018), EAP (2018), EAC (2018), and EAPC (2018) traffic conditions:

- I-215 Northbound, On-Ramp at Auto Center Dr. – LOS E PM peak hour only
- I-215 Southbound, Loop On-Ramp (Upstream) at Auto Center Dr. – LOS E PM peak hour only
- I-215 Southbound, Loop On-Ramp (Downstream) at Auto Center Dr. – LOS E PM peak hour only
- I-10 Eastbound, On-Ramp at Waterman Av. – LOS F AM peak hour only
- I-10 Westbound, Off-Ramp at Waterman Av. – LOS F both peak hours

Horizon Year (2040) With Project Conditions

With the addition of Project traffic, no additional merge/diverge areas were found to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for Horizon Year (2040) With Project traffic conditions, in addition to those previously identified under EA (2018), EAP (2018), EAC (2018), EAPC (2018), and Horizon Year (2040) Without Project traffic conditions.

1.4.4 QUEUING ANALYSIS AT WATERMAN AVENUE AND ORANGE SHOW ROAD

A queuing analysis was performed at the intersection for S. Waterman Avenue and Orange Show Road to assess vehicle queues that could potentially queue back to the at-grade railroad crossing

on Orange Show Road, just west of Waterman Avenue and on Waterman Avenue, south of Orange Show Road. The queuing analysis has been performed for near-term cumulative (EAPC) and long-range cumulative (Horizon Year) traffic conditions only.

EAPC (2018) Conditions

There are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for EAPC (2018) traffic conditions, with the exception of the northbound direction during the PM peak hour only. However, with recommended improvements in place for EAPC (2018) conditions, there are no movements anticipated to experience queuing issues during the weekday AM or weekday PM 95th percentile traffic flows.

Horizon Year (2040) With Project Conditions

There are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for Horizon Year (2040) With Project traffic conditions, with the exception of the eastbound direction during the PM peak hour only. Although the PM peak hour 95th percentile queue is anticipated to extend beyond the existing railroad crossing, there are currently existing crossing arms in place to prevent vehicles from spilling onto the tracks. It should also be noted that the PM peak hour 95th percentile queue is not anticipated to spill back to the intersection of Washington Avenue and Orange Show Road.

1.5 LOCAL AND REGIONAL FUNDING MECHANISMS

Transportation improvements within the City of San Bernardino are funded through a combination of direct project mitigation, development impact fee programs or fair share contributions, such as the City of San Bernardino Development Impact Fee (DIF) program. Identification and timing of needed improvements is generally determined through local jurisdictions based upon a variety of factors.

1.5.1 MEASURE “I” FUNDS

In 2004, the voters of San Bernardino County approved the 30-year extension of Measure “I”, a one-half of one percent sales tax on retail transactions, through the year 2040, for transportation projects including, but not limited to, infrastructure improvements, commuter rail, public transit, and other identified improvements. The Measure “I” extension requires that a regional traffic impact fee be created to ensure development is paying its fair share. A regional Nexus study was prepared by San Bernardino Association of Governments (SANBAG) and concluded that each jurisdiction should include a regional fee component in their local programs in order to meet the Measure “I” requirement. The regional component assigns specific facilities and cost sharing formulas to each jurisdiction and was most recently updated in November 2013. Revenues collected through these programs are used in tandem with Measure “I” funds to deliver projects identified in the Nexus Study.

While Measure “I” is a self-executing sales tax administered by SANBAG, it bears discussion here because the funds raised through Measure “I” have funded in the past and will continue to fund

new transportation facilities in San Bernardino County, including within the City of San Bernardino.

1.5.2 CITY OF SAN BERNARDINO DEVELOPMENT IMPACT FEE (DIF) PROGRAM

The City of San Bernardino has created its own local Development Impact Fee (DIF) program to impose and collect fees from new residential, commercial and industrial development for the purpose of funding roadways and intersections necessary to accommodate City growth as identified in the City's General Plan Circulation Element. The City's DIF includes a Regional Circulation System Fee to comply with Measure "I" and a Local Circulation System Fee to address transportation improvements which are locally significant. The fee schedule was recently updated in June 2014 and is adjusted annually based upon changes in the construction cost index (CCI). Under the City's DIF program, the City may grant to developers a credit against specific components of fees when those developers construct certain facilities and landscaped medians identified in the list of improvements funded by the DIF program. The City may grant to developers a credit against specific components of fees when those developers construct certain facilities and landscaped medians identified in the list of improvements funded by the DIF program.

The timing to use the DIF fees is established through periodic capital improvement programs which are overseen by the City's Public Works Department. Periodic traffic counts, review of traffic accidents, and a review of traffic trends throughout the City are also periodically performed by City staff and consultants. The City uses this data to determine the timing of implementing the improvements listed in its facilities list. The City also uses this data to ensure that the improvements listed on the facilities list are constructed before the LOS falls below the LOS performance standards adopted by the City. In this way, the improvements are constructed before the LOS falls below the City's LOS performance thresholds.

The Project applicant will be subject to the City's DIF fee program, and will pay the requisite City DIF fees at the rates then in effect. The Project Applicant's payment of the requisite DIF fees at the rates then in effect pursuant to the DIF Program will mitigate its impacts to DIF-funded facilities. After the City's DIF fees are collected, they are placed in a separate interest bearing account pursuant to the requirements of Government Code § 66000 *et seq.* The timing to use the DIF fees is established through periodic capital improvement programs which are overseen by the City's Public Works Department.

1.5.3 FAIR SHARE CONTRIBUTION

Project mitigation may include a combination of fee payments to established programs (e.g., DIF), construction of specific improvements, payment of a fair share contribution toward future improvements or a combination of these approaches. Improvements constructed by development may be eligible for a fee credit or reimbursement through the program where appropriate (to be determined at the City of San Bernardino's discretion).

When off-site improvements are identified with a minor share of responsibility assigned to proposed development, the approving jurisdiction may elect to collect a fair share contribution or require the development to construct improvements. Detailed fair share calculations, for each

peak hour, has been provided on Table 1-4 for the applicable deficient intersections shown on Table 1-5.

There are no current plans to widen the I-215 freeway. The San Bernardino County Transportation Authority (SBCTA) is studying alternatives for the I-10 Corridor Project. The I-10 Corridor Project is currently in the environmental review phase. SBCTA has selected Express Lanes as the locally preferred alternative, which entails addition of two Express Lanes in each direction from Los Angeles/San Bernardino County Line to Ford Street in Redlands. However, the final alternative selection will be completed after the environmental review process. As the timing and funding of these future improvements are uncertain, they were not included as part of this analysis.

At this time, Caltrans has no fee programs or other mitigation programs in place for the mitigation of cumulative impacts caused by development projects in San Bernardino County on State Highway System (SHS) roadway segments. It should be noted that the Project contributes less than 1% of the total traffic volumes to all the study area freeway segments.

1.6 ON-SITE ROADWAY AND SITE ACCESS IMPROVEMENTS

This section summarizes Project site access and on-site circulation recommendations.

The Project is proposed to have access on Washington Avenue via Dumas Street and Waterman Avenue via Driveway 2 (western extension of Park Center Drive). All Project access points are assumed to allow for full-access. Heavy trucks are anticipated to utilize both Washington Avenue and the Waterman Avenue access points. Passenger cars are anticipated to utilize the access on Waterman Avenue only. Regional access to the Project site will be provided by the I-215 Freeway via Orange Show Road, I-10 Freeway via Waterman Road.

Roadway improvements necessary to provide site access and on-site circulation are assumed to be constructed in conjunction with site development and are described below. These improvements are required to be in place prior to occupancy.

1.6.1 SITE ADJACENT ROADWAY AND SITE ACCESS IMPROVEMENTS

The recommended site-adjacent roadway improvements for the Project are described below. These improvements need to be incorporated into the project description prior to Project approval or imposed as conditions of approval as part of the Project approval. Exhibit 1-3 illustrates the site-adjacent roadway improvement recommendations.

Exhibit 1-3 also illustrates the on-site and site adjacent recommended roadway lane improvements. Construction of on-site and site adjacent improvements are recommended to occur in conjunction with adjacent Project development activity or as needed for Project access purposes.

Waterman Avenue – Waterman Avenue is a north-south oriented roadway located along the Project's eastern boundary. Construct Waterman Avenue at its ultimate half-section width as a Major Arterial (100-foot right-of-way) between the Project's northern and southern boundaries in compliance with the applicable City of San Bernardino standards.

Table 1-4

Project Fair Share Calculations for Intersections

#	Intersection	Existing	Project	2040 WP ¹	Total New Traffic	Project % of New Traffic
3	E St. / Auto Center Rd. / Orange Show Rd.	AM: 2,989	82	4,367	1,378	6.0%
		PM: 4,312	95	5,557	1,245	7.6%
9	S. Waterman Av. / Orange Show Rd.	AM: 2,749	65	3,704	955	6.8%
		PM: 3,911	66	4,991	1,080	6.1%
13	S. Waterman Av. / I-10 WB On-Ramp	AM: 3,094	43	4,581	1,487	2.9%
		PM: 3,768	61	5,543	1,775	3.4%

* Highest percentage represented in **BOLD** and shown on Table 1-3.

¹ Project fair share based on net new trips between Existing and Horizon Year (2040) traffic conditions.

Table 1-5

Summary of Cumulative Impacts and Recommended Improvements

#	Intersection Location	Jurisdiction	EAC (2018)	EAPC (2018)	2040 Without Project	2040 With Project	Improvements in DIF Fee Program ¹	Total Cost ²	Fair Share % ³	Fair Share Cost ⁴
3	E St. / Auto Center Rd. / Orange Show Rd.	City of San Bernardino	None	None	Restripe and lengthen the storage for the existing dual NB left turn lanes Modify the traffic signal with overlap phasing on the EB right turn lane	Same	No	\$37,100	7.6%	\$2,831
9	S. Waterman Av. / Orange Show Rd.	City of San Bernardino	None	None	2nd NB left turn lane	Same	No	\$74,200	6.8%	\$5,050
13	S. Waterman Av. / I-10 WB On-Ramp	City of San Bernardino, Caltrans	None	None	NB right turn lane Traffic Signal	Same	No	\$74,200		\$5,050
Total								\$148,400		\$11,324
Total								\$419,972		\$14,433
Total Costs for Horizon Year (2040) Improvements								\$568,372		\$35,857

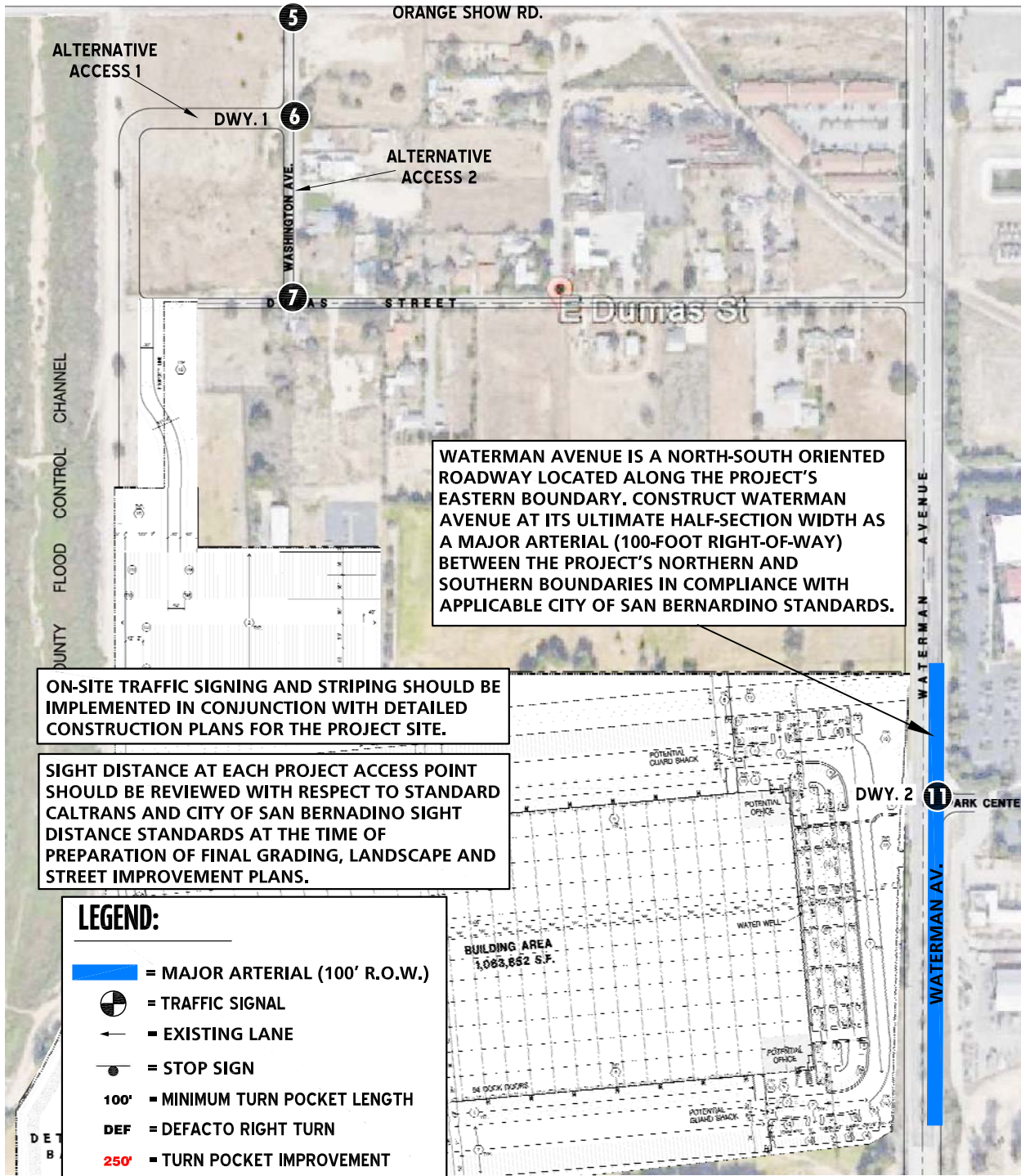
¹ Improvements included in City of San Bernardino DIF program for local and regional components.

² Costs have been estimated using the data provided in Appendix "G" of the CMP (2003 Update) for preliminary construction costs. Appendix "G" costs escalated by a factor of 1.484, except Traffic Signals, to reflect 2016 costs.

³ Program improvements constructed by project may be eligible for fee credit, at discretion of City. See Table 1-2 for Fair Share Calculations.

⁴ Rough order of magnitude cost estimate.

EXHIBIT 1-3: SITE ACCESS AND SITE ADJACENT ROADWAY RECOMMENDATIONS



ALTERNATIVE ACCESS 1

ALTERNATIVE ACCESS 2

5	6	7	7	11
S. Washington Av. & W. Orange Show Rd.	S. Washington Av. & Dwy. 1	Washington Av. & Dumas St.	Washington Av. & Dumas St.	S. Waterman Av. & Dwy. 2 / Park Center Dr.

A driveway (Driveway 2) is proposed on Waterman Avenue via the existing western extension of Park Center Drive. This driveway is proposed to allow for full access and would serve both trucks and passenger cars. Traffic signal modification will be required to accommodate the increased curb radius for truck access.

There were 2 alternative access points contemplated for the purposes of this traffic study along Washington Avenue. The first alternative assumes access directly on Washington Avenue, north of Dumas Street, and the second assumes access onto Washington Avenue via a southern extension of Washington Avenue at Dumas Street. It is our understanding that this driveway would serve trucks only and trucks would not utilize Dumas Street to the east of Washington Avenue. Trucks are anticipated to utilize Washington Street between Orange Show Road and Dumas Street. Wherever necessary, roadways adjacent to the Project, site access points and site-adjacent intersections will be constructed to be consistent with the identified roadway classifications and respective cross-sections in the City of San Bernardino General Plan Circulation Element.

On-site traffic signing and striping should be implemented in conjunction with detailed construction plans for the Project site.

Sight distance at each project access point should be reviewed with respect to standard Caltrans and City of San Bernardino sight distance standards at the time of preparation of final grading, landscape and street improvement plans.

1.6.2 QUEUING ANALYSIS AT THE PROJECT DRIVEWAYS

A queuing analysis was conducted along the site adjacent roadways of Washington Avenue, Dumas Street, and Waterman Avenue for Horizon Year (2040) traffic conditions to determine the turn pocket lengths necessary to accommodate long-range 95th percentile queues. The analysis was conducted for the weekday AM and weekday PM peak hours. The results have been provided in Appendix 1.2.

SimTraffic is designed to model networks of signalized and unsignalized intersections, with the primary purpose of checking and fine tuning signal operations. SimTraffic uses the input parameters from Synchro to generate random simulations. The 50th percentile, or average, queue represents the typical queue length for peak hour traffic conditions, while the 95th percentile queue is derived from the average queue plus 1.65 standard deviations. The 95th percentile queue is not necessarily ever observed; it is simply based on statistical calculations (or Average Queue plus 1.65 standard deviations). However, the average queue is the average of all the two-minute maximum queues observed by SimTraffic. The maximum back of queue observed for every two-minute period is recorded by SimTraffic. Many agencies utilize the 95th percentile queues for design purposes.

SimTraffic has been utilized to assess peak hour queuing at the site access driveways for Horizon Year With Project traffic conditions. The random simulations generated by SimTraffic have been utilized to determine the 50th and 95th percentile queue lengths observed for each turn lane. A SimTraffic simulation has been recorded five (5) times, during the weekday AM and weekday PM peak hours, and has been seeded for 30-minute periods with 60-minute recording intervals.

A vehicle is considered queued whenever it is traveling at less than 10 feet/second. A vehicle will only become queued when it is either at the stop bar or behind another queued vehicle. Although only the 95th percentile queue has been utilized for purposes of determining the necessary turn pocket storage lengths, the 50th percentile queues are also reported and can be found in Appendix 1.2. The 50th percentile queue is the maximum back of queue on a typical cycle during the peak hour, while the 95th percentile queue is the maximum back of queue with 95th percentile traffic volumes during the peak hour. In other words, if traffic were observed for 100 cycles, the 95th percentile queue would be the queue experienced with the 95th busiest cycle (or 5% of the time).

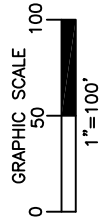
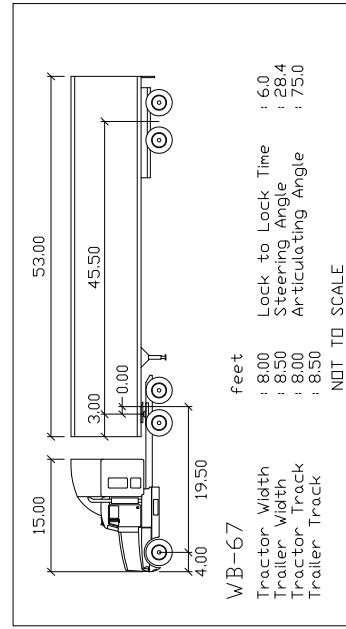
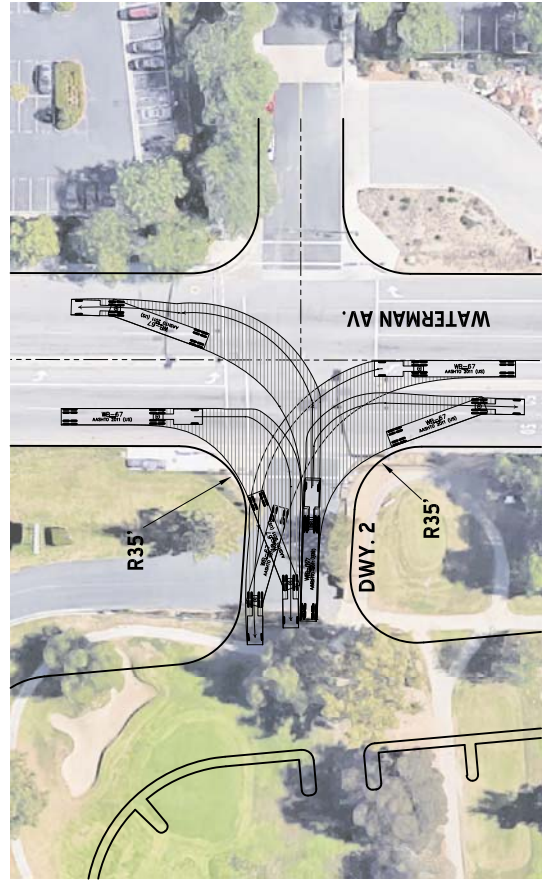
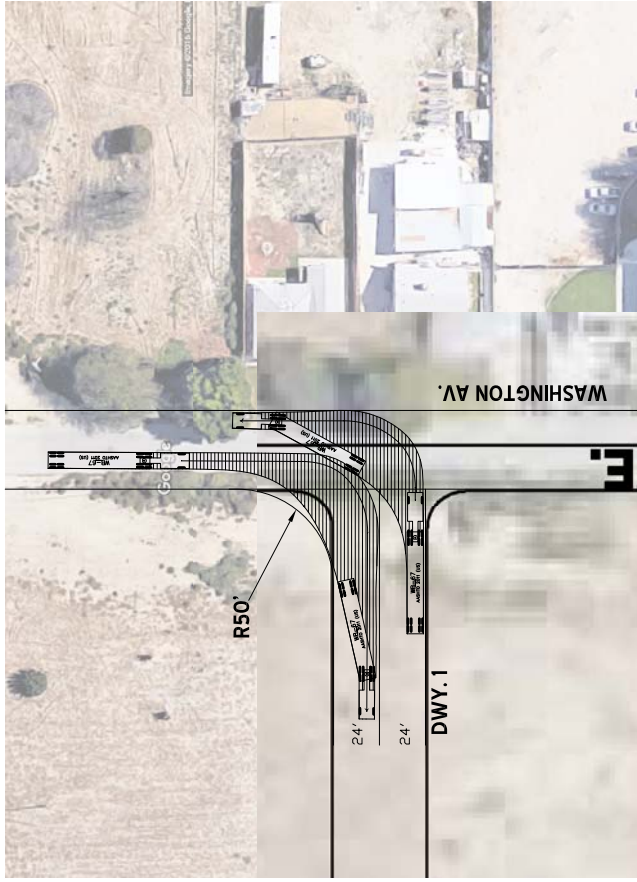
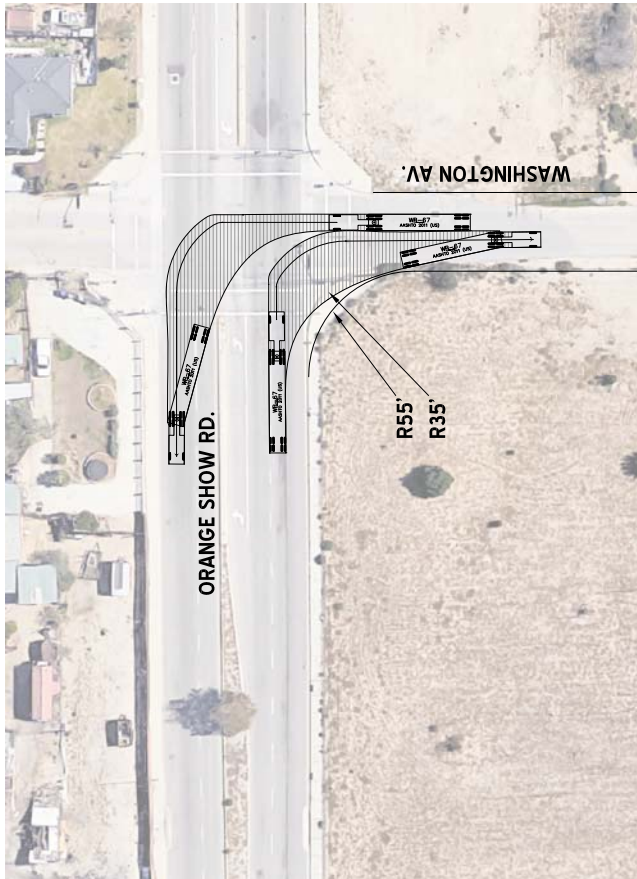
The storage length recommendations for the turning movement at the Project was shown previously on Exhibits 1-3.

1.7 TRUCK ACCESS AND CIRCULATION

Due to the typical wide turning radius of large trucks, a truck turning template has been overlaid on the site plan at each applicable Project driveway anticipated to be utilized by heavy trucks in order to determine appropriate curb radii and to verify that trucks will have sufficient space to execute turning maneuvers. The truck turning templates prepared for the Project are shown on Exhibit 1-4.

The intersection of Washington Avenue at Orange Shows Road would need to be improved to provide a curb radius of 55-feet (currently 35-feet) on the southwest corner in order to accommodate the turning radius of a WB-67 (53-foot trailer) truck. Driveway 1 on Washington Avenue would need to be designed with a 50-foot curb radius on the northwest corner in order to accommodate the turning radius of a WB-67 truck. Lastly, the planned 35-foot curbs at Driveway 2 on Waterman Avenue are anticipated to accommodate the turning radius of a WB-67 truck. Traffic signal modification will be required to accommodate the increased curb radius.

EXHIBIT 1-4: TRUCK ACCESS



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2 METHODOLOGIES

This section of the report presents the methodologies used to perform the traffic analyses summarized in this report. The methodologies described are generally consistent with City of San Bernardino traffic study guidelines.

2.1 LEVEL OF SERVICE

Traffic operations of roadway facilities are described using the term "Level of Service" (LOS). LOS is a qualitative description of traffic flow based on several factors such as speed, travel time, delay, and freedom to maneuver. Six levels are typically defined ranging from LOS A, representing completely free-flow conditions, to LOS F, representing breakdown in flow resulting in stop-and-go conditions. LOS E represents operations at or near capacity, an unstable level where vehicles are operating with the minimum spacing for maintaining uniform flow.

2.2 INTERSECTION CAPACITY ANALYSIS

The definitions of LOS for interrupted traffic flow (flow restrained by the existence of traffic signals and other traffic control devices) differ slightly depending on the type of traffic control. The LOS is typically dependent on the quality of traffic flow at the intersections along a roadway. The *Highway Capacity Manual* (HCM) 2010 methodology expresses the LOS at an intersection in terms of delay time for the various intersection approaches. (6) The HCM uses different procedures depending on the type of intersection control.

2.2.1 SIGNALIZED INTERSECTIONS

The City of San Bernardino requires signalized intersection operations analysis based on the methodology described in the HCM 2010. Intersection LOS operations are based on an intersection's average control delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. For signalized intersections LOS is directly related to the average control delay per vehicle and is correlated to a LOS designation as described in Table 2-1. Study area intersections have been evaluated using the Synchro (Version 9 Build 904) analysis software package.

TABLE 2-1: SIGNALIZED INTERSECTION LOS THRESHOLDS

Description	Average Control Delay (Seconds), $V/C \leq 1.0$	Level of Service, $V/C \leq 1.0$	Level of Service, $V/C > 1.0$
Operations with very low delay occurring with favorable progression and/or short cycle length.	0 to 10.00	A	F
Operations with low delay occurring with good progression and/or short cycle lengths.	10.01 to 20.00	B	F

Description	Average Control Delay (Seconds), V/C ≤ 1.0	Level of Service, V/C ≤ 1.0	Level of Service, V/C > 1.0
Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.01 to 35.00	C	F
Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	35.01 to 55.00	D	F
Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.01 to 80.00	E	F
Operation with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths.	80.01 and up	F	F

Source: HCM 2010

Consistent with Appendix C, Page C-13 of the San Bernardino County CMP, the following saturation flow rates, in vehicles per hour green per lane (vphgpl), will be utilized in the traffic analysis for signalized intersections:

Existing and Near-Term Traffic Conditions:

- Exclusive through: 1800 vphgpl
- Exclusive left: 1700 vphgpl
- Exclusive right: 1800 vphgpl
- Exclusive dual left: 1600 vphgpl
- Exclusive triple left: 1500 vphgpl

Synchro is a macroscopic traffic software program that is based on the signalized intersection capacity analysis as specified in the HCM. Macroscopic level models represent traffic in terms of aggregate measures for each movement at the study intersections. Equations are used to determine measures of effectiveness such as delay and queue length. The level of service and capacity analysis performed by Synchro takes into consideration optimization and coordination of signalized intersections within a network.

The peak hour traffic volumes have been adjusted using a peak hour factor (PHF) to reflect peak 15 minute volumes. Common practice for LOS analysis is to use a peak 15-minute rate of flow. However, flow rates are typically expressed in vehicles per hour. The PHF is the relationship between the peak 15-minute flow rate and the full hourly volume (e.g. $PHF = \frac{\text{Hourly Volume}}{4 \times \text{Peak 15-minute Flow Rate}}$). The use of a 15-minute PHF produces a more detailed analysis as compared to analyzing vehicles per hour. Existing PHFs have been used for all analysis scenarios, with the exception of Long Range traffic conditions. Per the HCM, PHF values over 0.95 often are indicative of high traffic volumes with capacity constraints on peak hour flows while lower PHF values are indicative of greater variability of flow during the peak hour. (6)

California Department of Transportation (Caltrans)

Per the Caltrans *Guide for the Preparation of Traffic Impact Studies*, the traffic modeling and signal timing optimization software package Synchro (Version 9) has been utilized to analyze signalized intersections under Caltrans' jurisdiction, which include interchange to arterial ramps (i.e. I-215 Freeway at Auto Center Drive and I-10 Freeway at Redlands Boulevard/Hospitality Lane). (3) Synchro is a macroscopic traffic software program that is based on the signalized intersection capacity analysis as specified in the Chapter 16 of the HCM. Macroscopic level models represent traffic in terms of aggregate measures for each movement at the study intersections. Equations are used to determine measures of effectiveness such as delay and queue length. The level of service and capacity analysis performed by Synchro takes into consideration optimization and coordination of signalized intersections within a network. Signal timing for the freeway arterial-to-ramp intersections have been obtained from Caltrans District 8 and were utilized for the purposes of this analysis.

2.2.2 UNSIGNALIZED INTERSECTIONS

The City of San Bernardino requires the operations of unsignalized intersections be evaluated using the methodology described the HCM 2010. (6) The LOS rating is based on the weighted average control delay expressed in seconds per vehicle (see Table 2-2).

TABLE 2-2: UNSIGNALIZED INTERSECTION LOS THRESHOLDS

Description	Average Control Delay Per Vehicle (Seconds)	Level of Service, V/C ≤ 1.0	Level of Service, V/C > 1.0
Little or no delays.	0 to 10.00	A	F
Short traffic delays.	10.01 to 15.00	B	F
Average traffic delays.	15.01 to 25.00	C	F
Long traffic delays.	25.01 to 35.00	D	F
Very long traffic delays.	35.01 to 50.00	E	F
Extreme traffic delays with intersection capacity exceeded.	> 50.00	F	F

Source: HCM 2010

At two-way or side-street stop-controlled intersections, LOS is calculated for each controlled movement and for the left turn movement from the major street, as well as for the intersection as a whole. For approaches composed of a single lane, the delay is computed as the average of all movements in that lane. For all-way stop controlled intersections, LOS is computed for the intersection as a whole.

2.3 FREEWAY OFF-RAMP QUEUING ANALYSIS

The study area for this TIA includes the freeway-to-arterial interchanges of the I-215 Freeway at Auto Center Road off-ramps. Consistent with Caltrans requirements, the 95th percentile queuing of vehicles has been assessed at the off-ramps to determine potential queuing impacts at the freeway ramp intersections on Auto Center Road. Specifically, the queuing analysis is utilized to identify any potential queuing and "spill back" onto the I-215 Freeway mainline from the off-ramps.

The traffic progression analysis tool and HCM intersection analysis program, Synchro, has been used to assess the potential impacts/needs of the intersections with traffic added from the proposed Project. Storage (turn-pocket) length recommendations at the ramps have been based upon the 95th percentile queue resulting from the Synchro progression analysis. The 95th percentile queue is the maximum back of queue with 95th percentile traffic volumes. The queue length reported is for the lane with the highest queue in the lane group.

There are two footnotes which appear on the Synchro outputs. One footnote indicates if the 95th percentile cycle exceeds capacity. Traffic is simulated for two complete cycles of the 95th percentile traffic in Synchro in order to account for the effects of spillover between cycles. In practice, the 95th percentile queue shown will rarely be exceeded and the queues shown with the footnote are acceptable for the design of storage bays. The other footnote indicates whether or not the volume for the 95th percentile queue is metered by an upstream signal. In many cases, the 95th percentile queue will not be experienced and may potentially be less than the 50th percentile queue due to upstream metering. If the upstream intersection is at or near capacity, the 50th percentile queue represents the maximum queue experienced.

A vehicle is considered queued whenever it is traveling at less than 10 feet/second. A vehicle will only become queued when it is either at the stop bar or behind another queued vehicle. Although only the 95th percentile queue has been reported in the tables, the 50th percentile queue can be found in the appendix alongside the 95th percentile queue for each ramp location. The 50th percentile maximum queue is the maximum back of queue on a typical cycle during the peak hour, while the 95th percentile queue is the maximum back of queue with 95th percentile traffic volumes during the peak hour. In other words, if traffic were observed for 100 cycles, the 95th percentile queue would be the queue experienced with the 95th busiest cycle (or 5% of the time). The 50th percentile or average queue represents the typical queue length for peak hour traffic conditions, while the 95th percentile queue is derived from the average queue plus 1.65 standard deviations. The 95th percentile queue is not necessarily ever observed; it is simply based on statistical calculations.

2.4 TRAFFIC SIGNAL WARRANT ANALYSIS METHODOLOGY

The term "signal warrants" refers to the list of established criteria used by Caltrans and other public agencies to quantitatively justify or ascertain the potential need for installation of a traffic signal at an otherwise unsignalized intersection. This TIA uses the signal warrant criteria presented in the latest edition of the Federal Highway Administration's (FHWA) *Manual on Uniform Traffic Control Devices (MUTCD)*, as amended by the *MUTCD 2014 California Supplement*, for all study area intersections. (8)

The signal warrant criteria for Existing study area intersections are based upon several factors, including volume of vehicular and pedestrian traffic, frequency of accidents, and location of school areas. Both the FHWA's *MUTCD* and the *MUTCD 2014 California Supplement* indicate that the installation of a traffic signal should be considered if one or more of the signal warrants are met. (8) Specifically, this TIA utilizes the Peak Hour Volume-based Warrant 3 as the appropriate representative traffic signal warrant analysis for existing traffic conditions. Warrant 3 criteria are basically identical for both the FHWA's *MUTCD* and the *MUTCD 2014 California Supplement*.

Warrant 3 is appropriate to use for this TIA because it provides specialized warrant criteria for intersections with rural characteristics (e.g. located in communities with populations of less than 10,000 persons or with adjacent major streets operating above 40 miles per hour). For the purposes of this study, the speed limit was the basis for determining whether Urban or Rural warrants were used for a given intersection.

Future unsignalized intersections, that currently do not exist, have been assessed regarding the potential need for new traffic signals based on future average daily traffic (ADT) volumes, using the Caltrans planning level ADT-based signal warrant analysis worksheets.

As shown on Table 2-3, traffic signal warrant analyses were performed for the following unsignalized study area intersections during the peak weekday conditions wherein the Project is anticipated to contribute the highest trips:

TABLE 2-3: TRAFFIC SIGNAL WARRANT ANALYSIS LOCATIONS

Washington Street / Driveway 1 (#6) (Access Alternative 1)
Washington Street / Dumas Street (#7)
S. Waterman Avenue / Dumas Street (#10)

Although the ramp intersections on S. Waterman Avenue at the I-10 Westbound and Eastbound ramps are also unsignalized, traffic signal warrants have not been evaluated at these locations due to lack of minor-leg (ramp) conflict volumes.

The Existing conditions traffic signal warrant analysis is presented in the subsequent section, Section 3 *Area Conditions* of this report. The traffic signal warrant analyses for future conditions are presented in Section 5 *E+P Traffic Analysis*, Section 6 *EA (2018) and EAP (2018) Traffic Analysis*, Section 7 *EAC (2018) and EAPC (2018) Traffic Analysis*, and Section 8 *Horizon Year (2040) Traffic Analysis* of this report.

It is important to note that a signal warrant defines the minimum condition under which the installation of a traffic signal might be warranted. Meeting this threshold condition does not require that a traffic control signal be installed at a particular location, but rather, that other traffic factors and conditions be evaluated in order to determine whether the signal is truly justified. It should also be noted that signal warrants do not necessarily correlate with LOS. An intersection may satisfy a signal warrant condition and operate at or above acceptable LOS or operate below acceptable LOS and not meet a signal warrant.

2.5 FREEWAY MAINLINE SEGMENT ANALYSIS METHODOLOGY

Consistent with recent Caltrans guidance and because impacts to freeway segments dissipate with distance from the point of SHS entry, quantitative study of freeway segments beyond those immediately adjacent to the point of entry is not required. As such, the traffic study has evaluated the freeway segments along the I-215 Freeway and I-10 Freeway. Because impacts to freeway segments dissipate with distance from the point of SHS entry, quantitative evaluation of freeway segments with less than 25 peak hour trips is not necessary.

The freeway system in the study area has been broken into segments defined by the freeway-to-arterial interchange locations. The freeway segments have been evaluated in this TIA based upon peak hour directional volumes. The freeway segment analysis is based on the methodology described in the HCM and performed using HCS2010 software. The performance measure preferred by Caltrans to calculate LOS is density. Density is expressed in terms of passenger cars per mile per lane. Table 2-4 illustrates the freeway segment LOS descriptions for each density range utilized for this analysis.

The number of lanes for existing baseline conditions has been obtained from field observations conducted by Urban Crossroads in March 2017. These existing freeway geometrics have been utilized for Existing, E+P, Opening Year Cumulative Without and With Project, and Horizon Year Without and With Project conditions.

The I-215 Freeway and I-10 Freeway mainline volume data were obtained from the Caltrans Performance Measurement System (PeMS) website for the segments of the I-215 Freeway at Auto Center Drive, and the I-10 Freeway at Waterman Avenue. The data was obtained from March 2017. In an effort to conduct a conservative analysis, the maximum value observed within the three-day period was utilized for the weekday morning (AM) and weekday evening (PM) peak hours. In addition, truck traffic, represented as a percentage of total traffic, has been utilized for the purposes of this analysis in an effort to not overstate traffic volumes and peak hour deficiencies. As such, actual vehicles (as opposed to passenger-car-equivalent volumes) have been utilized for the purposes of the basic freeway segment analysis. (6)

TABLE 2-4: DESCRIPTION OF FREEWAY MAINLINE LOS

Level of Service	Description	Density Range (pc/mi/ln) ¹
A	Free-flow operations in which vehicles are relatively unimpeded in their ability to maneuver within the traffic stream. Effects of incidents are easily absorbed.	0.0 – 11.0
B	Relative free-flow operations in which vehicle maneuvers within the traffic stream are slightly restricted. Effects of minor incidents are easily absorbed.	11.1 – 18.0
C	Travel is still at relative free-flow speeds, but freedom to maneuver within the traffic stream is noticeably restricted. Minor incidents may be absorbed, but local deterioration in service will be substantial. Queues begin to form behind significant blockages.	18.1 – 26.0
D	Speeds begin to decline slightly and flows and densities begin to increase more quickly. Freedom to maneuver is noticeably limited. Minor incidents can be expected to create queuing as the traffic stream has little space to absorb disruptions.	26.1 – 35.0
E	Operation at capacity. Vehicles are closely spaced with little room to maneuver. Any disruption in the traffic stream can establish a disruption wave that propagates throughout the upstream traffic flow. Any incident can be expected to produce a serious disruption in traffic flow and extensive queuing.	35.1 – 45.0
F	Breakdown in vehicle flow.	>45.0

¹ pc/mi/ln = passenger cars per mile per lane. Source: HCM

2.6 FREEWAY MERGE/DIVERGE RAMP JUNCTION ANALYSIS

The freeway system in the study area has been broken into segments defined by freeway-to-arterial interchange locations resulting in two existing on and off ramp locations. Although the HCM indicates the influence area for a merge/diverge junction is 1,500 feet, the analysis presented in this traffic study has been performed at all ramp locations with respect to the nearest on or off ramp at each interchange in an effort to be consistent with Caltrans guidance/comments on other projects Urban Crossroads has worked on in the region.

The merge/diverge analysis is based on the HCM Ramps and Ramp Junctions analysis method and performed using HCS2010 software. The measure of effectiveness (reported in passenger car/mile/lane) are calculated based on the existing number of travel lanes, number of lanes at the on and off ramps both at the analysis junction and at upstream and downstream locations (if applicable) and acceleration/deceleration lengths at each merge/diverge point. Table 2-5 presents the merge/diverge area level of service descriptions for each density range utilized for this analysis.

TABLE 2-5: DESCRIPTION OF FREEWAY MERGE AND DIVERGE LOS

Level of Service	Density Range (pc/mi/ln) ¹
A	≤10.0
B	10.0 – 20.0
C	20.0 – 28.0
D	28.0 – 35.0
E	>35.0
F	Demand Exceeds Capacity

¹ pc/mi/ln = passenger cars per mile per lane. Source: HCM

Similar to the basic freeway segment analysis, the I-215 Freeway and I-10 Freeway mainline volume data were obtained from the Caltrans PeMS website. The ramp data (per the count data presented in Appendix 3.1) were then utilized to flow conserve the mainline volumes to determine the remaining I-215 Freeway and I-10 Freeway mainline segment volumes. Flow conservation checks ensure that traffic flows from east to west and north to south (and vice versa) of the interchange area with no unexplained loss of vehicles. The data was obtained from March 2017. In an effort to conduct a conservative analysis, the maximum value observed within the three-day period was utilized for the weekday morning (AM) and weekday evening (PM) peak hours. In addition, truck traffic, represented as a percentage of total traffic, has been utilized for the purposes of this analysis in an effort to not overstate traffic volumes and peak hour deficiencies. (6) As such, actual vehicles (as opposed to passenger-car-equivalent volumes) have been utilized for the purposes of the freeway ramp junction (merge/diverge) analysis.

2.7 MINIMUM LEVEL OF SERVICE (LOS)

The definition of an intersection deficiency has been obtained from each of the applicable surrounding jurisdictions.

2.7.1 CITY OF SAN BERNARDINO

The definition of an intersection deficiency in the City of San Bernardino is based on the City of San Bernardino General Plan Circulation Element. The City of San Bernardino General Plan states that target LOS D be maintained at City intersections wherever possible.

2.7.2 CMP

The CMP definition of deficiency is based on maintaining a level of service standard of LOS E or better, except where an existing LOS F condition is identified in the CMP document.

2.7.3 CALTRANS

Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on State Highway Facilities (SHS) facilities, however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State highway facility is operating at less than this target LOS, the existing LOS should be maintained. In general, the region-wide goal for an acceptable LOS on all freeways, roadway segments, and intersections is LOS D. Consistent with the City of San Bernardino LOS threshold, LOS D will be used as the target LOS for freeway ramps, freeway segments, and freeway merge/diverge ramp junctions.

2.8 THRESHOLDS OF SIGNIFICANCE

This section outlines the methodology used in this analysis related to identifying circulation system deficiencies.

2.8.1 INTERSECTIONS

The City of San Bernardino TIA Guidelines identifies a “significant” traffic impact at an intersection when any of the following changes in the volume to capacity (v/c) ratios occur between the “without Project” and the “with Project” conditions:

LOS Without Project	V/C Difference
C	> 0.0400
D	> 0.0200
E, F	> 0.0100

Mitigation measures for direct Project impacts identified under E+P or EAP (2018) conditions would only mitigate the Project’s proportional change in delay or v/c ratio to pre-Project conditions or better. Mitigation measures will be identified for intersections that show a significant cumulative impact per the above changes in v/c, and operate at LOS D or worse under EAPC (2018) and Horizon Year (2040) with Project traffic conditions. The LOS with mitigation must be improved to LOS D or better for intersections.

It should be noted that for the purposes of this analysis, HCM 2000 methodology has been utilized to report v/c as Synchro does not report the average v/c using the HCM 2010 methodology.

2.8.2 CALTRANS FACILITIES

To determine whether the addition of project traffic to the SHS freeway facility (e.g., arterial-to-ramp intersection) would result in a deficiency, the following will be utilized:

- The traffic study finds that the LOS of a segment will degrade from D or better to E or F.
- The traffic study finds that the project will exacerbate an already deficient condition by contributing 50 or more peak hour trips. A segment that is operating at or near capacity is deemed to be deficient.

2.9 PROJECT FAIR SHARE CALCULATION METHODOLOGY

In cases where this TIA identifies that the Project would contribute additional traffic volumes to cumulative traffic deficiencies, Project fair share costs of improvements necessary to address deficiencies have been identified. The Project's fair share cost of improvements is determined based on the following equation, which is the ratio of Project traffic to new traffic, and new traffic is total future (Horizon Year) traffic less existing baseline traffic:

$$\text{Project Fair Share \%} = \text{Project Traffic} / (\text{2040 With Project Total Traffic} - \text{Existing Traffic})$$

The Project fair share contribution calculations are presented in Section 1.5 *Local and Regional Funding Mechanisms* of this TIA. The cost of implementing the improvements shown on Table 1-5 have been estimated based on the preliminary construction cost estimates found in Appendix G of the San Bernardino County CMP in conjunction with a total cost escalation factor of 1.484% to more closely approximate current (2017) costs. These cost estimates have been utilized in conjunction with the Project fair share percentages to determine the Project's fair share cost of the recommended cumulative improvements (see Table 1-4 and 1-5). These estimates are a rough order of magnitude only as they are intended only for discussion purposes and do not imply any legal responsibility or formula for contributions or mitigation.

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3 AREA CONDITIONS

This section provides a summary of the existing circulation network, the City of San Bernardino General Plan Circulation Network, and a review of existing peak hour intersection operations and traffic signal warrant analyses.

3.1 EXISTING CIRCULATION NETWORK

Pursuant to the agreement with City of San Bernardino staff (Appendix 1.1), the study area includes a total of 16 existing and future intersections as shown previously on Exhibit 1-2 where the Project is anticipated to contribute 50 or more peak hour trips, or at the request of the City staff. Exhibit 3-1 illustrates the study area intersections located near the proposed Project and identifies the number of through traffic lanes for existing roadways and intersection traffic controls.

3.2 CITY OF SAN BERNARDINO GENERAL PLAN CIRCULATION ELEMENT

As previously noted, the Project site is located within the City of San Bernardino. Exhibit 3-2 shows the City of San Bernardino General Plan Circulation Element, and Exhibit 3-3 illustrates the City of San Bernardino General Plan roadway cross-sections.

The roadway classifications and planned (ultimate) roadway cross-sections of the major roadways within the City of San Bernardino in the vicinity of the proposed Project as identified on the City's General Plan Circulation Element are described subsequently.

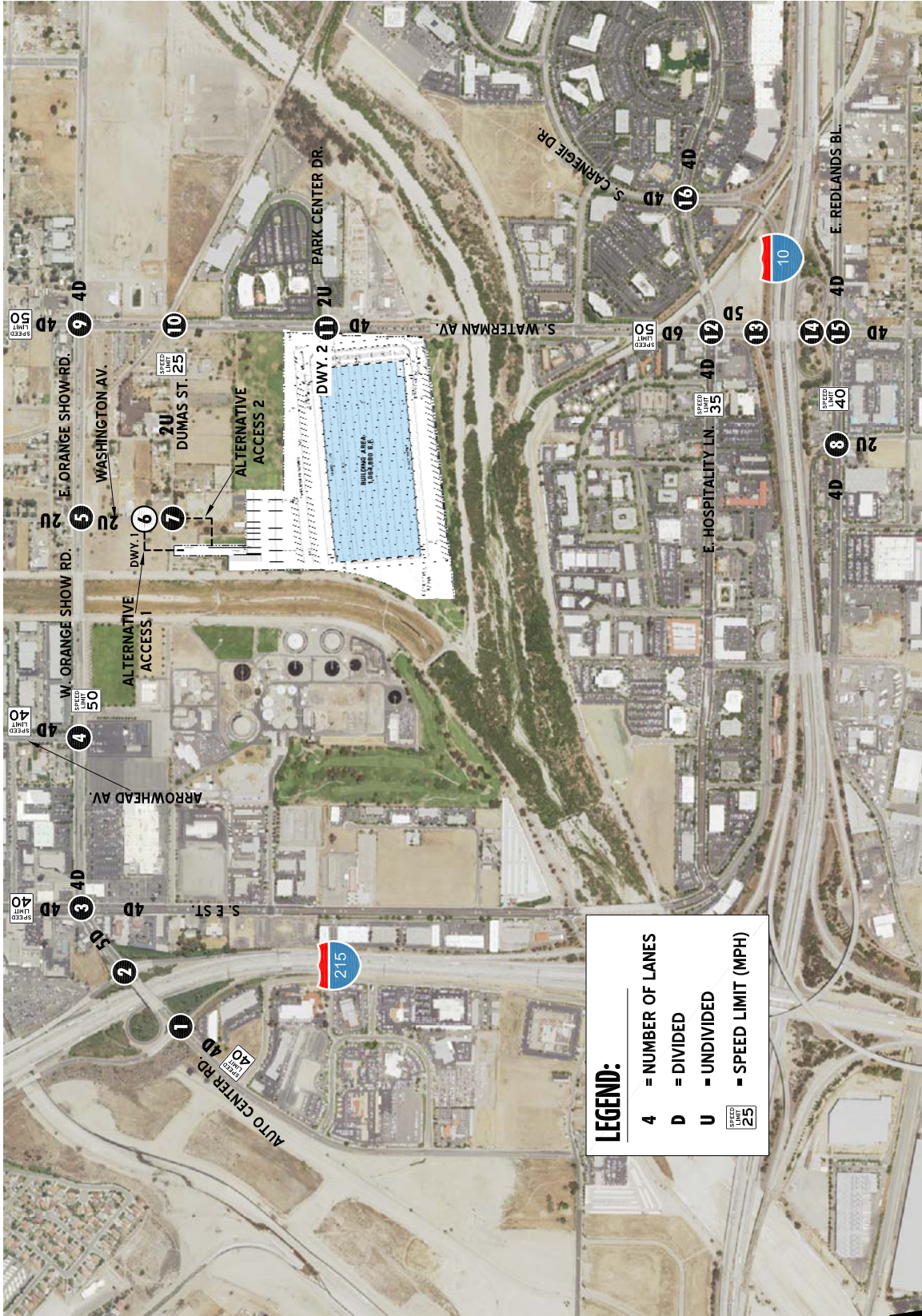
Major Arterials can accommodate six or eight travel lanes and may have raised medians. These facilities typically carry a high volume of traffic and are the primary thoroughfares linking San Bernardino with adjacent cities and the regional highway system. Driveway access to these roadways are typically limited in order to provide efficient high volume traffic flow. Examples of Major Arterials within the study area include:

- Auto Center Road / Orange Show Road
- E Street
- Arrowhead Avenue
- S. Waterman Avenue
- Hospitality Lane
- E. Redlands Boulevard

Local Streets are typically two-lane streets that connect with secondary arterials allowing local traffic to access the regional transportation facilities. Examples of Local Streets within the study area include:

- Washington Avenue
- Dumas Street

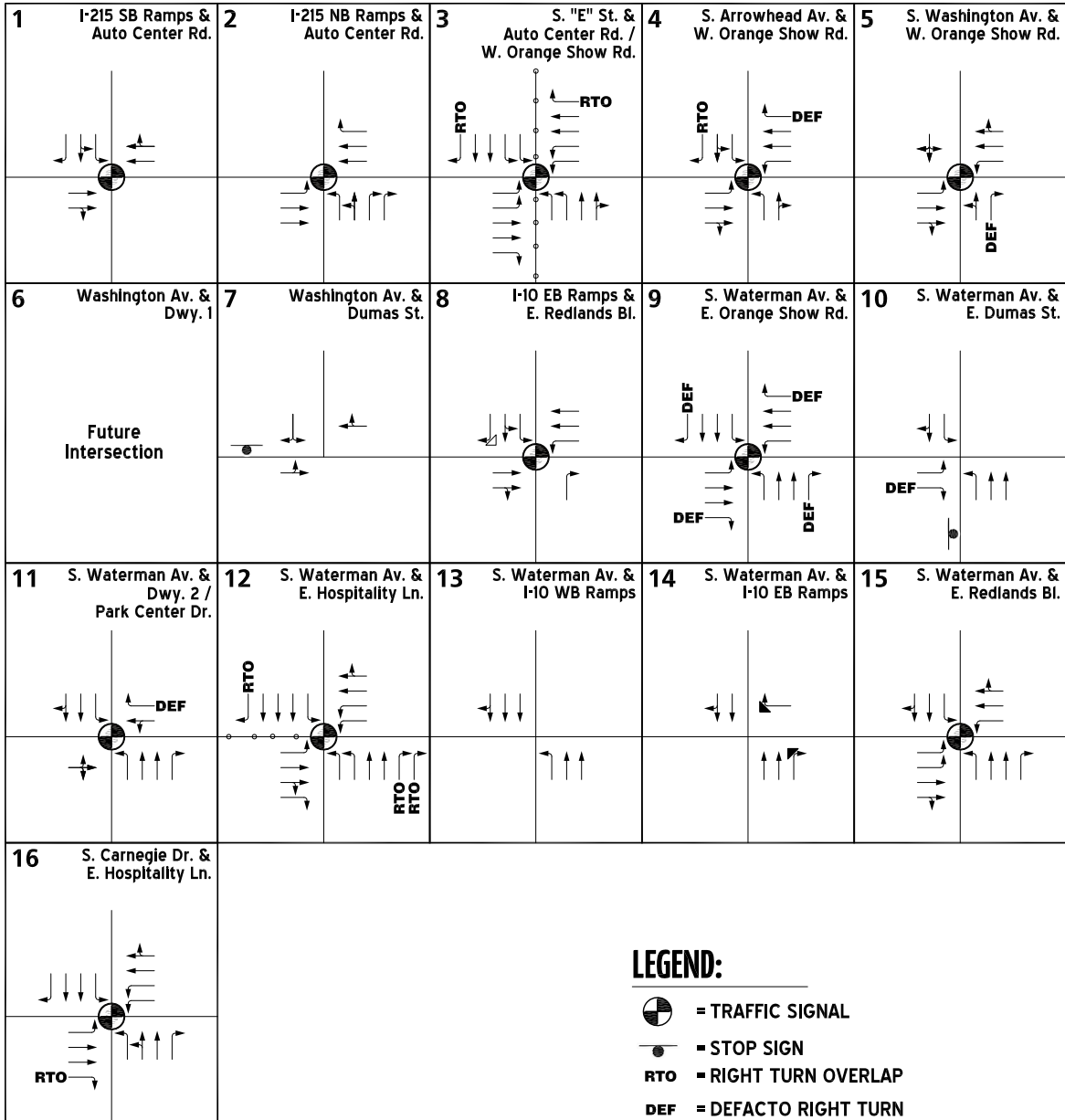
EXHIBIT 3-1 (10F2): EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS



LEGEND:

- 4 = NUMBER OF LANES
- D = DIVIDED
- U = UNDIVIDED
- [Speed Limit Sign] = SPEED LIMIT (MPH)

EXHIBIT 3-1 (2OF2): EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS



LEGEND:






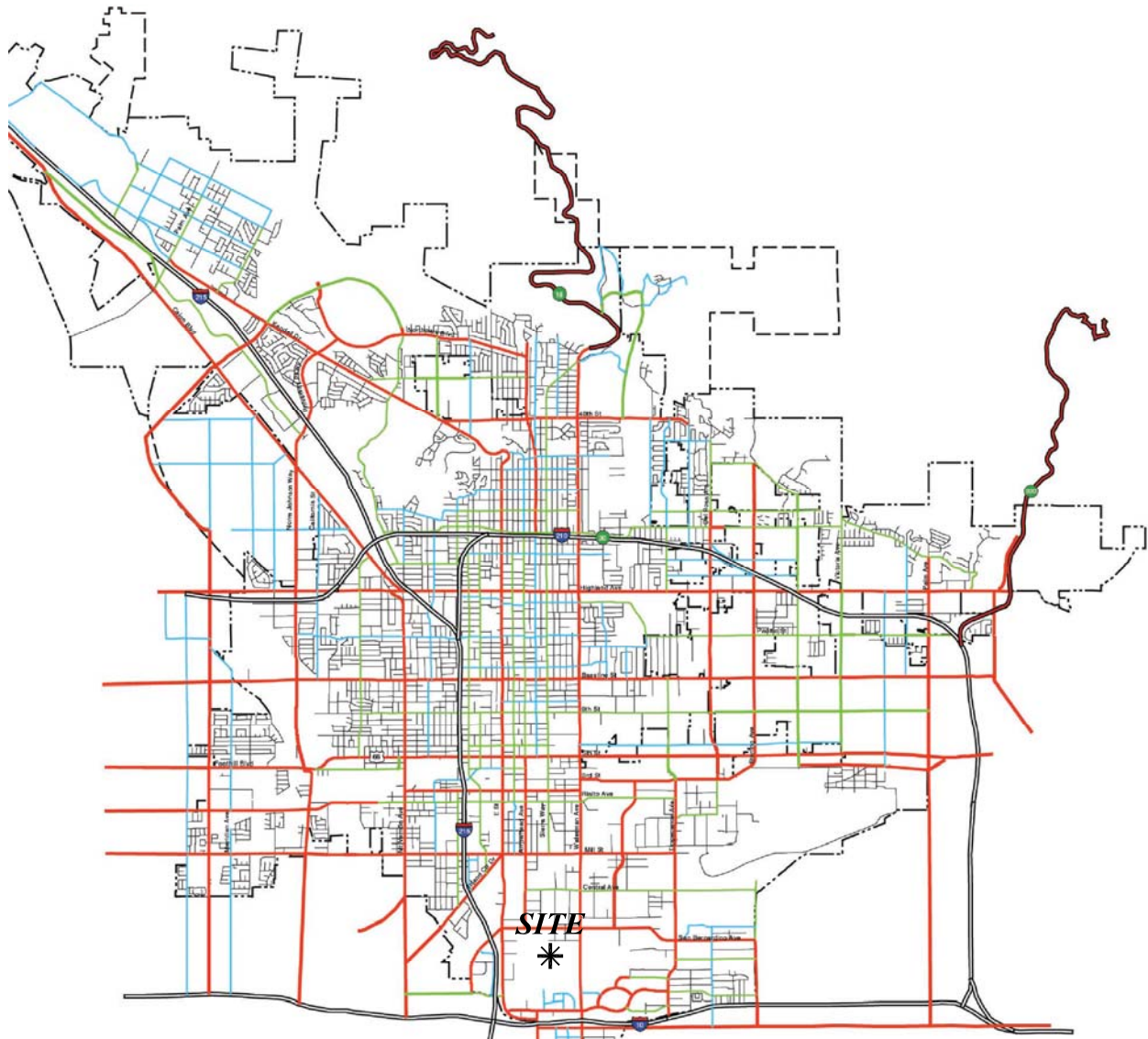
-  = TRAFFIC SIGNAL
-  = STOP SIGN
- RTO** = RIGHT TURN OVERLAP
- DEF** = DEFACTO RIGHT TURN
-  = FREE RIGHT TURN
-  = FREE RIGHT TURN
-  = BUS LANE

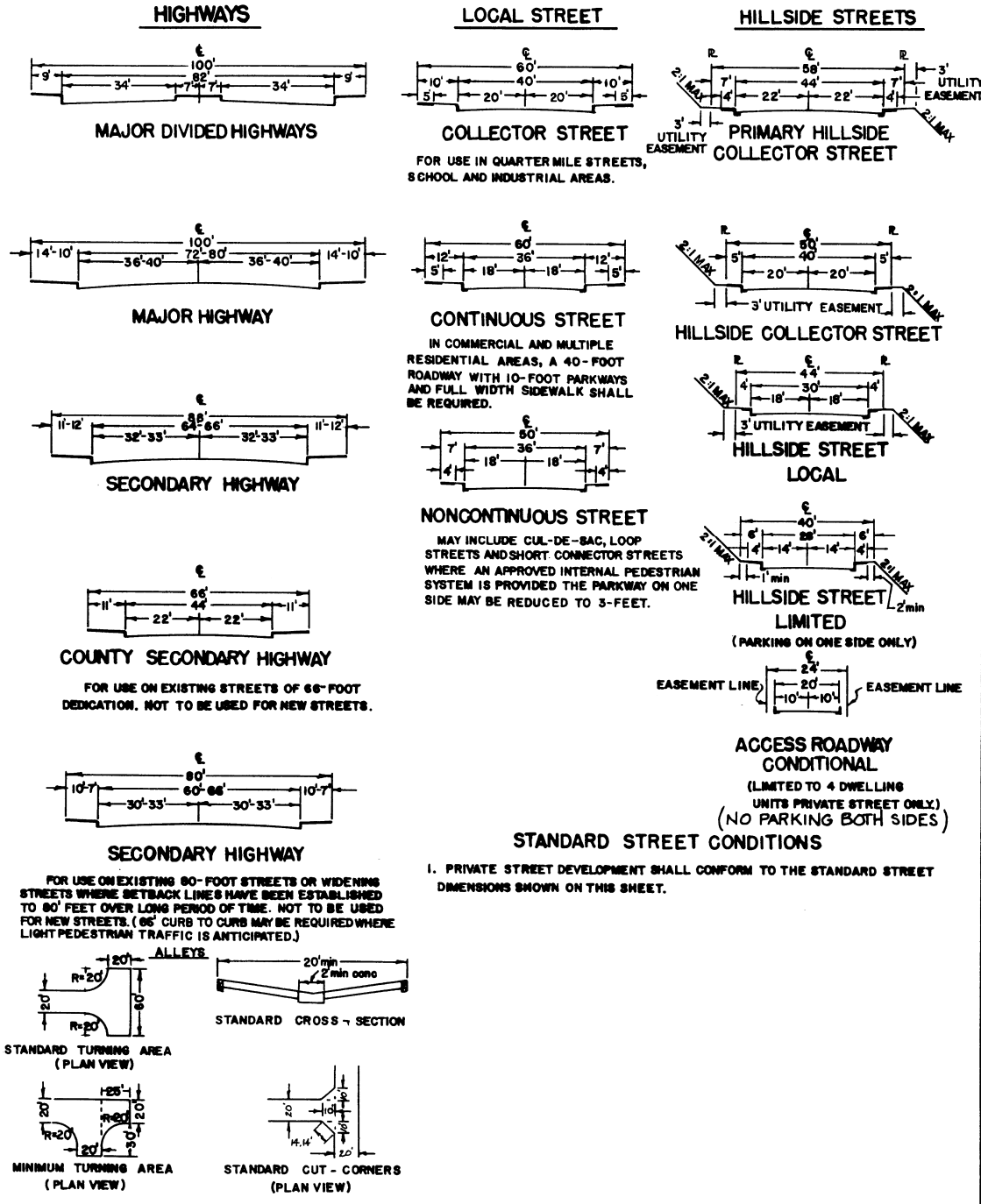
EXHIBIT 3-2: CITY OF SAN BERNARDINO GENERAL PLAN CIRCULATION ELEMENT



- Freeway
- State Highway
- Major Arterial
- Secondary Arterial
- Collector
- Local
- City Boundary
- Sphere of Influence Boundary



EXHIBIT 3-3: CITY OF SAN BERNARDINO GENERAL PLAN ROADWAY CROSS-SECTIONS



3.3 TRANSIT SERVICE

The study area is currently served by Omnitrans, a public transit agency serving various jurisdictions within San Bernardino County, with bus service along E Street via Route 2 the sbX Greenline and along S. Waterman Avenue via Route 5. The existing bus routes provided within the area by Omnitrans are shown on Exhibit 3-4. The sbX Greenline is an existing transit line that currently serves the area in the immediate vicinity of the proposed Project. Transit service is reviewed and updated by Omnitrans periodically to address ridership, budget and community demand needs. Changes in land use can affect these periodic adjustments which may lead to either enhanced or reduced service where appropriate. As such, it is recommended that the applicant work in conjunction with Omnitrans to potentially provide bus service to the site.

3.4 BICYCLE & PEDESTRIAN FACILITIES

Exhibit 3-5 illustrates the City of San Bernardino conceptual trail system, which includes bicycle routes along Orange Show Road, Arrowhead Avenue, and S. Waterman Avenue near the vicinity of the site. There is also a regional multi-purpose trail to the west of the Project site that leads south to the Primary Regional Multi-Purpose Trail (Santa Ana River Trail).

Field observations conducted in March 2017 indicate nominal pedestrian and bicycle activity within the study area. Existing pedestrian facilities within the study area are shown on Exhibit 3-6.

3.5 EXISTING (2017) TRAFFIC COUNTS

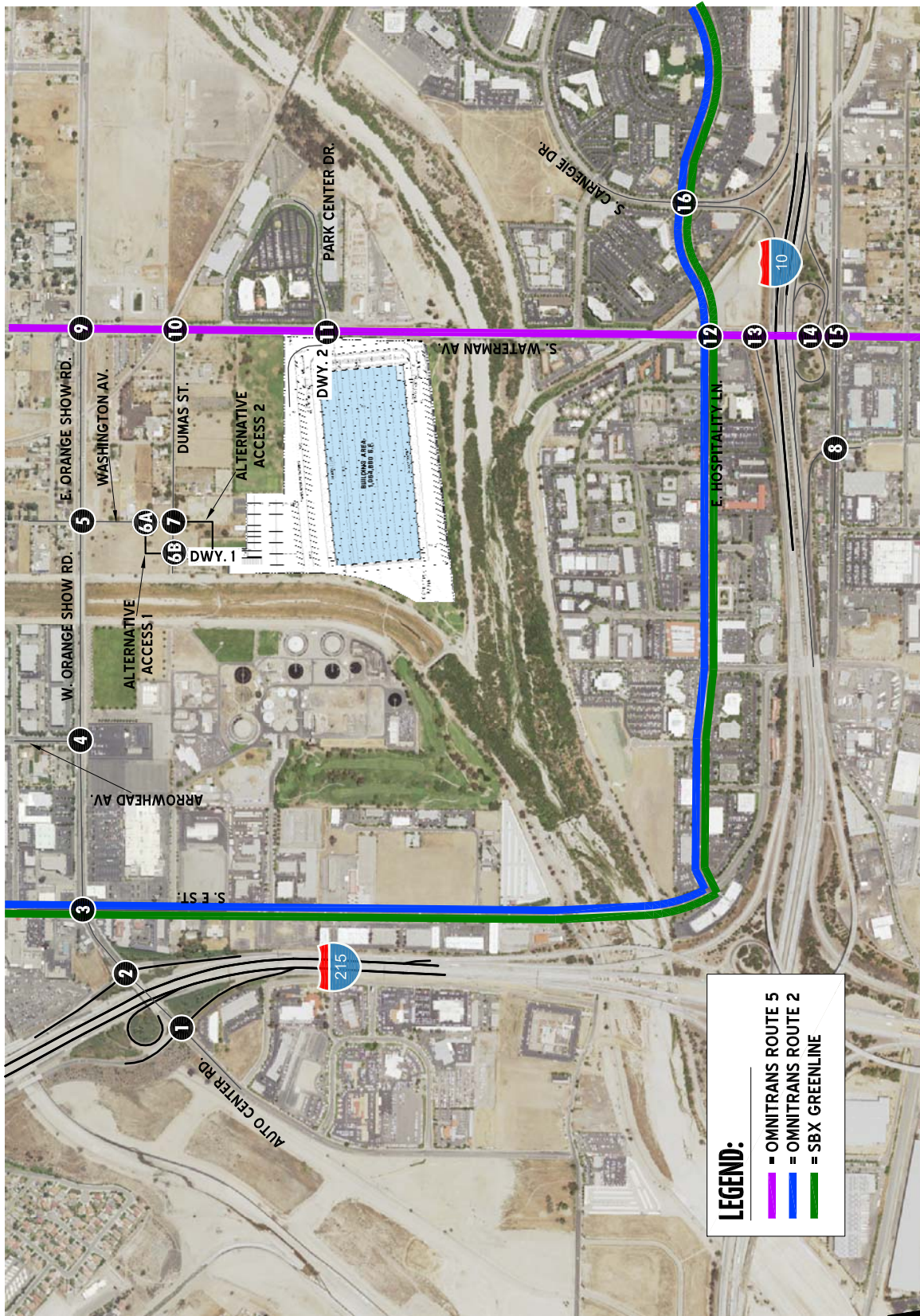
The intersection LOS analysis is based on the traffic volumes observed during the peak hour conditions using traffic count data collected in March 2017. The following peak hours were selected for analysis:

- Weekday AM Peak Hour (peak hour between 7:00 AM and 9:00 AM)
- Weekday PM Peak Hour (peak hour between 4:00 PM and 6:00 PM)

The weekday AM and weekday PM peak hour count data is representative of typical weekday peak hour traffic conditions in the study area. There were no observations made in the field that would indicate atypical traffic conditions on the count dates, such as construction activity or detour routes and near-by schools were in session and operating on normal schedules.

Although there is a second northbound left turn lane at the intersection of E Street and Auto Center Road / Orange Show Road (approximately 250-feet in length), the analysis has been performed assuming a single left turn lane as field review indicates that vehicles headed onto the I-215 Northbound often block the inner left turn lane. As a result, the inner left turn lane does not get adequately utilized each cycle. As such, analysis was performed assuming a single northbound left turn lane during the AM and PM peak hours for all analysis scenarios.

EXHIBIT 3-4: EXISTING TRANSIT ROUTES



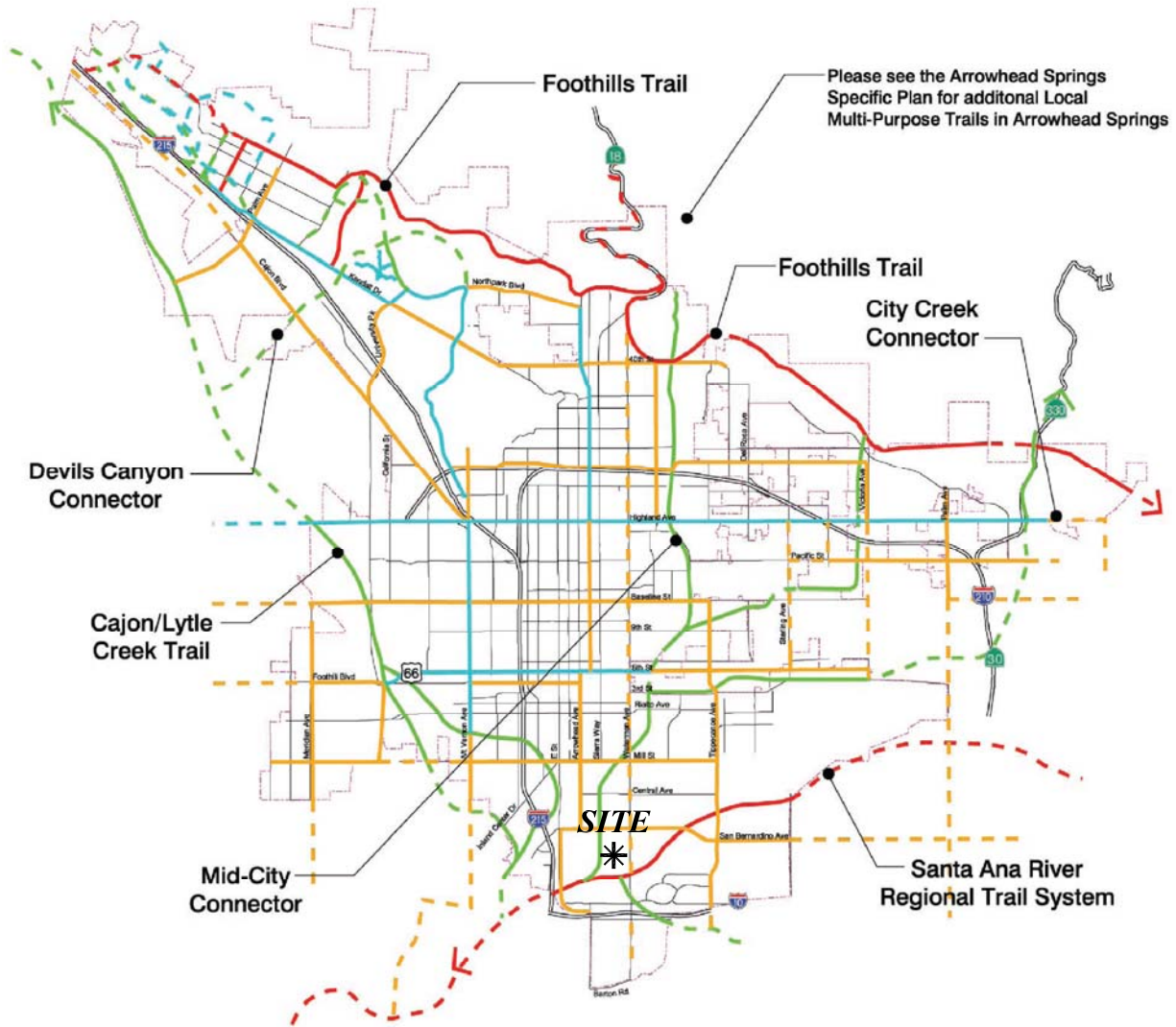
SOURCE: OMNITRANS SYSTEM MAP

LEGEND:

- = OMNITRANS ROUTE 5
- = OMNITRANS ROUTE 2
- = SBX GREENLINE



EXHIBIT 3-5: CITY OF SAN BERNARDINO CONCEPTUAL TRAIL SYSTEM



Proposed or Within Other Jurisdictions Existing Proposed

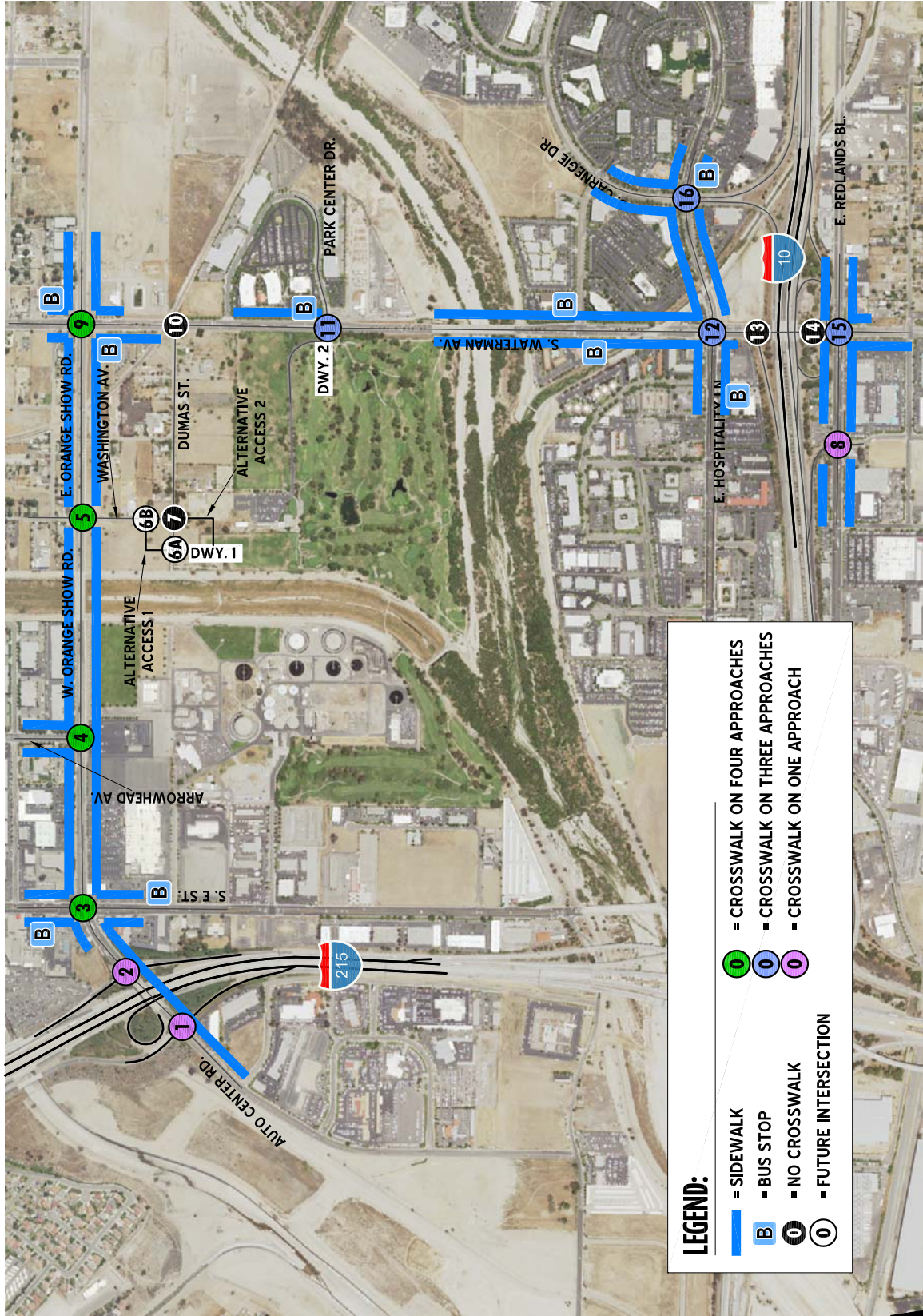


Primary Regional Multi-Purpose Trails
 Regional Multi-Purpose Trails
 Local Multi-Purpose Trails
 Bicycle Routes

 City Boundary



EXHIBIT 3-6: EXISTING PEDESTRIAN FACILITIES



The raw manual peak hour turning movement traffic count data sheets are included in Appendix 3.1. These raw turning volumes have been flow conserved between intersections with limited access, no access and where there are currently no uses generating traffic (e.g., between ramp-to-arterial intersections, etc.).

The traffic counts collected in March 2017 include the following vehicle classifications: include the vehicle classifications as shown below:

- Passenger Cars
- 2-Axle Trucks
- 3-Axle Trucks
- 4 or More Axle Trucks

To represent the impact large trucks, buses and recreational vehicles have on traffic flow; all trucks were converted into passenger car equivalents (PCEs). By their size alone, these vehicles occupy the same space as two or more passenger cars. In addition, the time it takes for them to accelerate and slow-down is also much longer than for passenger cars, and varies depending on the type of vehicle and number of axles. For the purpose of this analysis, a PCE factor of 2.0 has been applied to 2-axle trucks, 2.5 for 3-axle trucks and 3.0 for 4+-axle trucks to estimate each turning movement. These factors are consistent with the City of San Bernardino Traffic Impact Study Guidelines (1). Existing average daily traffic (ADT) volumes on arterial highways throughout the study area are shown on Exhibit 3-7. Existing ADT volumes are based upon factored intersection peak hour counts collected by Urban Crossroads, Inc. using the following formula for each intersection leg:

$$\text{Weekday PM Peak Hour (Approach Volume + Exit Volume)} \times 12.2503 = \text{Leg Volume}$$

For those roadway segments which have 24-hour tube count data available in close proximity to the study area, a comparison between the PM peak hour and daily traffic volumes indicated that the peak-to-daily relationship of approximately 8.16 percent would sufficiently estimate ADT volumes for planning-level analyses. As such, the above equation utilizing a factor of 12.2503 estimates the ADT volumes on the study area roadway segments assuming a peak-to-daily relationship of approximately 8.16 percent (i.e., $1/0.122503 = 8.16$).

Existing weekday AM and PM peak hour intersection volumes are shown on Exhibit 3-8. It should be noted that the traffic volumes shown on Exhibit 3-7 are represented in PCE as opposed to actual vehicles.

3.6 EXISTING (2017) CONDITIONS INTERSECTION OPERATIONS ANALYSIS

Existing peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2.2 *Intersection Capacity Analysis* of this report. The intersection operations analysis results are summarized in Table 3-1 which indicates that the following existing study area intersection is currently operating at an unacceptable LOS during one or more of the peak hours:

- I-10 Westbound Ramps/Carnegie Dr. / Hospitality Lane (#16) – LOS E AM peak hour only

EXHIBIT 3-7: EXISTING (2016) AVERAGE DAILY TRAFFIC (ADT)



EXHIBIT 3-8: EXISTING (2016) TRAFFIC VOLUMES

<p>1 I-215 SB Ramps & Auto Center Rd.</p> <p>344(268) 66(101) 1037(554) 247(617) 188(318)</p> <p>132(438) 33(174)</p>	<p>2 I-215 NB Ramps & Auto Center Rd.</p> <p>249(634) 296(827)</p> <p>69(222) 1100(770)</p> <p>140(116) 8(7) 840(905)</p>	<p>3 S. "E" St. & Auto Center Rd. / W. Orange Show Rd.</p> <p>42(250) 126(260) 42(220) 61(122) 338(826) 59(146)</p> <p>215(230) 1206(1093) 460(344)</p> <p>162(307) 168(374) 113(141)</p>	<p>4 S. Arrowhead Av. & W. Orange Show Rd.</p> <p>192(481) 11(2) 86(183) 84(135) 290(626) 7(10)</p> <p>286(288) 984(1003) 17(4)</p> <p>0(20) 3(9) 5(37)</p>	<p>5 S. Washington Av. & W. Orange Show Rd.</p> <p>7(11) 1(1) 3(1) 12(8) 371(730) 2(4)</p> <p>49(33) 1022(1217) 8(11)</p> <p>6(15) 3(2) 0(5)</p>
<p>6 Washington Av. & Dwy. 1</p> <p>Intersection Does Not Exist</p>	<p>7 Washington Av. & Dumas St.</p> <p>0(0) 12(15) 8(17) 0(0)</p> <p>0(0) 0(0)</p>	<p>8 I-10 EB Ramps & E. Redlands Bl.</p> <p>615(379) 304(123) 580(501) 411(565) 35(21)</p> <p>450(632) 31(17)</p> <p>23(62)</p>	<p>9 S. Waterman Av. & E. Orange Show Rd.</p> <p>64(118) 565(752) 72(139) 84(84) 274(445) 95(75)</p> <p>169(168) 518(855) 325(217)</p> <p>55(208) 469(721) 62(130)</p>	<p>10 S. Waterman Av. & E. Dumas St.</p> <p>8(4) 1022(1012)</p> <p>3(2) 10(11)</p> <p>1(9) 582(1057)</p>
<p>11 S. Waterman Av. & Dwy. 2 / Park Center Dr.</p> <p>5(2) 778(1199) 44(8) 7(32) 1(0) 19(100)</p> <p>0(8) 0(0) 0(20)</p> <p>20(8) 632(1094) 118(16)</p>	<p>12 S. Waterman Av. & E. Hospitality Ln.</p> <p>142(149) 436(970) 90(200) 67(105) 399(450) 359(390)</p> <p>158(168) 183(383) 129(554)</p> <p>284(265) 802(449) 802(687)</p>	<p>13 S. Waterman Av. & I-10 WB Ramps</p> <p>154(684) 772(1313)</p> <p>281(347) 1887(1424)</p>	<p>14 S. Waterman Av. & I-10 EB Ramps</p> <p>124(441) 648(908)</p> <p>1133(675)</p> <p>1035(1130) 300(418)</p>	<p>15 S. Waterman Av. & E. Redlands Bl.</p> <p>179(188) 396(519) 73(201) 104(181) 221(353) 108(169)</p> <p>471(483) 367(654) 233(143)</p> <p>39(51) 760(884) 110(83)</p>
<p>16 S. Carnegie Dr. & E. Hospitality Ln.</p> <p>35(86) 84(533) 15(89) 26(123) 202(421) 84(457)</p> <p>159(115) 350(805) 108(234)</p> <p>655(329) 204(73) 63(72)</p>				

LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES

Table 3-1

Intersection Analysis for Existing (2017) Conditions

#	Intersection	Traffic Control ³	Intersection Approach Lanes ¹												Delay ² (secs.)		Level of Service		v/c ⁵	
			Northbound			Southbound			Eastbound			Westbound			AM	PM	AM	PM	AM	PM
1	I-215 SB Ramps / Auto Center Rd.	TS	0	0	0	1	1	1	0	2	0	0	2	0	18.3	11.9	B	B	--	--
2	I-215 NB Ramps / Auto Center Rd.	TS	1	1	2	0	0	0	1	2	0	0	2	1	18.4	30.7	B	C	--	0.72
3	E St. / Auto Center Rd. / Orange Show Rd. ⁴	TS	1	2	0	2	2	1>	2	2	1	2	2	1>	34.6	43.9	C	D	0.70	0.83
4	Arrowhead Av. / Orange Show Rd.	TS	1	1	0	1	1	1>	1	2	0	1	2	d	24.7	33.9	C	C	0.49	0.54
5	Washington Av. / Orange Show Rd.	TS	0	1	d	0	1	0	1	2	0	1	2	0	4.4	5.5	A	A	--	--
6	Washington Av. / Driveway 1		Intersection Does Not Exist												Intersection Does Not Exist					
7	Washington Av. / Dumas St.	CSS	0	0	0	0	1	0	0	1	0	0	1	0	8.6	8.7	A	A	--	--
8	I-10 EB Ramps / E. Redlands Bl.	TS	0	0	1	1	1	1	0	2	0	1	2	0	29.9	28.7	C	C	0.55	0.49
9	S. Waterman Av. / Orange Show Rd.	TS	1	2	d	1	2	d	1	2	d	1	2	d	39.9	36.9	D	D	0.64	0.87
10	S. Waterman Av. / Dumas St.	CSS	1	2	0	0	2	0	1	0	d	0	0	0	16.3	16.3	C	C	0.01	0.01
11	S. Waterman Av. / Park Center Dr.	TS	1	2	1	1	2	0	0	1	0	0	1	d	6.0	10.8	A	B	--	--
12	S. Waterman Av. / Hospitality Ln.	TS	2	2	2>	1	3	1>	1	2	1	2	2	0	37.5	45.9	D	D	0.65	0.74
13	S. Waterman Av. / I-10 WB On-Ramp	CSS	1	2	0	0	3	0	0	0	0	0	0	0	10.6	14.0	B	B	--	--
14	S. Waterman Av. / I-10 EB Ramps	CSS	0	2	1>>	0	2	0	0	0	0	0	0	1>>	0.0	0.0	A	A	--	--
15	S. Waterman Av. / E. Redlands Bl.	TS	1	2	1	1	2	0	2	2	0	1	2	0	38.5	43.2	D	D	0.66	0.93
16	I-10 WB Ramps/Carnegie Dr. / Hospitality Ln.	TS	1	2	1	1	2	1	1	2	1>	2	2	0	65.0	50.3	E	D	0.53	0.74

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

¹ When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; d = Defacto Right Turn Lane; > = Right Turn Overlap Phasing; >> = Free-Right Turn Lane

2

Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with a traffic signal or all-way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

³ CSS = Cross-street Stop; TS = Traffic Signal

⁴ Although there is a second northbound left turn lane, the analysis has been performed assuming a single left as vehicles headed onto the I-215 Northbound often block the inner left turn lane. As a result, the inner left turn lane does not get adequately utilized each cycle.

⁵ Volume to capacity (v/c) ratio has been reported using the HCM 2000 methodology (as HCM 2010 does not report the overall v/c) for intersections with operating at LOS C or worse, consistent with the City of San Bernardino Traffic Impact Study Guidelines.

Consistent with Table 3-1, a summary of the peak hour intersection LOS for Existing conditions are shown on Exhibit 3-9. The intersection operations analysis worksheets are included in Appendix 3.2 of this TIA.

3.7 EXISTING (2017) CONDITIONS TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants for Existing traffic conditions are based on existing peak hour intersection turning volumes. There are currently no study area intersections that warrant a traffic signal. Existing conditions traffic signal warrant analysis worksheets are provided in Appendix 3.3.

3.8 EXISTING (2017) CONDITIONS OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-215 Freeway at the Auto Center Road, I-10 Freeway at E. Redlands Avenue, and I-10 Freeway at Hospitality Lane interchanges to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially “spill back” onto the I-215 Freeway or I-10 Freeway mainline. Queuing analysis findings are presented in Table 3-2. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline. As shown on Table 3-2, there are no movements that are currently experiencing queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows.

Worksheets for Existing traffic conditions off-ramp queuing analysis are provided in Appendix 3.4.

3.9 EXISTING (2017) CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS

Existing (2017) mainline directional volumes for the AM and PM peak hours are provided on Exhibit 3-10. As shown on Table 3-3, the freeway segments analyzed for this study were found to operate at an acceptable LOS (i.e., LOS D or better) during the peak hours for Existing (2017) traffic conditions, with exception of the following:

- I-10 Westbound, West of Waterman Av. – LOS E both peak hours
- I-10 Westbound, East of Waterman Av. – LOS F PM peak hour only

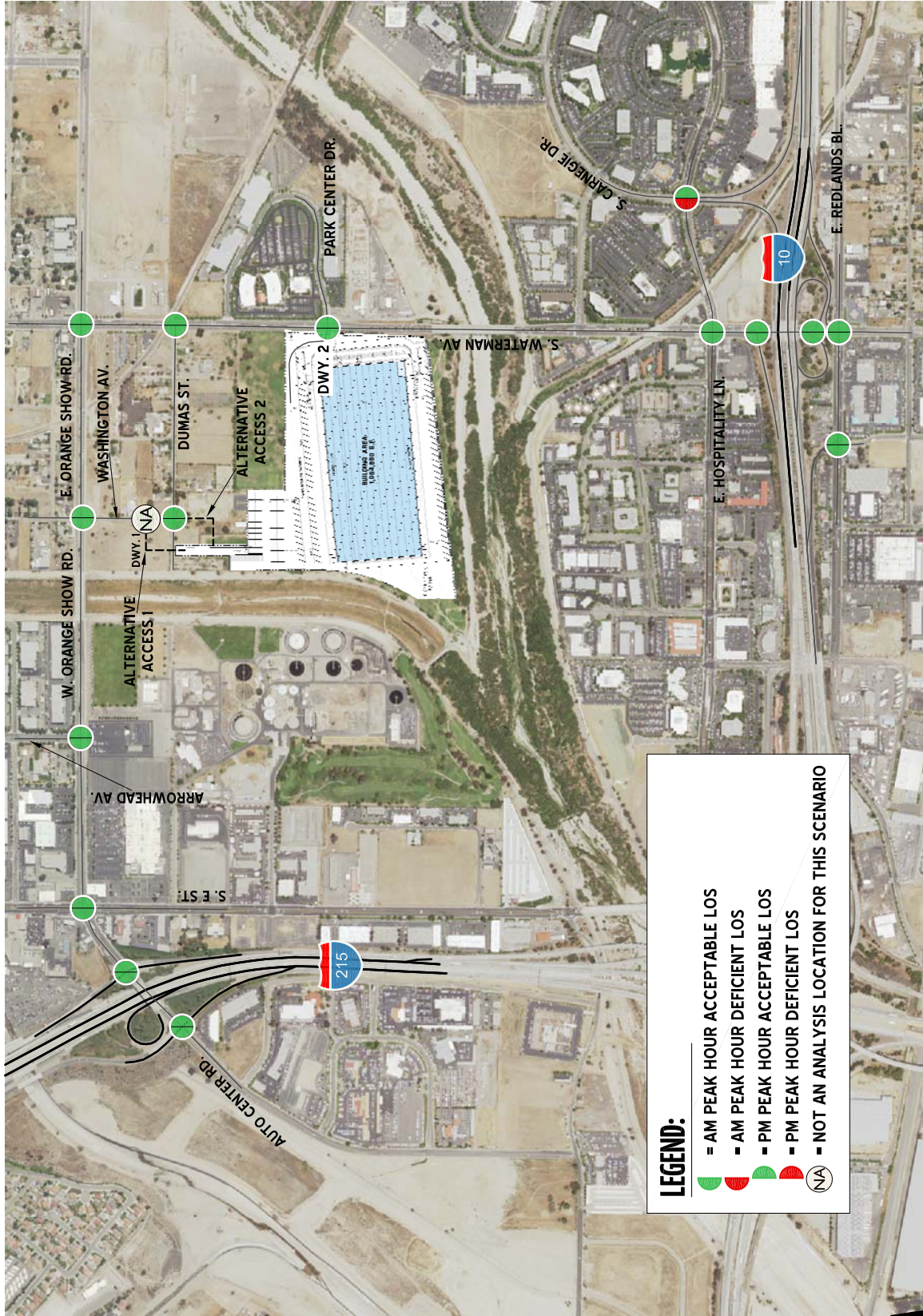
Existing (2017) basic freeway segment analysis worksheets are provided in Appendix 3.5.

3.10 EXISTING (2017) CONDITIONS FREEWAY MERGE/DIVERGE ANALYSIS

As shown in Table 3-4, the merge/diverge areas currently operate at LOS D or better during the peak hours under Existing (2017) traffic conditions.

Existing (2017) freeway ramp junction operations analysis worksheets are provided in Appendix 3.6. Existing freeway mainline volumes are shown on Exhibit 3-10.

EXHIBIT 3-9: EXISTING (2017) SUMMARY OF LOS



LEGEND:

- = AM PEAK HOUR ACCEPTABLE LOS
- = AM PEAK HOUR DEFICIENT LOS
- = PM PEAK HOUR ACCEPTABLE LOS
- = PM PEAK HOUR DEFICIENT LOS
- NA = NOT AN ANALYSIS LOCATION FOR THIS SCENARIO



EXHIBIT 3-10: EXISTING (2017) FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)



LEGEND:

← 100/200 = AM/PM PEAK HOUR VOLUMES

NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)

Table 3-2

Peak Hour Freeway Off-Ramp Queuing Summary for Existing (2017) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	95th Percentile Queue (Feet)		Acceptable? ¹	
			AM Peak	PM Peak	AM	PM
I-215 SB Off-Ramp / Auto Center Rd.	SBL	2,695	368 ²	160	Yes	Yes
	SBL/T	2,230	353 ²	156	Yes	Yes
	SBR	465	41	37	Yes	Yes
I-215 NB Off-Ramp / Auto Center Rd.	NBL	925	54	45	Yes	Yes
	NBL/T	1,050	54	44	Yes	Yes
	NBR	275	273 ²	182	Yes	Yes
I-10 EB Off-Ramp / E. Redlands Bl.	SBL	100	364	302	Yes ³	Yes ³
	SBL/T	845	368	297	Yes	Yes
	SBR	215	323	96	Yes ³	Yes
I-10 WB Off-Ramp / E. Hospitality Ln.	NBL	800	317	190	Yes	Yes
	NBT	1,575	303	346	Yes	Yes
	NBR	160	65	111	Yes	Yes

¹ Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided.

² 95th percentile volume exceeds capacity, queue may be longer

³ Although the 95th percentile queue is anticipated to exceed the available storage for the turn lane, the adjacent through lane has sufficient storage to accommodate any spillover without spilling back and affecting the I-10 Freeway mainline.

Table 3-3

Basic Freeway Segment Analysis for Existing (2017) Conditions

Freeway	Direction	Mainline Segment	Lanes ¹	Existing (2017)							
				Volume		Truck %		Density ²		LOS	
				AM	PM	AM	PM	AM	PM	AM	PM
I-215	NB	North of Auto Center Dr.	4	5,326	6,523	3%	1%	21.2	27.0	C	D
		South of Auto Center Dr.	4	6,934	7,535	2%	2%	29.6	33.8	D	D
	SB	North of Auto Center Dr.	5	6,628	5,471	4%	2%	21.3	17.2	C	B
		South of Auto Center Dr.	5	6,585	8,167	4%	2%	21.1	27.2	C	D
I-10	EB	West of Waterman Av.	4	7,224	6,350	10%	8%	33.6	27.2	D	D
		East of Waterman Av.	5	6,517	6,526	11%	8%	21.7	21.3	C	C
	WB	West of Waterman Av.	4	7,808	7,764	15%	17%	40.4	40.7	E	E
		East of Waterman Av.	4	8,451	7,016	14%	18%	47.6	34.0	F	D

¹ Number of lanes are in the specified direction and is based on existing conditions. No future improvements are currently planned.

² Density is measured by passenger cars per mile per lane (pc/mi/ln).

Table 3-4

Freeway Ramp Junction Merge/Diverge Analysis for Existing (2017) Conditions

Freeway	Direction	Ramp or Segment	Lanes on Freeway ¹	Existing (2017)			
				AM Peak Hour		PM Peak Hour	
				Density ²	LOS	Density ²	LOS
I-215	NB	On-Ramp at Auto Center Drive	4	23.6	C	30.1	D
		Off-Ramp at Auto Center Drive	4	7.9	A	9.9	A
	SB	Off-Ramp at Auto Center Drive	5	28.6	D	24.3	C
		Loop On-Ramp (Upstream) at Auto Center Drive	4	26.4	C	28.3	D
		Loop On-Ramp (Downstream) at Auto Center Drive	5	22.4	C	28.2	D
I-10	EB	Off-Ramp at Waterman Avenue	4	22.9	C	18.4	B
		On-Ramp at Waterman Avenue	4	21.2	C	22.8	C
	WB	On-Ramp at Waterman Avenue	4	25.7	C	30.2	D
		Off-Ramp at Waterman Avenue	4	28.6	D	22.6	C

¹ Number of lanes are in the specified direction and is based on existing conditions. No future improvements are currently planned.

² Density is measured by passenger cars per mile per lane (pc/mi/ln).

3.11 EXISTING (2017) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WITH IMPROVEMENTS

Per City of San Bernardino Traffic Impact Study Guidelines, 2015 Update, measures that will provide an acceptable LOS must be identified for intersections failing under Existing conditions.

(1) These improvements are assumed to be in place for all future scenarios. The intersection operations analysis results and lane geometrics for the intersection of Carnegie Drive and Hospitality Lane with improvements are summarized in Table 3-5.

Intersection analysis worksheets for Existing (2017) conditions with improvements are provided in Appendix 3.7.

Table 3-5

Intersection Analysis for Existing (2017) Conditions With Improvements

#	Intersection	Traffic Control ³	Intersection Approach Lanes ¹												Delay ² (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound			AM	PM	AM	PM
			L	T	R	L	T	R	L	T	R	L	T	R				
16	I-10 WB Ramps/Carnegie Dr. / Hospitality Ln.																	
	- Without Improvements	TS	1	2	1	1	2	1	1	2	1>	2	2	0	65.0	50.3	E	D
	- With Improvements	TS	1	2	1	1	2	1	1	2	1>	2	2	1>	38.1	48.2	D	D

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

¹ When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; d = Defacto Right Turn Lane; > = Right-Turn Overlap Phasing; 1 = Improvement

² Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with a traffic signal or all-way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

³ TS = Traffic Signal

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4 PROJECTED FUTURE TRAFFIC

This section presents the traffic volumes estimated to be generated by the Project, as well as the Project's trip assignment onto the study area roadway network. The Project is proposed to consist of a total of 1,064,880 square feet (sf) of high-cube warehouse/distribution center use. For the purposes of this traffic study, the Project anticipated to be developed in a single phase with an anticipated opening year of 2018.

The Project is proposed to have access on Washington Avenue via Dumas Street and Waterman Avenue via Driveway 2 (western extension of Park Center Drive). All Project access points are assumed to allow for full-access. Regional access to the Project site will be provided by the I-215 Freeway via Orange Show Road, I-10 Freeway via Waterman Road.

4.1 PROJECT TRIP GENERATION

Trip generation represents the amount of traffic which is both attracted to and produced by a development. Determining traffic generation for a specific project is therefore based upon forecasting the amount of traffic that is expected to be both attracted to and produced by the specific land uses being proposed for a given development.

Trip generation rates used to estimate Project traffic are shown in Table 4-1 for actual vehicles and Table 4-2 for PCE. The trip generation rates used for this analysis are based upon information collected by the ITE as provided in their *Trip Generation* manual, 9th Edition, 2012. (4) For purposes of this analysis, ITE land use code 152 (High-Cube Warehousing) has been used to derive site specific trip generation estimates. In order to accurately reflect the impact that heavy trucks would have on the street system, Project trips have been further broken down between passenger cars and trucks for each of the peak hours and weekday daily trip generation. As noted on Table 4-1 and 4-2, refinements to the raw trip generation estimates have been made to provide a more detailed breakdown of trips between passenger cars and trucks. The percentage of trucks has been determined from the table shown on page 267 of the ITE *Trip Generation* manual. As shown on page 267, the truck trip generation rate for weekday daily traffic is 0.64 or 38.1% of the total traffic. Similarly, the truck trip generation rate for the weekday AM peak hour is 0.03 (27.3% of the total traffic) and 0.04 (or 33.3% of the total traffic) for the weekday PM peak hour.

Trip generation for heavy trucks was further broken down by truck type (or axle type). The total truck percentage is comprised of 3 different truck types: 2-axle, 3-axle, and 4+-axle trucks. For the purposes of this analysis, the percentage of trucks, by axle type, were obtained from the South Coast Air Quality Management District's (SCAQMD) interim recommended truck mix. The SCAQMD has recently performed surveys of existing facilities and compiled the data to provide interim guidance on the mix of heavy trucks for these types of high-cube warehousing / distribution facilities. Based on this interim guidance from the SCAQMD, the following truck fleet mix was utilized for the purposes of estimating the truck trip generation for the site: 22.0% of the total trucks as 2-axle trucks, 17.7% of the total trucks as 3-axle trucks, and 60.3% of the total trucks as 4+-axle trucks. Lastly, PCE factors were applied to the trip generation rates for heavy

Table 4-1

Project Trip Generation Summary (Actual Vehicles)

Land Use	Units ²	ITE LU Code	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Trip Generation Rates¹									
High-Cube Warehouse ³	TSF	152	0.076	0.034	0.110	0.037	0.083	0.120	1.680
		Passenger Cars	0.055	0.025	0.080	0.025	0.055	0.080	1.040
		2-Axle Trucks	0.005	0.002	0.007	0.003	0.006	0.009	0.141
		3-Axle Trucks	0.004	0.002	0.005	0.002	0.005	0.007	0.113
		4-Axle+ Trucks	0.012	0.006	0.018	0.007	0.017	0.024	0.386

Land Use	Quantity	Units ²	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Trip Generation Summary									
High-Cube Warehouse	1,064.880	TSF							
Passenger Cars:			59	26	85	26	59	85	1,107
Truck Trips:									
2-axle:			5	2	7	3	6	9	150
3-axle:			4	2	6	2	5	7	121
4+-axle:			13	6	19	8	18	26	411
- Net Truck Trips (Actual Trucks) ³			22	10	32	13	29	42	682
TOTAL NET TRIPS (Actual Vehicles)⁴			81	36	117	39	88	127	1,789

¹ Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, Ninth Edition (2012).

² TSF = thousand square feet

³ Vehicle Mix Source: Total truck percentage source from ITE Trip Generation manual. Truck mix (by axle type) source from SCAQMD.

AM peak hour = 72.7% passenger cars, 6.01% 2-Axle trucks, 4.83% 3-Axle trucks, 16.46% 4-Axle trucks

PM peak hour = 66.7% passenger cars, 7.33% 2-Axle trucks, 5.89% 3-Axle trucks, 20.08% 4-Axle trucks

ADT = 61.9% passenger cars, 8.38% 2-Axle trucks, 6.74% 3-Axle trucks, 22.98% 4-Axle trucks

⁴ TOTAL NET TRIPS (Actual Vehicles) = Passenger Cars + Net Truck Trips (Actual Trucks).

Table 4-2

Project Trip Generation Summary (PCE)

Land Use	Units ²	ITE LU Code	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Trip Generation Rates¹									
High-Cube Warehouse ³	TSF	152	0.076	0.034	0.110	0.037	0.083	0.120	1.680
		Passenger Cars	0.055	0.025	0.080	0.025	0.055	0.080	1.040
		2-Axle Trucks (PCE = 2.0)	0.009	0.004	0.013	0.005	0.012	0.018	0.282
		3-Axle Trucks (PCE = 2.5)	0.009	0.004	0.013	0.005	0.012	0.018	0.283
		4-Axle+ Trucks (PCE = 3.0)	0.037	0.017	0.054	0.022	0.050	0.072	1.158

Land Use	Quantity	Units ²	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Trip Generation Summary									
High-Cube Warehouse	1,064.880	TSF							
Passenger Cars:			59	26	85	26	59	85	1,107
Truck Trips:									
2-axle:			10	4	14	6	13	19	300
3-axle:			10	4	14	6	13	19	301
4+-axle:			40	18	58	24	53	77	1,233
- Net Truck Trips (PCE) ³			60	26	86	36	79	115	1,834
TOTAL NET TRIPS (PCE)⁴			119	52	171	62	138	200	2,941

¹ Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, Ninth Edition (2012).

² TSF = thousand square feet

³ Vehicle Mix Source: Total truck percentage source from ITE Trip Generation manual. Truck mix (by axle type) source from SCAQMD.

AM peak hour = 72.7% passenger cars, 6.01% 2-Axle trucks, 4.83% 3-Axle trucks, 16.46% 4-Axle trucks

PM peak hour = 66.7% passenger cars, 7.33% 2-Axle trucks, 5.89% 3-Axle trucks, 20.08% 4-Axle trucks

ADT = 61.9% passenger cars, 8.38% 2-Axle trucks, 6.74% 3-Axle trucks, 22.98% 4-Axle trucks

⁴ TOTAL NET TRIPS (PCE) = Passenger Cars + Net Truck Trips (PCE).

trucks (large 2-axles, 3-axles, 4+-axles). PCEs allow the typical “real-world” mix of vehicle types to be represented as a single, standardized unit, such as the passenger car, to be used for the purposes of capacity and level of service analyses. The PCE factors are consistent with the recommended PCE factors in the City of San Bernardino Traffic Impact Study Guidelines, 2015 Update. (1) Trip generation rates for actual vehicles and with PCE factors are shown on Table 4-1 and Table 4-2.

As shown on Table 4-2, the proposed Project is anticipated to generate a net total of 2,941 PCE trip-ends per day with 171 net PCE AM peak hour trips and 200 net PCE PM peak hour trips.

4.2 PROJECT TRIP DISTRIBUTION

The Project trip distribution and assignment process represents the directional orientation of traffic to and from the Project site. The trip distribution pattern of passenger cars is heavily influenced by the geographical location of the site, the location of surrounding uses, and the proximity to the regional freeway system. Given these differences, separate trip distributions were generated for both passenger cars and truck trips.

Exhibits 4-1 illustrates the truck trip distribution patterns. Trucks are proposed to have access to both Washington Avenue and S. Waterman Avenue. 2 access alternatives have been evaluated for the purposes of this traffic study: one that assumes an access point off of Washington Avenue, north of Dumas Street, and one that assumes access to Dumas Street at Washington Avenue. Exhibit 4-2 illustrates the passenger car trip distribution patterns. Passenger cars are proposed to utilize only Driveway 2 on S. Waterman Avenue.

4.3 MODAL SPLIT

The potential for Project trips (non-truck) to be reduced by the use of public transit, walking or bicycling have not been included as part of the Project’s estimated trip generation. Essentially, the Project’s traffic projections are "conservative" in that these alternative travel modes would reduce the forecasted traffic volumes (non-truck trips only).

4.4 PROJECT TRIP ASSIGNMENT

The assignment of traffic from the Project area to the adjoining roadway system is based upon the Project trip generation, trip distribution, and the arterial highway and local street system improvements that would be in place by the time of initial occupancy of the Project. Based on the identified Project traffic generation and trip distribution patterns, Project ADT and peak hour intersection turning movement volumes are shown on Exhibits 4-3 and 4-4.

4.5 CONSTRUCTION TRAFFIC

Project construction activities may potentially result in temporary and transient traffic deficiencies related to:

- Construction employee commutes;
- Import of construction materials and soils;

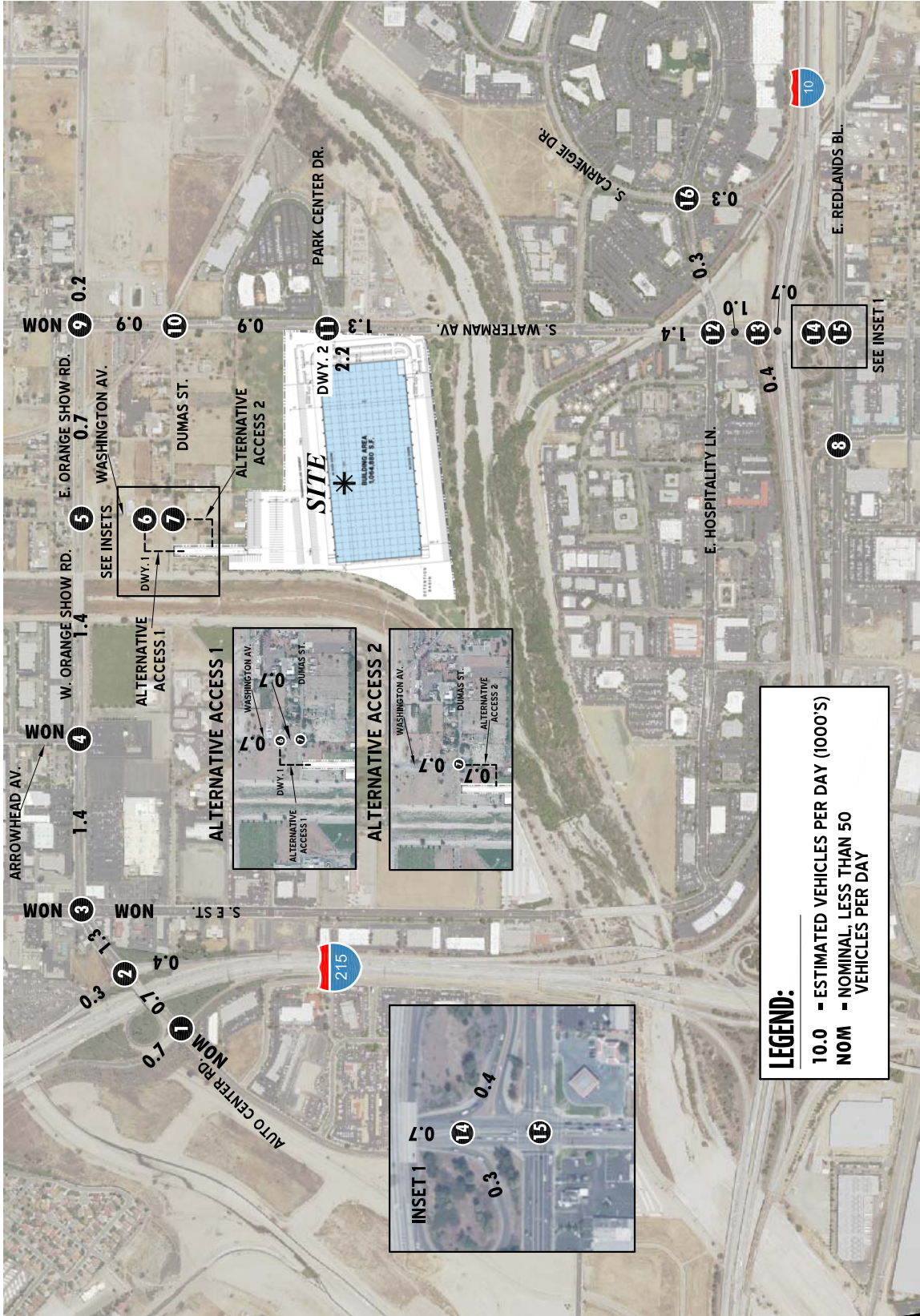
EXHIBIT 4-1: PROJECT (TRUCKS) TRIP DISTRIBUTION



EXHIBIT 4-2: PROJECT (PASSENGER CAR) TRIP DISTRIBUTION



EXHIBIT 4-3: PROJECT ONLY AVERAGE DAILY TRAFFIC (ADT)



LEGEND:
 10.0 - ESTIMATED VEHICLES PER DAY (1000'S)
 NOM - NOMINAL LESS THAN 50 VEHICLES PER DAY



EXHIBIT 4-4: PROJECT ONLY TRAFFIC VOLUMES

1 I-215 SB Ramps & Auto Center Rd.	2 I-215 NB Ramps & Auto Center Rd.	3 S. "E" St. & Auto Center Rd. / W. Orange Show Rd.	4 S. Arrowhead Av. & W. Orange Show Rd.	5 S. Washington Av. & W. Orange Show Rd.

ALTERNATIVE ACCESS 1

6 Washington Av. & Dwy. 1	7 Washington Av. & Dumas St.

ALTERNATIVE ACCESS 2

6 Washington Av. & Dwy. 1	7 Washington Av. & Dumas St.
Not Applicable	

8 I-10 EB Ramps & E. Redlands Bl.	9 S. Waterman Av. & E. Orange Show Rd.	10 S. Waterman Av. & E. Dumas St.	11 S. Waterman Av. & Dwy. 2 / Park Center Dr.	12 S. Waterman Av. & E. Hospitality Ln.

13 S. Waterman Av. & I-10 WB Ramps	14 S. Waterman Av. & I-10 EB Ramps	15 S. Waterman Av. & E. Redlands Bl.	16 S. Carnegie Dr. & E. Hospitality Ln.

LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES

- Transport and use of heavy construction equipment.

The Applicant would be required to develop and implement a City-approved Construction Traffic Management Plan addressing potential construction-related traffic detours and disruptions. In general, the Construction Traffic Management Plan would ensure that to the extent practical, construction traffic would access the Project site during off-peak hours; and that construction traffic would be routed to avoid travel through, or proximate to, sensitive land uses.

4.6 BACKGROUND TRAFFIC

Future year traffic forecasts have been based upon a background (ambient) growth factor of 3% per year. The ambient growth factor is intended to approximate traffic growth. The total ambient growth is 3.0% for 2018 traffic conditions (compounded growth of three percent per year over 1 year). This ambient growth rate is added to existing traffic volumes to account for area-wide growth not reflected by cumulative development projects. Ambient growth has been added to daily and peak hour traffic volumes on surrounding roadways, in addition to traffic generated by the development of future projects that have been approved but not yet built and/or for which development applications have been filed and are under consideration by governing agencies.

Ambient growth has been added to daily and peak hour traffic volumes on surrounding roadways, in addition to traffic generated by the development of future projects that have been approved but not yet built and/or for which development applications have been filed and are under consideration by governing agencies.

The currently adopted Southern California Association of Governments (SCAG) 2016 Regional Transportation Plan (RTP) / Sustainable Communities Strategy (SCS) (April 2016) growth forecasts for the City of San Bernardino identifies projected growth in population of 211,900 in 2012 to 257,400 in 2040, or a 21.47 percent increase over the 28-year period. (5) The change in population equates to roughly a 0.70 percent annual growth rate, compounded annually. Similarly, growth over the same 28-year period in households is projected to increase by 30.02 percent, or a 0.94 percent annual growth rate. Finally, growth in employment over the same 28-year period is projected to increase by 44.99 percent, or a 1.34 percent annual growth rate.

Based on a comparison of Existing traffic volumes to the Horizon Year (2040) forecasts, the average growth rate is estimated at approximately 1.78 percent compounded annually between Existing and Horizon Year (2040) traffic conditions. The annual growth rate at each individual intersection is not lower than 1.09 percent to as high as 3.55 percent compounded annually over the same time period. Therefore, the annual growth rate utilized for the purposes of this analysis would appear to conservatively approximate the anticipated regional growth in traffic volumes in the City of San Bernardino for near term and long range traffic conditions, especially when considered along with the addition of cumulative development project traffic and project-related traffic. As such, the growth in traffic volumes assumed in this traffic impact analysis would tend to overstate, as opposed to understate, the potential impacts to traffic and circulation.

4.7 CUMULATIVE DEVELOPMENT TRAFFIC

California Environmental Quality Act (CEQA) guidelines require that other reasonably foreseeable development projects which are either approved or being processed concurrently in the study area also be included as part of a cumulative analysis scenario. A cumulative project list was developed from a recent traffic study in the City of San Bernardino and information provided by City staff (see Appendix 4.1).

Exhibit 4-5 illustrates the cumulative development location map. A summary of cumulative development projects and their proposed land uses are shown on Table 4-3. If applicable, the traffic generated by individual cumulative projects was manually added to the With Cumulative traffic conditions forecasts to ensure that traffic generated by the listed cumulative development projects in Table 4-3 are reflected as part of the background traffic.

Based on the identified cumulative development project traffic generation and trip distribution patterns, cumulative development ADT volumes are shown on Exhibit 4-6 and cumulative development AM and PM peak hour volumes are shown on Exhibit 4-7.

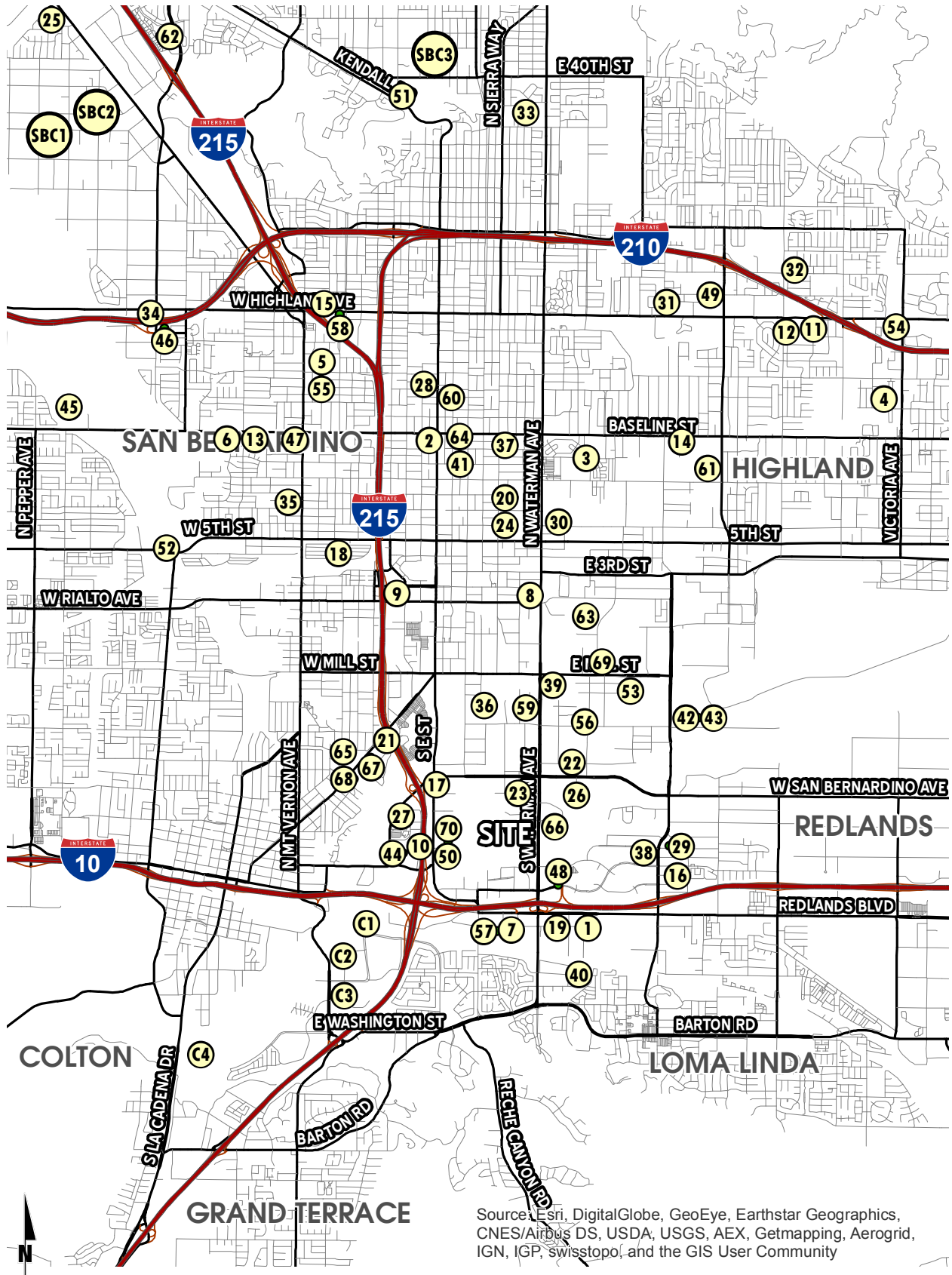
4.8 NEAR-TERM CONDITIONS

The “buildup” approach combines existing traffic counts with a background ambient growth factor to forecast the EA (2018), EAP (2018), EAC (2018), and EAPC (2018) traffic conditions. An ambient growth factor of 3.0% accounts for background (area-wide) traffic increases that occur over time up to the year 2018 from the year 2017 (compounded three percent per year growth over a 1-year period). Project traffic is added to assess EAP (2018) and EAPC (2018) traffic conditions, respectively. Traffic volumes generated by cumulative development projects are then added to assess the EAC (2018) and EAPC (2018) traffic conditions. The 2018 roadway networks are similar to the existing conditions roadway network with the exception of future roadways and intersections proposed to be developed by the Project.

The near-term traffic analysis includes the following traffic conditions, with the various traffic components:

- EA (2018)
 - Existing 2017 PCE volumes
 - Ambient growth traffic (3.0%)
- EAP (2018)
 - Existing 2017 PCE volumes
 - Ambient growth traffic (3.0%)
 - Project Traffic
- EAC (2018)
 - Existing 2017 PCE volumes
 - Ambient growth traffic (3.0%)
 - Cumulative Development Traffic

EXHIBIT 4-5: CUMULATIVE DEVELOPMENT LOCATION MAP



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

EXHIBIT 4-6: CUMULATIVE DEVELOPMENT AVERAGE DAILY TRAFFIC (ADT)



EXHIBIT 4-7: CUMULATIVE DEVELOPMENT TRAFFIC VOLUMES

<p>1 I-215 SB Ramps & Auto Center Rd.</p>	<p>2 I-215 NB Ramps & Auto Center Rd.</p>	<p>3 S. "E" St. & Auto Center Rd. / W. Orange Show Rd.</p>	<p>4 S. Arrowhead Av. & W. Orange Show Rd.</p>	<p>5 S. Washington Av. & W. Orange Show Rd.</p>
<p>6 Washington Av. & Dwy. 1</p>	<p>7 Washington Av. & Dumas St.</p>	<p>8 I-10 EB Ramps & E. Redlands Bl.</p>	<p>9 S. Waterman Av. & E. Orange Show Rd.</p>	<p>10 S. Waterman Av. & E. Dumas St.</p>
<p>11 S. Waterman Av. & Dwy. 2 / Park Center Dr.</p>	<p>12 S. Waterman Av. & E. Hospitality Ln.</p>	<p>13 S. Waterman Av. & I-10 WB Ramps</p>	<p>14 S. Waterman Av. & I-10 EB Ramps</p>	<p>15 S. Waterman Av. & E. Redlands Bl.</p>
<p>16 S. Carnegie Dr. & E. Hospitality Ln.</p>				

LEGEND:
 10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES

Table 4-3

Page 1 of 2

Land Use Summary of Cumulative Development Projects

TAZ	Project Name	Land Use ¹	Quantity	Units ²
City of San Bernardino				
1	ADP 15-49	Urgent Care Center	12.648	TSF
2	CUP 17-02	Car Wash	6.265	TSF
3	CUP 11-13, TTM 18829 & DA12-02	Senior Housing	74	DU
		Multi-Family Housing	337	DU
		Condos	38	DU
4	CUP 12-04	Religious Facility Addition	0.714	TSF
5	CUP 12-06	Commercial Retail	9.180	TSF
		Fast Food w/ Drive Thru	2.400	TSF
6	CUP 12-12	K-6 Charter School	300	STU
7	CUP 12-13	Auditorium, Community Center	20.000	TSF
8	CUP 12-14	Discount Store	9.026	TSF
9	CUP 12-20	Discount Store	10.500	TSF
10	CUP 12-22	Auditorium, Banquet Hall	5.233	TSF
		Restaurant	0.800	TSF
11	CUP 13-01	Discount Store	26.907	TSF
12	CUP 13-07	Discount Store	12.500	TSF
13	CUP 13-14	Gas Station w/ Convenience Market	2.789	TSF
14	CUP 16-07	Car Sales	2.780	TSF
15	CUP 16-10	Used Car Sales	0.644	TSF
16	Raising Cane's (CUP 16-12)	Fast Food w/ Drive Thru	3.823	TSF
17	CUP 16-14	Used Car Sales	6.480	TSF
18	CUP 14-13	Restaurant/Night Club	6.400	TSF
19	MUP 17-02	Auto Repair	9.290	TSF
20	CUP 14-20	Holistic Learning Center	16.266	TSF
21	CUP 16-17	Gas Station w/ Convenience Market	12	VFP
		Car Wash	3.800	TSF
22	Orange Show Road Warehouse	High-Cube Warehouse	342.000	TSF
23	Waterman Industrial Center	High-Cube Warehouse	564.652	TSF
24	CUP 15-02	Gas Station w/ Convenience Market	2.800	TSF
25	CUP 15-03	Two Restaurants w/ Drive Thru	3.000	TSF
26	Alliance California Gateway South	High-Cube Warehouse	1199.360	TSF
27	CUP 16-18	Used Car Sales	7.531	TSF
28	CUP 15-10	Banquet Hall	12.000	TSF
29	CUP 15-12	Restaurant w/ Drive Thru	2.800	TSF
30	CUP 15-14	Gas Station w/ Convenience Market	5.542	TSF
31	CUP 15-17	Charter School	6.832	TSF
32	CUP 15-19	High School Expansion	26.718	TSF
33	CUP 15-20	Hotel	32.000	TSF
34	CUP 16-02	Convenience Market	3.800	TSF
		Drive Thru Car Wash	2.800	TSF
		Restaurant	2.000	TSF
		Gas Station	16	VFP
35	CUP 16-24	Religious Facility	15.340	TSF
36	National Orange Show Industrial	High-Cube Warehouse	616.000	TSF
		General Light Industrial	57.750	TSF
		Warehousing	78.960	TSF
37	CUP 16-08	Car Dealership/Auto Repair	1.37	AC

Table 4-3

Page 2 of 2

Land Use Summary of Cumulative Development Projects

TAZ	Project Name	Land Use ¹	Quantity	Units ²
38	CUP 17-03	Starbucks w/Drive Thru	2.260	TSF
		Gas Station w/Convenience Market and Car Wash	6	VFP
39	DP2 12-02	Warehousing	345.802	TSF
40	DP2 12-03	Automobile Parts and Service Center	24.953	TSF
41	DP-D16-23	Dental Office	2.682	TSF
42	DP2 12-10	General Light Industrial	480.570	TSF
43	DP2 12-14	General Light Industrial	871.900	TSF
44	DP2 12-18	Automobile Dealership	30.300	TSF
45	DP-D13-01	Shipping Container Storage Yard	12.0	AC
46	DP-D13-02	Discount Store	12.406	TSF
47	DP-D13-05	Commercial Retail	9.180	TSF
48	DP-D14-17	Restaurant	11.300	TSF
49	CUP 16-26	Preschool	7.680	TSF
50	DP-D15-03	Recreational Facility	33.600	TSF
51	CUP 16-29	Veterinary Hospital	7.660	TSF
52	CUP 17-04	Storage Yard w/Steel Fabrication	5.000	TSF
53	DP-D15-06	Industrial Building	202.000	TSF
		Industrial Building	177.000	TSF
54	CUP 17-08	Motel	30	RM
55	DP-D16-20	Commercial	5.164	TSF
56	DP-D15-09	Industrial Building	154.560	TSF
57	DP-D15-12	Office Building	153.077	TSF
58	CUP 17-05	Gas Station w/Convenience Market and Car Wash	8	VFP
59	DP-D15-14	Industrial Building	127.327	TSF
60	DP-P16-07	Mixed Use	1.276	TSF
		Residential	1.448	TSF
61	DP-D16-06	Commercial Building Expansion	44.190	TSF
62	DP-D16-07	Building	32.000	TSF
63	DP-P16-04	Apartment	38	DU
64	DP-P14-06	Commercial Building	5.200	TSF
65	DP-P14-07	Senior Housing	82	DU
66	DP-D16-22	Warehouse	14.202	TSF
67	DP-P15-01	Industrial Park	94.965	TSF
68	DP-P15-04	Industrial Building	14.857	TSF
69	DP-D16-24	Industrial Building	476.632	TSF
70	DP-D16-27	Office Building	43.953	TSF
City of Colton				
C1	Steel Road/Santa Ana	Industrial Park	159.276	TSF
C2	Pacific Rail - Metal Shredder	Metal Shredder	1	MS
C3	Education/Office Building	General Office	114.071	TSF
C4	Soil Safe Land Improvement Project	Soil Safe Project	19	AC
San Bernardino County				
SBC1	DP2 12-09	Industrial Park	1,789.990	TSF
SBC2	DP-D15-13	Industrial Building	337.000	TSF
SBC3	CUP 16-15	Self-Storage Facility	91.500	TSF

¹ SFDR = Single Family Detached Residential

² DU = Dwelling Units; TSF = Thousand Square Feet; STU = Students; VFP = Vehicle Fueling Positions; MS = Metal Shredder

- EAPC (2018)
 - Existing 2017 PCE volumes
 - Ambient growth traffic (3.0%)
 - Cumulative Development traffic
 - Project Traffic

4.9 HORIZON YEAR (2040) VOLUME DEVELOPMENT

Traffic projections for Horizon Year (2040) Without Project conditions were derived from the SBTAM using accepted procedures for model forecast refinement and smoothing. The traffic forecasts reflect the area-wide growth anticipated between Existing conditions and Horizon Year traffic conditions. In most instances the traffic model zone structure is not designed to provide accurate turning movements along arterial roadways unless refinement and reasonableness checking is performed. Therefore, the Horizon Year peak hour forecasts were refined using the model derived long-range forecasts, base (validation) year model forecasts, along with existing peak hour traffic count data. The SBTAM has a base (validation) year of 2012 and a horizon (future forecast) year of 2040. The difference in model volumes (2040-2012) defines the growth in traffic over the 28-year period.

The refined future peak hour approach and departure volumes obtained from the model output data are then entered into a spreadsheet program consistent with the National Cooperative Highway Research Program (NCHRP Report 255), along with initial estimates of turning movement proportions. A linear programming algorithm is used to calculate individual turning movements which match the known directional roadway segment forecast volumes computed in the previous step. This program computes a likely set of intersection turning movements from intersection approach counts and the initial turning proportions from each approach leg.

The future Horizon Year peak hour turning movements were then reviewed by Urban Crossroads, Inc. for reasonableness, and in some cases, were adjusted to achieve reasonable growth for 2040 traffic conditions. The result of this traffic forecasting procedure is a series of traffic volumes which are suitable for traffic operations analysis.

The Project only traffic forecasts have been generated by applying the trip generation, distribution and traffic assignment calculations. Project traffic volumes were then added to the refined future year volumes to determine Horizon Year (2040) With Project traffic conditions. Flow conservation checks and forecast adjustments were performed as necessary to ensure that all future traffic volume forecasts are reasonable and to ensure the flow of traffic volumes between closely spaced intersections is maintained. In order words, traffic flow between two closely spaced intersections, such as two freeway ramp locations, is verified in order to make certain that vehicles leaving one intersection are entering the adjacent intersection and that there is no unexplained loss of vehicles. The result of this traffic forecasting procedure is a series of traffic volumes which are suitable for traffic operations analysis.

Post-processing worksheets for Horizon Year (2040) with Project traffic conditions are provided in Appendix 4.2.

5 E+P TRAFFIC CONDITIONS

This section discusses the traffic forecasts for Existing plus Project (E+P) conditions and the resulting intersection operations and traffic signal warrant analyses.

5.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for E+P conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the Project driveways and those facilities assumed to be in place prior to or constructed by the Project to provide site access are also assumed to be in place for E+P conditions.

5.2 E+P TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus Project traffic. Exhibit 5-1 shows the weekday ADT and Exhibit 5-2 shows the weekday peak hour volumes which can be expected for E+P traffic conditions.

5.3 E+P CONDITIONS INTERSECTION OPERATIONS ANALYSIS

E+P peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2 *Methodologies* of this TIA. The intersection analysis results are summarized in Table 5-1 and shown on Exhibit 5-3, which indicates that there are no additional study area intersections anticipated to operate at unacceptable LOS for E+P conditions, in addition to the intersection previously identified under Existing traffic conditions. The addition of Project traffic is not anticipated to result in a significant impact based on the City's significance threshold.

The intersection operations analysis worksheets for E+P traffic conditions are included in Appendix 5.1 of this TIA.

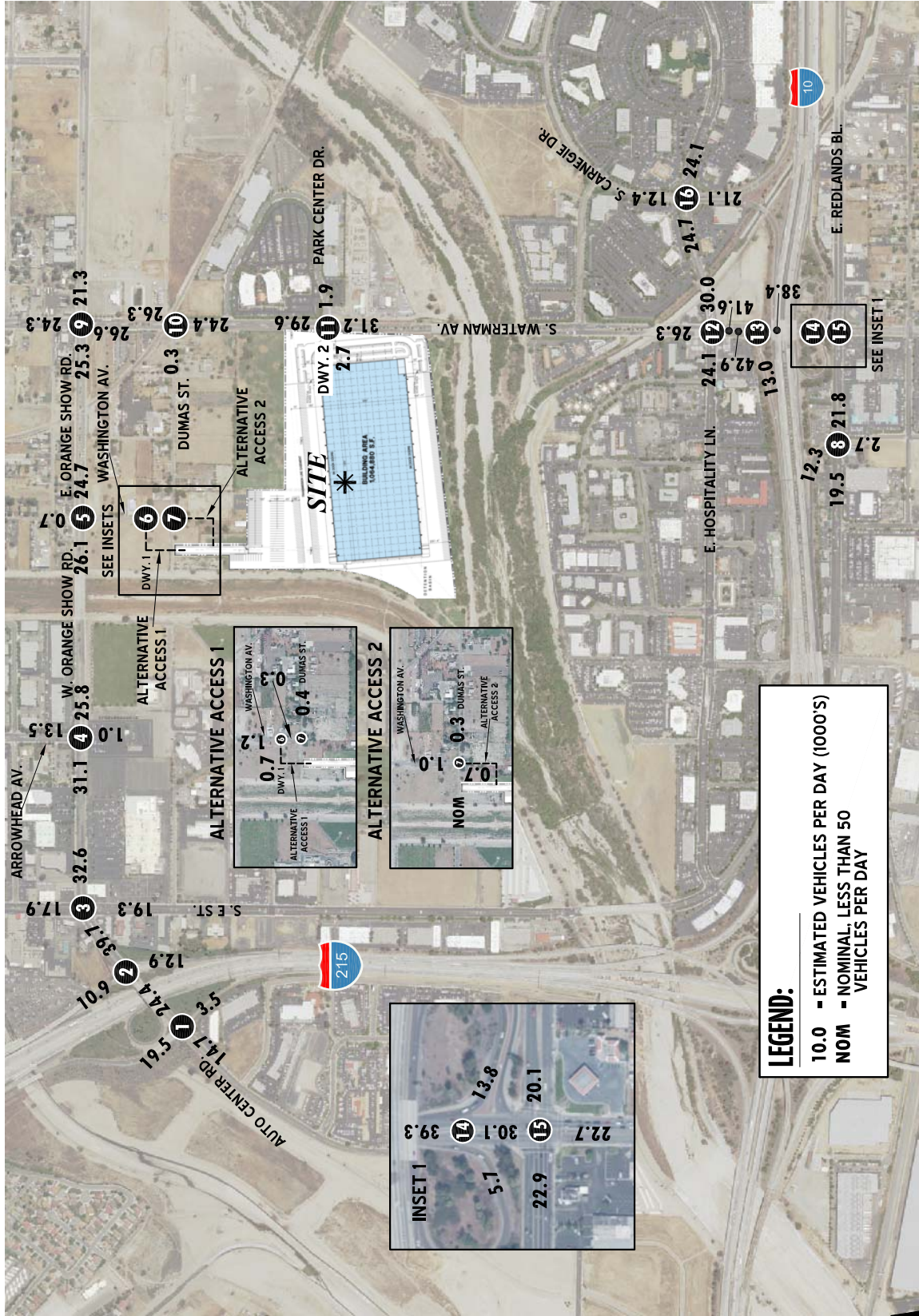
5.4 E+P CONDITIONS TRAFFIC SIGNAL WARRANTS ANALYSIS

There are no traffic signals anticipated to meet peak hour volume based on planning level (Caltrans) ADT traffic signal warrants with the addition of Project traffic (see Appendix 5.2).

5.5 E+P CONDITIONS OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-215 Freeway and Auto Center Road, I-10 Freeway and E. Redlands Boulevard, and I-10 Freeway and Hospitality Lane interchanges to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially "spill back" onto the I-215 Freeway or I-10 Freeway mainline. Queuing analysis findings are presented in Table 5-2 for E+P traffic conditions. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline.

EXHIBIT 5-1: E+P AVERAGE DAILY TRAFFIC (ADT)



LEGEND:
 10.0 - ESTIMATED VEHICLES PER DAY (1000'S)
 NOM - NOMINAL LESS THAN 50 VEHICLES PER DAY



EXHIBIT 5-2: E+P TRAFFIC VOLUMES

1 I-215 SB Ramps & Auto Center Rd.	2 I-215 NB Ramps & Auto Center Rd.	3 S. "E" St. & Auto Center Rd. / W. Orange Show Rd.	4 S. Arrowhead Av. & W. Orange Show Rd.	5 S. Washington Av. & W. Orange Show Rd.
↓ 344(268) ↓ 66(101) ↓ 1,061(566) ← 259(650) ← 189(320)	← 259(662) ← 309(862)	↓ 42(250) ↓ 126(260) ↓ 44(221) ← 62(124) ← 361(888) ← 60(147)	↓ 192(481) ↓ 11(2) ↓ 87(184) ← 85(136) ← 315(691) ← 7(10)	↓ 7(11) ↓ 1(1) ↓ 3(1) ← 12(8) ← 386(765) ← 2(4)
134(439) → 33(174) →	69(222) → 1,126(783) →	215(230) → 1,260(1,121) → 460(344) →	286(288) → 1,041(1,032) → 17(4) →	49(33) → 1,056(1,232) → 32(25) →
	140(116) ↑ 8(7) ↑ 868(920) ↑	162(307) ↑ 168(374) ↑ 114(142) ↑	0(20) ↑ 3(9) ↑ 5(37) ↑	16(47) ↑ 3(2) ↑ 0(5) ↑

ALTERNATIVE ACCESS 1

6 Washington Av. & Dwy. 1	7 Washington Av. & Dumas St.
↓ 24(14) ↓ 12(10)	↓ 0(0) ↓ 12(15) ← 8(17) ← 0(0)
10(32) → 0(0) →	0(0) → 0(0) →
0(0) ↑ 6(14) ↑	0(0) ↑ 0(0) ↑

ALTERNATIVE ACCESS 2

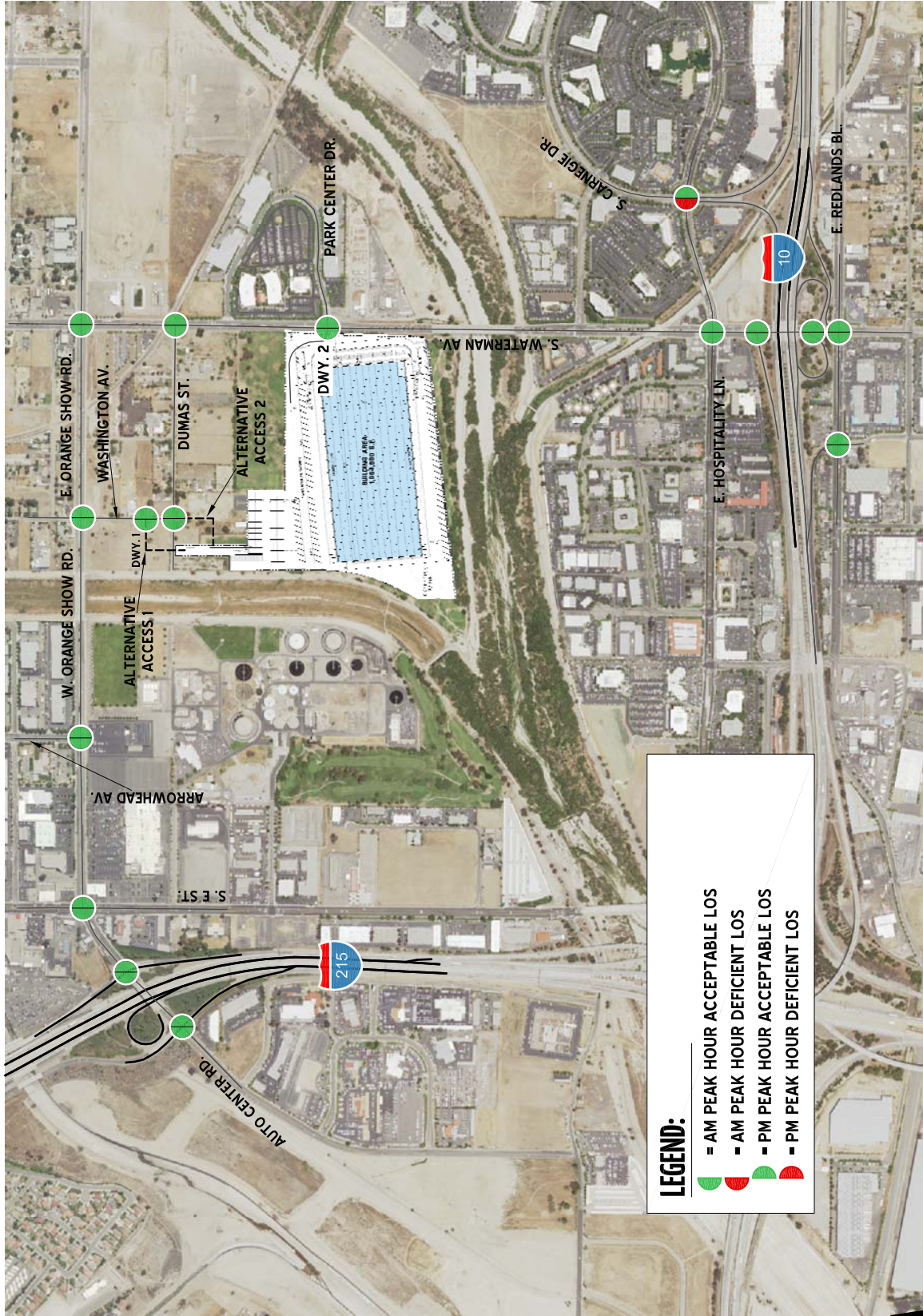
6 Washington Av. & Dwy. 1	7 Washington Av. & Dumas St.
Not Applicable	↓ 0(0) ↓ 24(14) ↓ 12(10) ← 8(15) ← 0(3) ← 0(0)
	0(0) → 0(0) → 0(0) →
	0(0) ↑ 10(32) ↑ 0(0) ↑

8 I-10 EB Ramps & E. Redlands Bl.	9 S. Waterman Av. & E. Orange Show Rd.	10 S. Waterman Av. & E. Dumas St.	11 S. Waterman Av. & Dwy. 2 / Park Center Dr.	12 S. Waterman Av. & E. Hospitality Ln.
↓ 615(379) ↓ 304(123) ↓ 580(501) ← 411(565) ← 35(21)	↓ 64(118) ↓ 567(753) ↓ 72(139) ← 84(84) ← 274(445) ← 104(79)	↓ 8(4) ↓ 1,066(1,032) ← 3(2) ← 10(11)	↓ 49(22) ↓ 778(1,199) ↓ 44(8) ← 7(32) ← 1(0) ← 19(100)	↓ 148(166) ↓ 452(976) ↓ 90(200) ← 91(118) ← 399(450) ← 359(390)
450(632) → 31(17) →	169(168) → 518(855) → 359(232) →	3(2) → 10(11) →	20(53) → 0(0) → 22(81) →	158(168) → 183(383) → 129(554) →
	23(62) ↑	70(243) ↑ 470(723) ↑ 66(139) ↑	1(9) ↑ 602(1,102) ↑	71(36) ↑ 332(1,094) ↑ 118(16) ↑
13 S. Waterman Av. & I-10 WB Ramps	14 S. Waterman Av. & I-10 EB Ramps	15 S. Waterman Av. & E. Redlands Bl.	16 S. Carnegie Dr. & E. Hospitality Ln.	
↓ 160(701) ↓ 782(1,342)	↓ 134(470) ↓ 648(908) ← 1,160(690)	↓ 179(188) ↓ 396(519) ↓ 73(201) ← 104(181) ← 221(353) ← 108(169)	↓ 35(86) ↓ 84(533) ↓ 15(89) ← 26(123) ← 202(421) ← 84(457)	
281(347) → 1,914(1,439) →	1,035(1,130) → 300(418) →	471(483) → 367(654) → 233(143) →	159(115) → 350(805) → 114(250) →	
	39(51) ↑ 760(884) ↑ 110(83) ↑	679(342) ↑ 204(73) ↑ 63(72) ↑		

LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES

EXHIBIT 5-3: E+P SUMMARY OF LOS



LEGEND:

- AM PEAK HOUR ACCEPTABLE LOS
- AM PEAK HOUR DEFICIENT LOS
- PM PEAK HOUR ACCEPTABLE LOS
- PM PEAK HOUR DEFICIENT LOS



Table 5-1

Intersection Analysis for E+P Conditions

#	Intersection	Traffic Control ²	Existing (2017)						E+P						Change in v/c ⁶		Significant Impact ⁵
			Delay ¹ (secs.)		LOS ⁷		Average v/c ³		Delay ¹ (secs.)		LOS ⁷		Average v/c ³		AM	PM	
			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	
1	I-215 SB Ramps / Auto Center Rd.	TS	18.3	11.9	B	B	--	--	19.2	12.0	B	B	--	--	--	--	No
2	I-215 NB Ramps / Auto Center Rd.	TS	18.4	30.7	B	C	--	0.72	20.4	30.8	C	C	0.76	0.75	--	0.03	No
3	E St. / Auto Center Rd. / Orange Show Rd. ⁴	TS	34.6	43.9	C	D	0.70	0.83	40.1	45.5	D	D	0.72	0.85	0.02	0.02	No
4	Arrowhead Av. / Orange Show Rd.	TS	24.7	33.9	C	C	0.49	0.54	33.8	37.3	C	D	0.50	0.57	0.01	0.03	No
5	Washington Av. / Orange Show Rd.	TS	4.4	5.5	A	A	--	--	5.3	7.4	A	A	--	--	--	--	No
6	Washington Av. / Driveway 1	CSS	Intersection Does Not Exist						8.7	8.8	A	A	--	--	--	--	No
7	Washington Av. / Dumas St.	CSS	8.6	8.7	A	A	--	--	8.6	8.7	A	A	--	--	--	--	No
	<i>Alternative Access:</i>	CSS	Not Applicable						9.1	9.4	A	A	--	--	--	--	No
8	I-10 EB Ramps / E. Redlands Bl.	TS	29.9	28.7	C	C	0.55	0.49	29.9	28.7	C	C	0.55	0.49	0.00	0.00	No
9	S. Waterman Av. / Orange Show Rd.	TS	39.9	34.5	D	C	0.64	0.87	41.1	35.3	D	D	0.64	0.90	0.00	0.03	No
10	S. Waterman Av. / Dumas St.	CSS	16.3	16.3	C	C	0.01	0.01	16.6	16.4	C	C	0.01	0.01	0.00	0.00	No
11	S. Waterman Av. / Park Center Dr.	TS	6.0	10.8	A	B	--	--	9.1	14.8	A	B	--	--	--	--	No
12	S. Waterman Av. / Hospitality Ln.	TS	37.5	45.9	D	D	0.65	0.74	37.9	45.9	D	D	0.66	0.74	0.01	0.00	No
13	S. Waterman Av. / I-10 WB On-Ramp	CSS	10.6	14.0	B	B	--	--	10.6	14.0	B	B	--	--	--	--	No
14	S. Waterman Av. / I-10 EB Ramps	CSS	0.0	0.0	A	A	--	--	0.0	0.0	A	A	--	--	--	--	No
15	S. Waterman Av. / E. Redlands Bl.	TS	38.5	43.2	D	D	0.66	0.93	38.5	43.2	D	D	0.66	0.93	0.00	0.00	No
16	I-10 WB Ramps/Carnegie Dr. / Hospitality Ln.	TS	38.1	48.2	D	D	0.51	0.74	38.2	48.3	D	D	0.52	0.74	0.01	0.00	No

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

¹ Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with a traffic signal or all-way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

² CSS = Cross-street Stop; TS = Traffic Signal; **CSS** = Improvement

³ Volume to capacity (v/c) ratio has been reported using the HCM 2000 methodology (as HCM 2010 does not report the overall v/c) for intersections operating at LOS C or worse, consistent with the City of San Bernardino Traffic Impact Study Guidelines.

⁴ Although there is a second northbound left turn lane, the analysis has been performed assuming a single left as vehicles headed onto the I-215 Northbound often block the inner left turn lane. As a result, the inner left turn lane does not get adequately utilized each cycle.

⁵ Significant impact has been identified if the change in v/c exceeds the applicable thresholds per the City of San Bernardino Traffic Impact Study Guidelines

⁶ The TIA Guidelines have significance criteria based on v/c difference for LOS C or worse. As such, difference in v/c has not been reported for LOS "A" or LOS "B".

⁷ LOS = Level of Service

Table 5-2

Peak Hour Freeway Off-Ramp Queuing Summary for E+P Conditions

Intersection	Movement	Available Stacking Distance (Feet)	Existing (2017)				E+P			
			95th Percentile Queue (Feet)		Acceptable? ¹		95th Percentile Queue (Feet)		Acceptable? ¹	
			AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
I-215 SB Off-Ramp / Auto Center Rd.	SBL	2,695	368 ²	160	Yes	Yes	381 ²	161	Yes	Yes
	SBL/T	2,230	353 ²	156	Yes	Yes	366 ²	163	Yes	Yes
	SBR	465	41	37	Yes	Yes	41	37	Yes	Yes
I-215 NB Off-Ramp / Auto Center Rd.	NBL	925	54	45	Yes	Yes	54	45	Yes	Yes
	NBL/T	1,050	54	44	Yes	Yes	54	44	Yes	Yes
	NBR	275	273	182 ⁰	Yes	Yes	292 ²	197 ²	Yes	Yes
I-10 EB Off-Ramp / E. Redlands Bl.	SBL	100	364	302	Yes ³	Yes ³	364	302	Yes ³	Yes ³
	SBL/T	845	368	297	Yes	Yes	368	297	Yes	Yes
	SBR	215	323	96	Yes ³	Yes	323	96	Yes ³	Yes
I-10 WB Off-Ramp / E. Hospitality Ln.	NBL	800	317	190	Yes	Yes	329	196	Yes	Yes
	NBT	1,575	303	346	Yes	Yes	303	346	Yes	Yes
	NBR	160	65	111	Yes	Yes	65	111	Yes	Yes

¹ Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

² 95th percentile volume exceeds capacity, queue may be longer

³ Although the 95th percentile queue is anticipated to exceed the available storage for the turn lane, the adjacent through lane has sufficient storage to accommodate any spillover without spilling back and affecting the I-10 Freeway mainline.

As shown on Table 5-2, consistent with Existing traffic conditions, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for E+P traffic conditions. Worksheets for E+P traffic conditions off-ramp queuing analysis are provided in Appendix 5.3.

5.6 E+P CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS

E+P mainline directional volumes for the AM and PM peak hours are provided on Exhibit 5-4. As shown on Table 5-3, there are no additional freeway segments anticipated to operate at an unacceptable LOS (i.e., LOS D or better) during the peak hours for E+P traffic conditions, in addition to those listed under Existing conditions.

E+P basic freeway segment analysis worksheets are provided in Appendix 5.4.

5.7 E+P CONDITIONS FREEWAY MERGE/DIVERGE ANALYSIS

As shown in Table 5-4, the merge/diverge areas operate at LOS D or better during the peak hours under E+P traffic conditions.

E+P freeway ramp junction operations analysis worksheets are provided in Appendix 5.5. Existing freeway mainline volumes are shown on Exhibit 5-4.

Table 5-3

Basic Freeway Segment Analysis for E+P Conditions

Freeway	Direction	Mainline Segment	Lanes ¹	Existing (2017)						Existing plus Project									
				Volume		Truck %		Density ²		LOS		Volume		Truck %		Density ²		LOS	
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
I-215	NB	North of Auto Center Dr.	4	5,326	6,523	3%	1%	21.2	27.0	3%	1%	21.3	27.1	3%	1%	21.3	27.1	C	D
	SB	South of Auto Center Dr.	4	6,934	7,535	2%	2%	29.6	33.8	2%	2%	29.6	33.8	2%	2%	30.0	33.9	D	D
I-10	WB	West of Waterman Av.	5	6,628	5,471	4%	2%	21.3	17.2	4%	2%	21.3	17.2	4%	2%	21.3	17.2	C	B
	EB	East of Waterman Av.	5	6,585	8,167	4%	2%	21.1	27.2	4%	2%	21.1	27.2	4%	3%	21.1	27.5	C	D
I-10	WB	West of Waterman Av.	4	7,224	6,350	10%	8%	33.6	27.2	10%	8%	33.6	27.2	10%	8%	33.8	27.3	D	D
	EB	East of Waterman Av.	5	6,517	6,526	11%	8%	21.7	21.3	11%	8%	21.7	21.3	11%	8%	21.7	21.5	C	C
I-10	WB	West of Waterman Av.	4	7,808	7,764	15%	17%	40.4	40.7	15%	17%	40.4	40.7	15%	17%	40.5	40.9	E	E
	EB	East of Waterman Av.	4	8,451	7,016	14%	18%	47.6	34.0	14%	18%	47.6	34.0	14%	18%	47.9	34.1	F	D

¹ Number of lanes are in the specified direction and is based on existing conditions. No future improvements are currently planned.

² Density is measured by passenger cars per mile per lane (pc/mi/ln).

Table 5-4

Freeway Ramp Junction Merge/Diverge Analysis for E+P Conditions

Freeway	Direction	Ramp or Segment	Lanes on Freeway ¹	Existing (2017)				Existing plus Project			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Density ²	LOS	Density ²	LOS	Density ²	LOS	Density ²	LOS
I-215	NB	On-Ramp at Auto Center Drive	4	23.6	C	30.1	D	23.7	C	30.4	D
		Off-Ramp at Auto Center Drive	4	7.9	A	9.9	A	7.9	A	9.9	A
	SB	Off-Ramp at Auto Center Drive	5	28.6	D	24.3	C	28.7	D	24.4	C
		Loop On-Ramp (Upstream) at Auto Center Drive	4	26.4	C	28.3	D	26.6	C	28.6	D
		Loop On-Ramp (Downstream) at Auto Center Drive	5	22.4	C	28.2	D	22.5	C	28.6	D
I-10	EB	Off-Ramp at Waterman Avenue	4	22.9	C	18.4	B	23.1	C	18.5	B
		On-Ramp at Waterman Avenue	4	21.2	C	22.8	C	21.3	C	23.1	C
	WB	On-Ramp at Waterman Avenue	4	25.7	C	30.2	D	25.7	C	30.3	D
		Off-Ramp at Waterman Avenue	4	28.6	D	22.6	C	28.8	D	22.7	C

¹ Number of lanes are in the specified direction and is based on existing conditions. No future improvements are currently planned.

² Density is measured by passenger cars per mile per lane (pc/mi/ln).

EXHIBIT 5-4: E+P FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)



LEGEND:

← 100/200 = AM/PM PEAK HOUR VOLUMES
NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)

6 EA (2018) AND EAP (2018) TRAFFIC CONDITIONS

This section discusses the traffic forecasts for EA (2018) and EAP (2018) conditions and the resulting intersection operations and traffic signal warrant analyses.

6.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for EA (2018) and EAP (2018) conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the Project driveways and those facilities assumed to be in place prior to or constructed by the Project to provide site access are also assumed to be in place for EAP (2018) conditions.

6.2 EA (2018) TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus an ambient growth factor of 3.0%. The weekday ADT, weekday AM, and PM peak hour volumes which can be expected for EA (2018) traffic conditions are shown on Exhibit 6-1 and Exhibit 6-2.

6.3 EAP (2018) TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus an ambient growth factor of 3.0% and the addition of Project traffic. The weekday ADT, weekday AM, and PM peak hour volumes which can be expected for EAP (2018) traffic conditions are shown on Exhibit 6-3 and Exhibit 6-4.

6.4 EA AND EAP (2018) INTERSECTION OPERATIONS ANALYSIS

EA and EAP (2018) peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2 *Methodologies* of this TIA. The intersection analysis results are summarized in Table 6-1 for both EA and EAP (2018) conditions.

6.4.1 EA (2018) CONDITIONS

There are no study area intersections that are anticipated to operate at an unacceptable LOS during the peak hours under EA (2018) conditions. Consistent with Table 6-1, a summary of the peak hour intersection LOS for EA (2018) conditions are shown on Exhibit 6-5. The intersection operations analysis worksheets for EA (2018) traffic conditions are included in Appendix 6.1 of this TIA.

6.4.2 EAP (2018) CONDITIONS

The intersection analysis results indicate that the addition of Project traffic is not anticipated to result in any LOS deficiencies for EAP (2018) conditions. Consistent with Table 6-1, a summary of the peak hour intersection LOS for EAP (2018) conditions are shown on Exhibit 6-6. The intersection operations analysis worksheets for EAP (2018) traffic conditions are included in Appendix 6.2 of this TIA.

EXHIBIT 6-1: EA (2018) AVERAGE DAILY TRAFFIC (ADT)

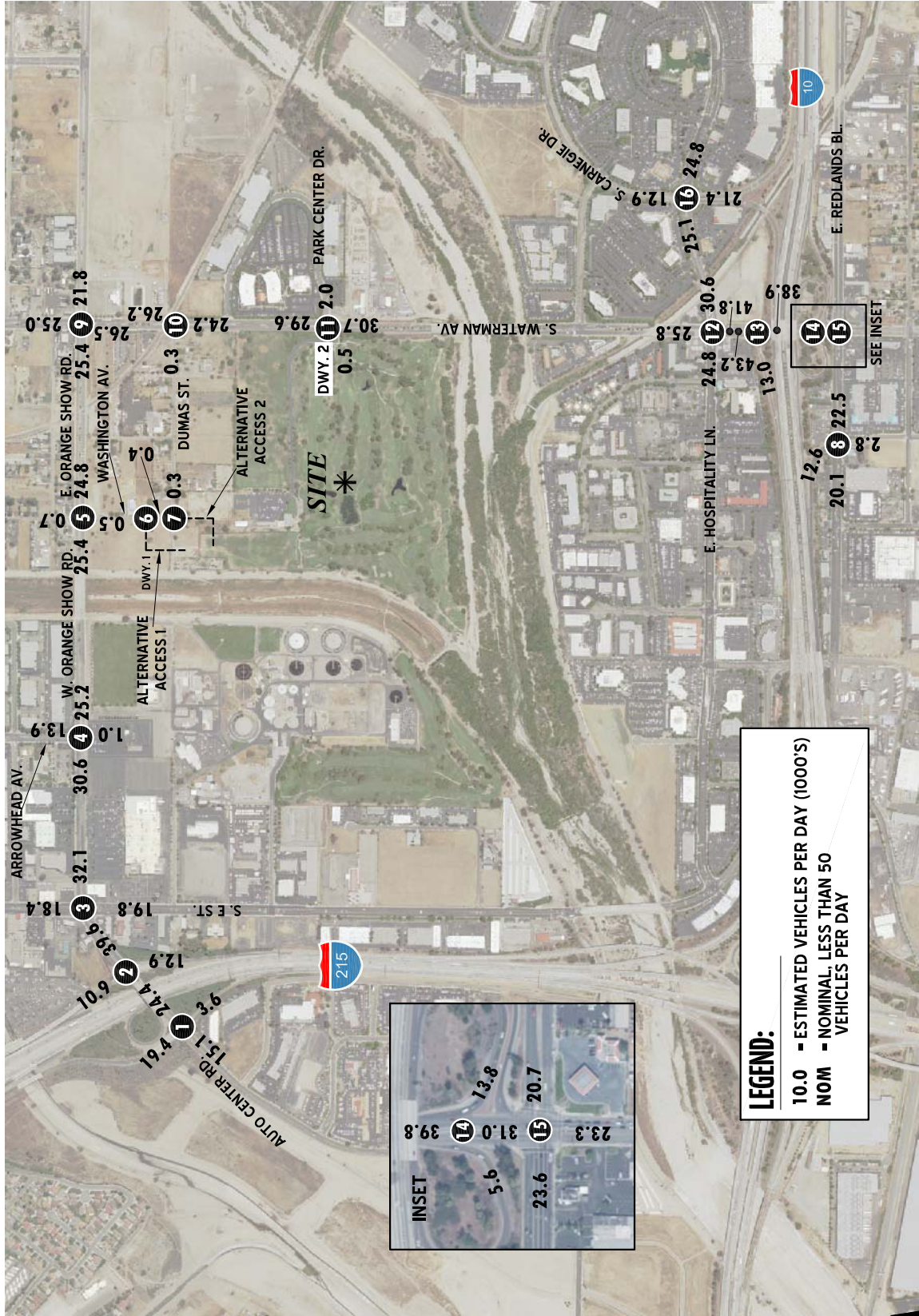


EXHIBIT 6-2: EA (2018) TRAFFIC VOLUMES

<p>1 I-215 SB Ramps & Auto Center Rd.</p> <p>136(451) → 34(179) →</p>	<p>2 I-215 NB Ramps & Auto Center Rd.</p> <p>71(229) → 1132(793) →</p>	<p>3 S. "E" St. & Auto Center Rd. / W. Orange Show Rd.</p> <p>221(237) → 1242(1126) → 474(354) →</p>	<p>4 S. Arrowhead Av. & W. Orange Show Rd.</p> <p>294(297) → 013(1033) → 18(4) →</p>	<p>5 S. Washington Av. & W. Orange Show Rd.</p> <p>50(34) → 1053(1254) → 8(11) →</p>
<p>6 Washington Av. & Dwy. 1</p> <p>Intersection Does Not Exist</p>	<p>7 Washington Av. & Dumas St.</p> <p>0(0) → 0(0) →</p>	<p>8 I-10 EB Ramps & E. Redlands Bl.</p> <p>464(651) → 32(18) →</p>	<p>9 S. Waterman Av. & E. Orange Show Rd.</p> <p>174(173) → 534(881) → 334(223) →</p>	<p>10 S. Waterman Av. & E. Dumas St.</p> <p>3(2) → 10(11) →</p>
<p>11 S. Waterman Av. & Dwy. 2 / Park Center Dr.</p> <p>0(8) → 0(0) → 0(21) →</p>	<p>12 S. Waterman Av. & E. Hospitality Ln.</p> <p>163(173) → 188(394) → 132(571) →</p>	<p>13 S. Waterman Av. & I-10 WB Ramps</p> <p>289(357) → 1944(1466) →</p>	<p>14 S. Waterman Av. & I-10 EB Ramps</p> <p>1066(1164) → 309(431) →</p>	<p>15 S. Waterman Av. & E. Redlands Bl.</p> <p>485(497) → 378(674) → 240(147) →</p>
<p>16 S. Carnegie Dr. & E. Hospitality Ln.</p> <p>164(118) → 360(829) → 111(241) →</p>				

LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES

EXHIBIT 6-3: EAP (2018) AVERAGE DAILY TRAFFIC (ADT)

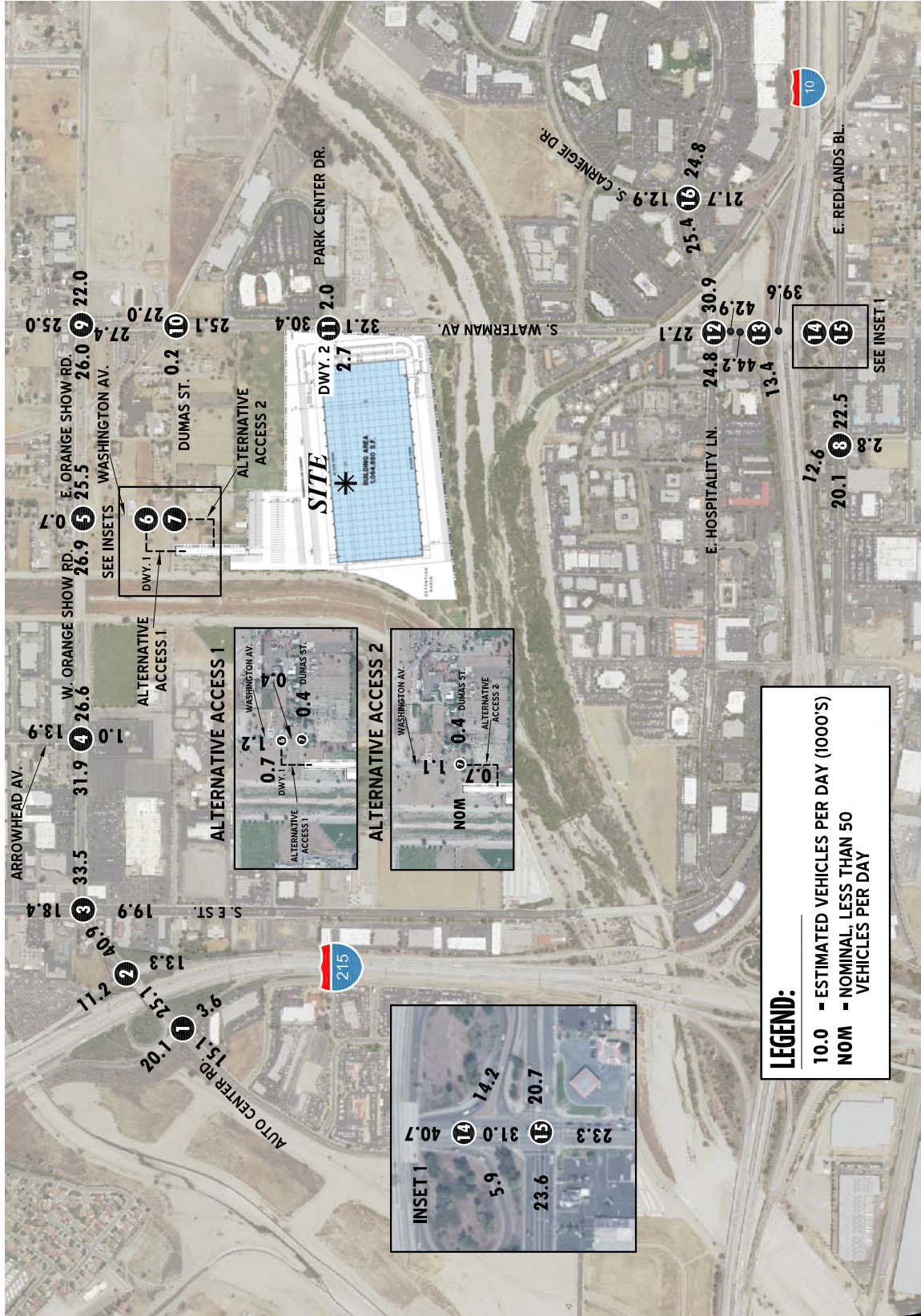


EXHIBIT 6-4: EAP (2018) TRAFFIC VOLUMES

<p>1 I-215 SB Ramps & Auto Center Rd.</p> <p>138(452) 34(179)</p>	<p>2 I-215 NB Ramps & Auto Center Rd.</p> <p>71(229) 1,158(806)</p>	<p>3 S. "E" St. & Auto Center Rd. / W. Orange Show Rd.</p> <p>221(237) 1,296(1,154) 474(354)</p>	<p>4 S. Arrowhead Av. & W. Orange Show Rd.</p> <p>294(297) 1,070(1,062) 18(4)</p>	<p>5 S. Washington Av. & W. Orange Show Rd.</p> <p>50(34) 1,087(1,269) 32(25)</p>
--	--	---	--	--

ALTERNATIVE ACCESS 1

<p>6 Washington Av. & Dwy. 1</p> <p>10(32) 0(0)</p>	<p>7 Washington Av. & Dumas St.</p> <p>0(0) 0(0)</p>
--	---

ALTERNATIVE ACCESS 2

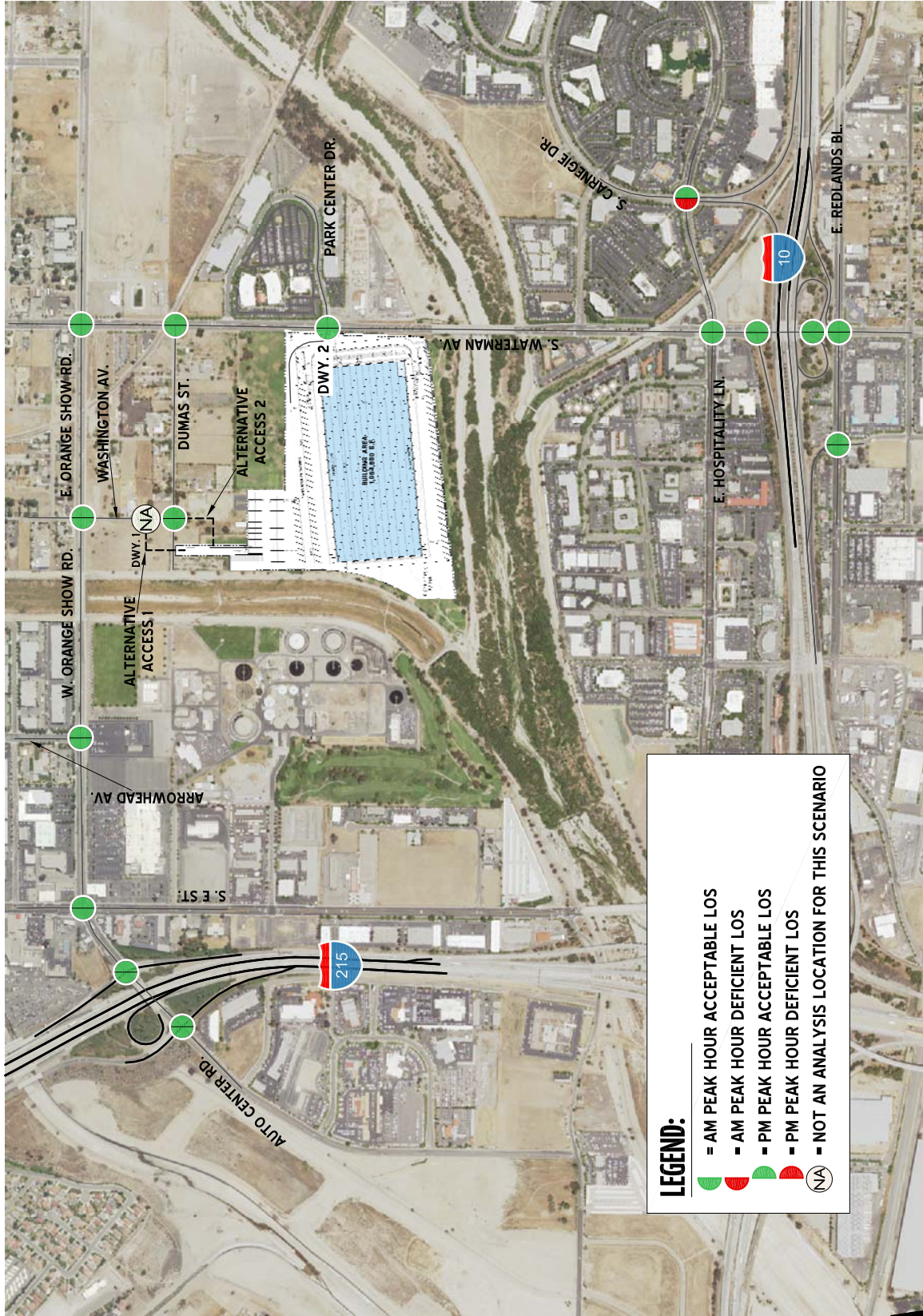
<p>6 Washington Av. & Dwy. 1</p> <p style="text-align: center;">Not Applicable</p>	<p>7 Washington Av. & Dumas St.</p> <p>0(0) 0(0) 0(0)</p>
--	--

<p>8 I-10 EB Ramps & E. Redlands Bl.</p> <p>464(651) 32(18)</p>	<p>9 S. Waterman Av. & E. Orange Show Rd.</p> <p>174(173) 534(881) 368(238)</p>	<p>10 S. Waterman Av. & E. Dumas St.</p> <p>3(2) 10(11)</p>	<p>11 S. Waterman Av. & Dwy. 2 / Park Center Dr.</p> <p>20(53) 0(0) 22(82)</p>	<p>12 S. Waterman Av. & E. Hospitality Ln.</p> <p>163(173) 188(394) 132(571)</p>
<p>13 S. Waterman Av. & I-10 WB Ramps</p> <p>289(357) 1,971(1,481)</p>	<p>14 S. Waterman Av. & I-10 EB Ramps</p> <p>1,066(1,164) 309(431)</p>	<p>15 S. Waterman Av. & E. Redlands Bl.</p> <p>485(497) 378(674) 240(147)</p>	<p>16 S. Carnegie Dr. & E. Hospitality Ln.</p> <p>164(118) 360(829) 117(257)</p>	

LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES

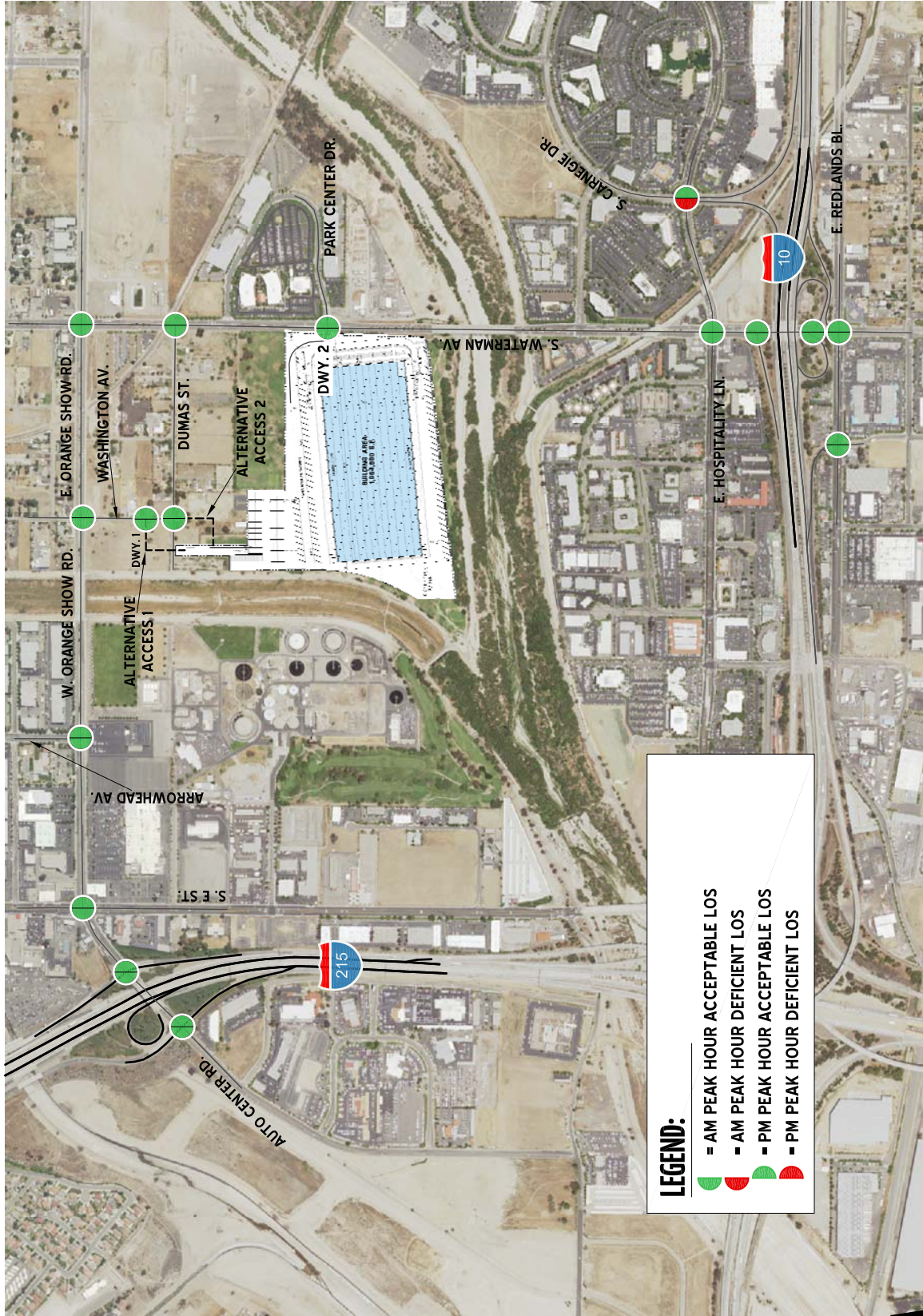
EXHIBIT 6-5: EA (2018) SUMMARY OF LOS



LEGEND:

- = AM PEAK HOUR ACCEPTABLE LOS
- = AM PEAK HOUR DEFICIENT LOS
- = PM PEAK HOUR ACCEPTABLE LOS
- = PM PEAK HOUR DEFICIENT LOS
- NA = NOT AN ANALYSIS LOCATION FOR THIS SCENARIO

EXHIBIT 6-6: EAP (2018) SUMMARY OF LOS



LEGEND:

- AM PEAK HOUR ACCEPTABLE LOS
- AM PEAK HOUR DEFICIENT LOS
- PM PEAK HOUR ACCEPTABLE LOS
- PM PEAK HOUR DEFICIENT LOS



Table 6-1

Intersection Analysis for EA and EAP (2018) Conditions

#	Intersection	Traffic Control ²	EA (2018)						EAP (2018)						Δ v/c		Significant Impact? ⁵	
			Delay ¹ (secs.)		LOS ⁷		Average v/c ^{3,b}		Delay ¹ (secs.)		LOS ⁷		Average v/c ³		Difference ⁶			
			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM		AM
1	I-215 SB Ramps / Auto Center Rd.	TS	19.4	12.1	B	B	--	--	20.5	12.1	C	B	0.50	--	--	--	--	No
2	I-215 NB Ramps / Auto Center Rd.	TS	20.2	32.4	C	C	0.76	0.75	22.8	32.2	C	C	0.78	0.77	0.02	0.02	0.02	No
3	E St. / Auto Center Rd. / Orange Show Rd. ⁴	TS	38.6	45.2	D	D	0.72	0.86	45.4	47.3	D	D	0.74	0.87	0.02	0.01	0.02	No
4	Arrowhead Av. / Orange Show Rd.	TS	33.9	34.7	C	C	0.50	0.57	34.6	39.3	C	D	0.52	0.59	0.02	0.02	0.02	No
5	Washington Av. / Orange Show Rd.	TS	4.4	5.6	A	A	--	--	5.4	7.5	A	A	--	--	--	--	--	No
6	Washington Av. / Driveway 1	CSS	Intersection Does Not Exist						8.7	8.8	A	A	--	--	--	--	--	No
7	Washington Av. / Dumas St.	CSS	8.6	8.7	A	A	--	--	8.6	8.7	A	A	--	--	--	--	--	No
	<i>Alternative Access:</i>	CSS	Not Applicable						9.1	9.4	A	A	--	--	--	--	--	No
8	I-10 EB Ramps / E. Redlands Bl.	TS	30.9	29.4	C	C	0.57	0.50	30.9	29.4	C	C	0.57	0.50	0.00	0.00	0.00	No
9	S. Waterman Av. / Orange Show Rd.	TS	40.5	34.9	D	C	0.66	0.89	41.8	43.8	D	D	0.66	0.92	0.00	0.03	0.00	No
10	S. Waterman Av. / Dumas St.	CSS	16.3	16.4	C	C	0.01	0.01	17.4	16.7	C	C	0.01	0.01	0.00	0.00	0.00	No
11	S. Waterman Av. / Park Center Dr.	TS	6.2	11.2	A	B	--	--	9.3	15.6	A	B	--	--	--	--	--	No
12	S. Waterman Av. / Hospitality Ln.	TS	38.0	47.1	D	D	0.67	0.75	38.4	47.2	D	D	0.67	0.75	0.00	0.00	0.00	No
13	S. Waterman Av. / I-10 WB On-Ramp	CSS	10.7	14.2	B	B	--	--	10.7	14.4	B	B	--	--	--	--	--	No
14	S. Waterman Av. / I-10 EB Ramps	CSS	0.0	0.0	A	A	--	--	0.0	0.0	A	A	--	--	--	--	--	No
15	S. Waterman Av. / E. Redlands Bl.	TS	40.1	46.4	D	D	0.68	0.96	40.1	46.4	D	D	0.68	0.96	0.00	0.00	0.00	No
16	I-10 WB Ramps/Carnegie Dr. / Hospitality Ln.	TS	38.6	50.5	D	D	0.53	0.76	38.7	50.6	D	D	0.54	0.76	0.01	0.00	0.00	No

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

¹ Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with a traffic signal or all-way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

² CSS = Cross-street Stop; TS = Traffic Signal; **CSS** = Improvement

³ Volume to capacity ratio has been reported using the HCM 2000 methodology (as HCM 2010 does not report the overall v/c) for intersections operating at LOS C or worse, consistent with the City of San Bernardino Traffic Impact Study Guidelines.

⁴ Although there is a second northbound left turn lane, the analysis has been performed assuming a single left as vehicles headed onto the I-215 Northbound often block the inner left turn lane. As a result, the inner left turn lane does not get adequately utilized each cycle.

⁵ Significant impact has been identified if the change in v/c exceeds the applicable thresholds per the City of San Bernardino Traffic Impact Study Guidelines

⁶ The TIA Guidelines have significance criteria based on v/c difference for LOS C or worse. As such, v/c ratios and difference in v/c have not been reported for LOS "A" or LOS "B".

⁷ LOS = Level of Service

6.5 EA AND EAP (2018) TRAFFIC SIGNAL WARRANTS ANALYSIS

No study area intersections are anticipated to meet traffic signal warrants for either EA (2018) or EAP (2018) traffic conditions (see Appendix 6.3 and 6.4).

6.6 EA AND EAP (2018) OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-215 Freeway and Auto Center Drive, I-10 Freeway and E. Redlands Boulevard, and I-10 Freeway and Hospitality Lane interchanges to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially “spill back” onto the I-215 Freeway and I-10 Freeway mainline. Queuing analysis findings are presented in Table 6-2 for EA (2018) and EAP (2018) traffic conditions. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline. As shown on Table 6-2, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for either EA (2018) or EAP (2018) traffic conditions.

Worksheets for EA (2018) conditions off-ramp queuing analysis are provided in Appendix 6.5. Worksheets for EAP (2018) conditions off-ramp queuing analysis are provided in Appendix 6.6.

6.7 EA AND EAP (2018) CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS

EA (2018) Conditions

EA (2018) mainline directional volumes for the AM and PM peak hours are provided on Exhibit 6-7. As shown on Table 6-3, the following additional freeway segments are anticipated to operate at an unacceptable LOS (i.e., LOS D or better) during the peak hours for EA (2018) traffic conditions, in addition to those listed under Existing and E+P conditions:

- I-215 Northbound, South of Auto Center Dr. – LOS E PM peak hour only
- I-10 Eastbound, West of Waterman Av. – LOS E both peak hours

EA (2018) basic freeway segment analysis worksheets are provided in Appendix 6.7.

EAP (2018) Conditions

EAP (2018) mainline directional volumes for the AM and PM peak hours are provided on Exhibit 6-8. As shown on Table 6-3, there are no additional freeway segments anticipated to operate at an unacceptable LOS (i.e., LOS D or better) during the peak hours for EAP (2018) traffic conditions, in addition to those listed under Existing, E+P, and EA (2018) conditions.

EAP (2018) basic freeway segment analysis worksheets are provided in Appendix 6.8.

6.8 EA AND EAP (2018) CONDITIONS FREEWAY MERGE/DIVERGE ANALYSIS

EA (2018) Conditions

As shown in Table 6-4, the following merge area was found to operate at an unacceptable LOS

Table 6-2

Peak Hour Freeway Off-Ramp Queuing Summary for EA and EAP (2018) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	EA (2018)				EAP (2018)			
			95th Percentile Queue (Feet)		Acceptable? ¹		95th Percentile Queue (Feet)		Acceptable? ¹	
			AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
I-215 SB Off-Ramp / Auto Center Rd.	SBL	2,695	385 ²	166	Yes	Yes	396 ²	166	Yes	Yes
	SBL/T	2,230	369 ²	162	Yes	Yes	382 ²	168	Yes	Yes
	SBR	465	42	37	Yes	Yes	42	37	Yes	Yes
I-215 NB Off-Ramp / Auto Center Rd.	NBL	925	56	45	Yes	Yes	56	45	Yes	Yes
	NBL/T	1,050	55	45	Yes	Yes	55	45	Yes	Yes
	NBR	275	291 ²	209 ²	Yes ³	Yes	306 ²	235 ²	Yes ³	Yes
I-10 EB Off-Ramp / E. Redlands Bl.	SBL	100	380	311	Yes ⁴	Yes ⁴	380	311	Yes ⁴	Yes ⁴
	SBL/T	845	384	308	Yes	Yes	384	308	Yes	Yes
	SBR	215	352	110	Yes ⁴	Yes	352	110	Yes ⁴	Yes
I-10 WB Off-Ramp / E. Hospitality Ln.	NBL	800	327	194	Yes	Yes	338	203	Yes	Yes
	NBT	1,575	312	357	Yes	Yes	314	357	Yes	Yes
	NBR	160	68	119	Yes	Yes	68	119	Yes	Yes

¹ Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided.

² 95th percentile volume exceeds capacity, queue may be longer

³ Although the 95th percentile queue is anticipated to exceed the available storage for the turn lane, the adjacent through lane has sufficient storage to accommodate any spillover without spilling back and affecting the I-215 Freeway mainline.

⁴ Although the 95th percentile queue is anticipated to exceed the available storage for the turn lane, the adjacent through lane has sufficient storage to accommodate any spillover without spilling back and affecting the I-10 Freeway mainline.

Table 6-3

Basic Freeway Segment Analysis for EA and EAP (2018) Conditions

Freeway	Direction	Mainline Segment	Lanes ¹	EA (2018)						EAP (2018)									
				Volume		Truck %		Density ²		LOS		Volume		Truck %		Density ²		LOS	
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
I-215	NB	North of Auto Center Dr.	4	5,486	6,719	3%	1%	22.0	28.1	C	D	5,496	6,747	3%	1%	22.0	28.3	C	D
		South of Auto Center Dr.	4	7,142	7,761	3%	2%	31.2	35.5	D	E	7,170	7,776	3%	2%	31.4	35.6	D	E
	SB	North of Auto Center Dr.	5	6,827	5,635	4%	2%	22.0	17.7	C	B	6,851	5,647	4%	2%	22.1	17.7	C	B
I-10	EB	South of Auto Center Dr.	5	6,783	8,412	4%	3%	21.8	28.6	C	D	6,795	8,445	4%	3%	21.9	28.7	C	D
		West of Waterman Av.	4	7,441	6,541	10%	8%	35.3	28.4	E	D	7,468	6,556	10%	8%	35.5	28.5	E	D
	WB	East of Waterman Av.	5	6,713	6,722	11%	8%	22.4	22.1	C	C	6,723	6,751	11%	8%	22.5	22.2	C	C
		West of Waterman Av.	4	8,042	7,997	15%	17%	43.0	43.3	E	E	8,048	8,014	15%	17%	43.0	43.5	E	E
		East of Waterman Av.	4	8,705	7,226	14%	18%	51.2	35.8	F	E	8,729	7,239	14%	18%	51.6	35.9	F	E

¹ Number of lanes are in the specified direction and is based on existing conditions. No future improvements are currently planned.

² Density is measured by passenger cars per mile per lane (pc/mi/ln).

Table 6-4

Freeway Ramp Junction Merge/Diverge Analysis for EA and EAP (2018) Conditions

Freeway	Direction	Ramp or Segment	Lanes on Freeway ¹	EA (2018)				EAP (2018)			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Density ²	LOS	Density ²	LOS	Density ²	LOS	Density ²	LOS
I-215	NB	On-Ramp at Auto Center Drive	4	24.2	C	30.9	D	24.3	C	31.1	D
		Off-Ramp at Auto Center Drive	4	8.5	A	10.6	B	8.5	A	10.6	B
	SB	Off-Ramp at Auto Center Drive	5	29.3	D	24.9	C	29.5	D	25.0	C
		Loop On-Ramp (Upstream) at Auto Center Drive	4	27.1	C	29.1	D	27.2	C	29.3	D
		Loop On-Ramp (Downstream) at Auto Center Drive	5	22.9	C	29.2	D	23.1	C	29.6	D
I-10	EB	Off-Ramp at Waterman Avenue	4	23.9	C	19.2	B	24.1	C	19.3	B
		On-Ramp at Waterman Avenue	4	22.0	C	23.6	C	22.1	C	23.9	C
	WB	On-Ramp at Waterman Avenue	4	27.1	C	31.2	F	27.1	C	31.4	F
		Off-Ramp at Waterman Avenue	4	29.8	D	23.6	C	29.9	D	23.6	C

¹ Number of lanes are in the specified direction and is based on existing conditions. No future improvements are currently planned.

² Density is measured by passenger cars per mile per lane (pc/mi/ln).

EXHIBIT 6-7: EA (2018) FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)



LEGEND:

← 100/200 = AM/PM PEAK HOUR VOLUMES

NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)

EXHIBIT 6-8: EAP (2018) FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)



LEGEND:

← 100/200 = AM/PM PEAK HOUR VOLUMES

NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)

(i.e., LOS E or worse) during the PM peak hour for EA (2018) traffic conditions:

- I-10 Westbound, On-Ramp at Waterman Av. – LOS F PM peak hour only

EA (2018) freeway ramp junction operations analysis worksheets are provided in Appendix 6.9. EA (2018) freeway mainline volumes are shown on Exhibit 6-7.

EAP (2018) Conditions

As shown in Table 6-4, there are no additional merge/diverge areas found to operate at an unacceptable LOS during the peak hours for EAP (2018) traffic conditions, in addition to the merge area listed under EA (2018) conditions.

EAP (2018) freeway ramp junction operations analysis worksheets are provided in Appendix 6.10. EAP (2018) freeway mainline volumes are shown on Exhibit 6-8.

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7 EAC (2018) AND EAPC (2018) TRAFFIC CONDITIONS

This section discusses the traffic forecasts for EAC (2018) and EAPC (2018) conditions and the resulting intersection operations and traffic signal warrant analyses.

7.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for EAC (2018) and EAPC (2018) conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the following:

- Driveways and those facilities assumed to be constructed by cumulative developments to provide site access are also assumed to be in place for EAC (2018) and EAPC (2018) (e.g., intersection and roadway improvements along the cumulative development's frontages and driveways).
- Project driveways and those facilities assumed to be in place prior to or constructed by the Project to provide site access are also assumed to be in place for EAPC (2018) conditions.

7.2 EAC (2018) TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus an ambient growth factor of 3.0% in conjunction with the addition of cumulative development traffic. The weekday ADT, weekday AM, and PM peak hour volumes which can be expected for EAC (2018) traffic conditions are shown on Exhibit 7-1 and Exhibit 7-2.

7.3 EAPC (2018) TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus an ambient growth factor of 3.0% in conjunction with the addition of cumulative project development and the addition of Project traffic. The weekday ADT, weekday AM, and PM peak hour volumes which can be expected for EAPC (2018) traffic conditions are shown on Exhibit 7-3 and Exhibit 7-4.

7.4 INTERSECTION OPERATIONS ANALYSIS

EAC and EAPC (2018) peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2 *Methodologies* of this TIA. The intersection analysis results are summarized in Table 7-1 for both EAC and EAPC (2018) conditions.

7.4.1 EAC (2018) CONDITIONS

The following study area intersection is anticipated to operate at an unacceptable LOS during the peak hours under EAC (2018) conditions:

- I-10 Westbound Ramps/Carnegie Dr. / Hospitality Ln. (#16) – LOS E PM peak hour only

EXHIBIT 7-1: EAC (2018) AVERAGE DAILY TRAFFIC (ADT)

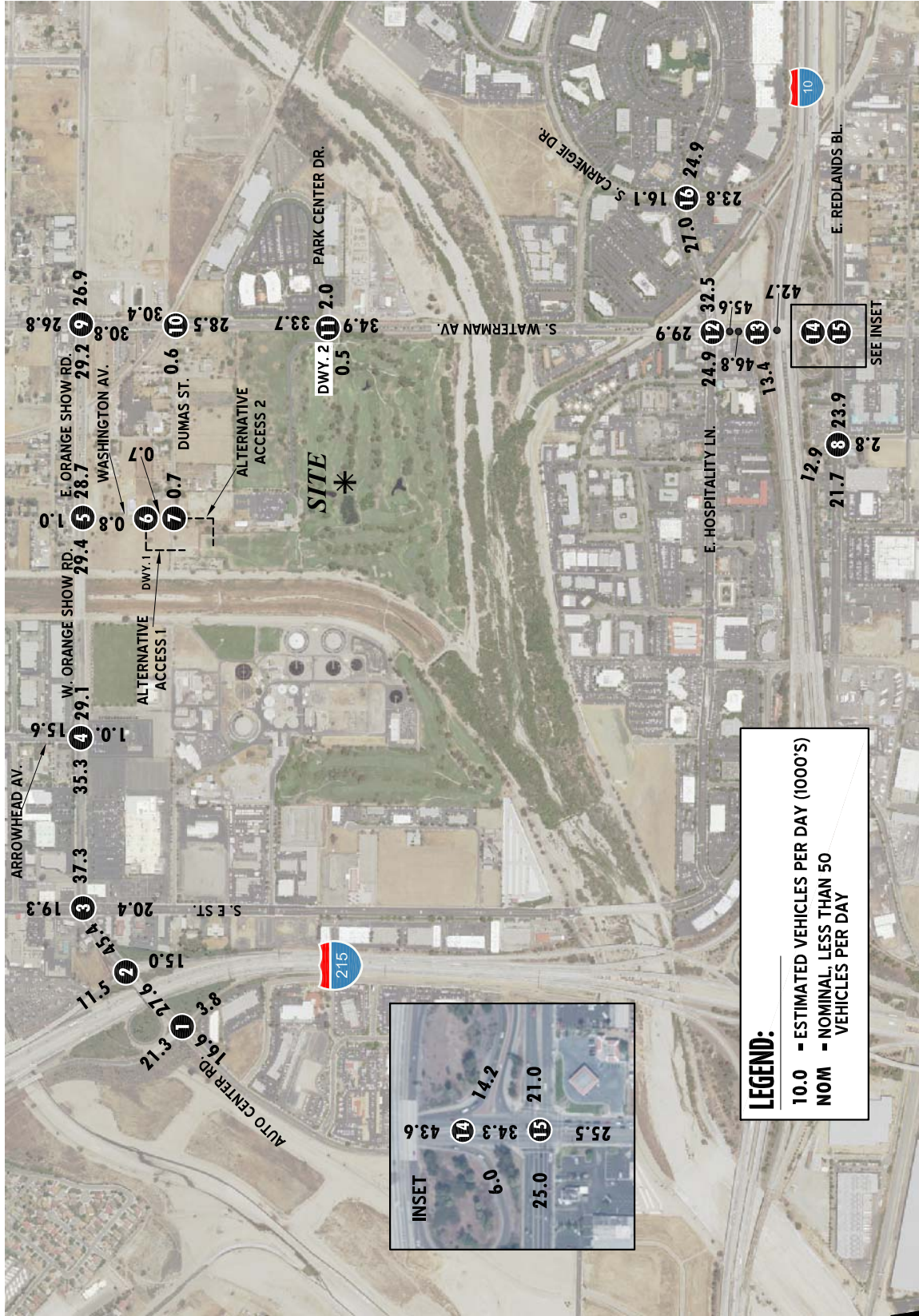


EXHIBIT 7-2: EAC (2018) TRAFFIC VOLUMES

<p>1 I-215 SB Ramps & Auto Center Rd.</p> <p>359(276) 67(104) 1145(608) 296(739) 228(426)</p> <p>144(466) 34(179)</p>	<p>2 I-215 NB Ramps & Auto Center Rd.</p> <p>291(715) 360(1061)</p> <p>83(230) 1226(840)</p> <p>168(122) 9(7) 089(1071)</p>	<p>3 S. "E" St. & Auto Center Rd. / W. Orange Show Rd.</p> <p>51(270) 136(283) 52(236) 68(141) 421(1094) 62(157)</p> <p>239(245) 1498(1253) 495(362)</p> <p>171(319) 182(398) 122(146)</p>	<p>4 S. Arrowhead Av. & W. Orange Show Rd.</p> <p>231(599) 11(3) 114(206) 104(161) 369(820) 7(10)</p> <p>408(300) 1200(1118) 18(4)</p> <p>0(21) 3(9) 5(38)</p>	<p>5 S. Washington Av. & W. Orange Show Rd.</p> <p>7(11) 3(2) 13(11) 20(15) 462(950) 2(4)</p> <p>50(34) 1222(1350) 21(17)</p> <p>11(28) 4(4) 0(5)</p>
<p>6 Washington Av. & Dwy. 1</p> <p>Intersection Does Not Exist</p>	<p>7 Washington Av. & Dumas St.</p> <p>0(0) 26(22) 13(32) 0(0)</p> <p>0(0) 0(0)</p>	<p>8 I-10 EB Ramps & E. Redlands Bl.</p> <p>686(400) 339(172) 603(521) 565(614) 36(22)</p> <p>499(830) 32(18)</p> <p>23(64)</p>	<p>9 S. Waterman Av. & E. Orange Show Rd.</p> <p>74(149) 632(822) 81(151) 92(95) 333(583) 169(183)</p> <p>202(187) 627(937) 392(259)</p> <p>85(268) 521(795) 152(210)</p>	<p>10 S. Waterman Av. & E. Dumas St.</p> <p>16(8) 1224(1227)</p> <p>3(2) 13(18)</p> <p>8(13) 755(1270)</p>
<p>11 S. Waterman Av. & Dwy. 2 / Park Center Dr.</p> <p>5(2) 960(1431) 48(9) 8(36) 1(0) 21(106)</p> <p>0(8) 0(0) 0(21)</p> <p>21(8) 817(1290) 125(17)</p>	<p>12 S. Waterman Av. & E. Hospitality Ln.</p> <p>146(153) 569(1157) 133(246) 133(150) 410(463) 440(427)</p> <p>163(173) 188(394) 143(573)</p> <p>294(282) 930(585) 848(748)</p>	<p>13 S. Waterman Av. & I-10 WB Ramps</p> <p>164(721) 991(1522)</p> <p>297(406) 2071(1639)</p>	<p>14 S. Waterman Av. & I-10 EB Ramps</p> <p>144(492) 847(1066) 1189(709)</p> <p>1180(1372) 316(464)</p>	<p>15 S. Waterman Av. & E. Redlands Bl.</p> <p>292(217) 469(633) 86(217) 119(203) 240(369) 112(175)</p> <p>512(644) 388(692) 243(166)</p> <p>61(56) 864(989) 114(86)</p>
<p>16 S. Carnegie Dr. & E. Hospitality Ln.</p> <p>93(129) 150(646) 15(92) 27(126) 219(436) 86(471)</p> <p>222(184) 362(839) 113(245)</p> <p>742(362) 291(155) 64(74)</p>	<p>LEGEND: 10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES</p>			

EXHIBIT 7-3: EAPC (2018) AVERAGE DAILY TRAFFIC (ADT)

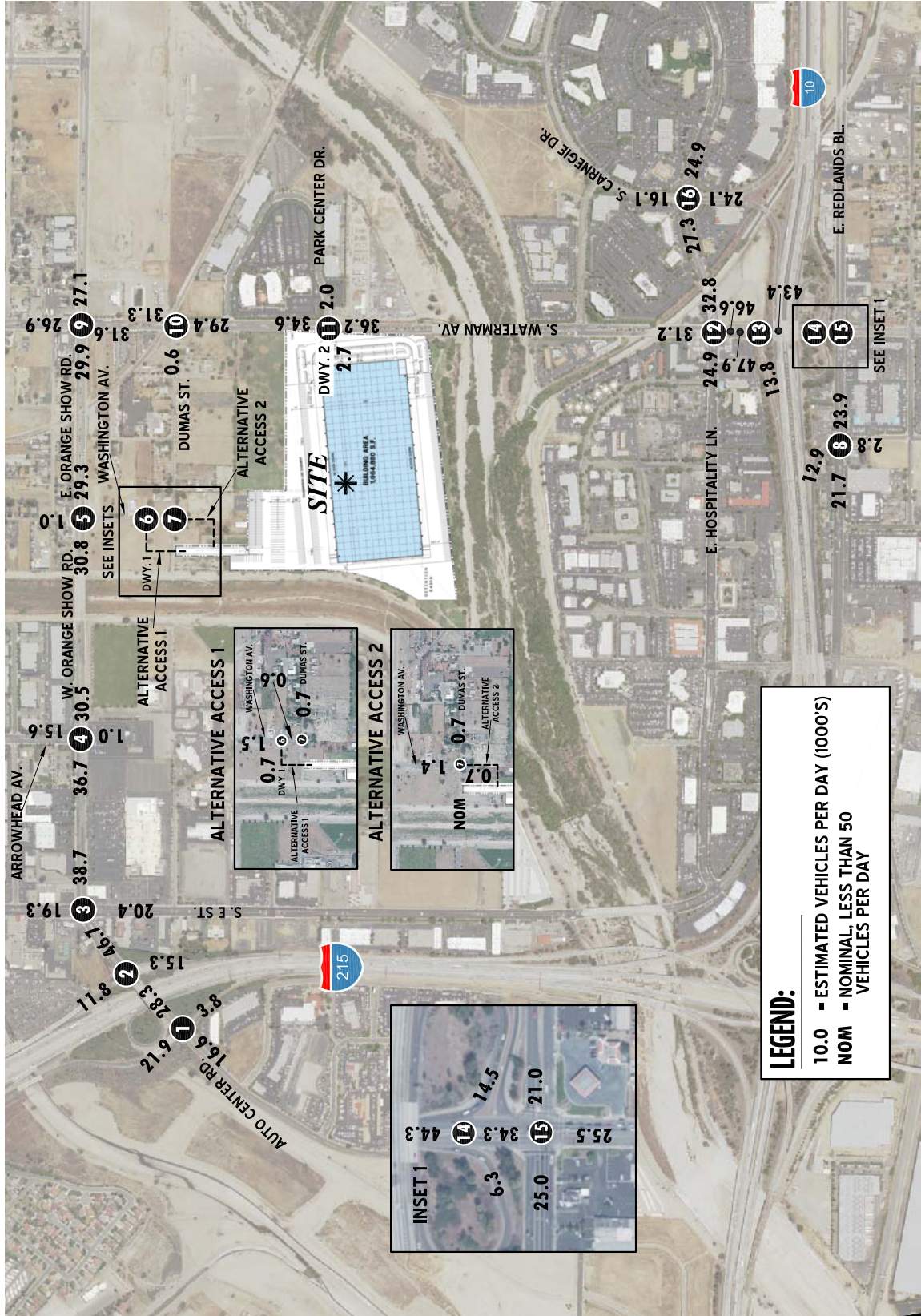


EXHIBIT 7-4: EAPC (2018) TRAFFIC VOLUMES

1 I-215 SB Ramps & Auto Center Rd.	2 I-215 NB Ramps & Auto Center Rd.	3 S. "E" St. & Auto Center Rd. / W. Orange Show Rd.	4 S. Arrowhead Av. & W. Orange Show Rd.	5 S. Washington Av. & W. Orange Show Rd.
359(276) 67(104) 1,169(620) 308(772) 229(428)	301(743) 373(1,096)	51(270) 136(283) 54(237) 69(143) 444(1,156) 63(158)	231(599) 11(3) 115(207) 105(162) 394(885) 7(10)	7(11) 3(2) 13(11) 20(15) 477(985) 2(4)
146(467) 34(179)	83(230) 1,252(853)	239(245) 552(1,281) 495(362) 171(319) 182(398) 123(147)	408(300) 1,257(1,147) 18(4) 0(21) 3(9) 5(38)	50(34) 1,256(1,365) 45(31) 21(60) 4(4) 0(5)

ALTERNATIVE ACCESS 1

6 Washington Av. & Dwy. 1	7 Washington Av. & Dumas St.
24(14) 26(17) 10(32) 0(0)	0(0) 26(22) 13(32) 0(0) 0(0) 0(0) 11(28)

ALTERNATIVE ACCESS 2

6 Washington Av. & Dwy. 1	7 Washington Av. & Dumas St.
Not Applicable	0(0) 24(14) 26(17) 13(29) 0(3) 0(0) 0(0) 0(0) 10(32) 0(0)

8 I-10 EB Ramps & E. Redlands Bl.	9 S. Waterman Av. & E. Orange Show Rd.	10 S. Waterman Av. & E. Dumas St.	11 S. Waterman Av. & Dwy. 2 / Park Center Dr.	12 S. Waterman Av. & E. Hospitality Ln.
686(400) 313(127) 603(521) 565(614) 36(22)	74(149) 634(823) 81(151) 92(95) 333(583) 178(187)	16(8) 1,268(1,247) 3(2) 13(18) 8(13) 775(1,315)	49(22) 960(1,431) 48(9) 8(36) 1(0) 21(106)	152(170) 585(1,163) 133(246) 157(163) 410(463) 440(427)
499(830) 32(18) 23(64)	202(187) 627(937) 426(274) 100(303) 522(797) 156(219)	292(217) 469(633) 86(217) 119(203) 240(369) 112(175)	20(53) 0(0) 22(82) 72(36) 817(1,290) 125(17)	163(173) 188(394) 143(573) 294(282) 957(600) 848(748)
13 S. Waterman Av. & I-10 WB Ramps	14 S. Waterman Av. & I-10 EB Ramps	15 S. Waterman Av. & E. Redlands Bl.	16 S. Carnegie Dr. & E. Hospitality Ln.	
170(737) 1,001(1,551)	154(521) 847(1,066) 1,216(724)	512(644) 388(692) 243(166) 61(56) 864(989) 114(86)	93(129) 150(646) 15(92) 27(126) 219(436) 86(471)	
297(406) 2,098(1,654)	1,180(1,372) 316(464)	222(184) 362(839) 119(261) 766(375) 291(155) 64(74)		

LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES

Table 7-1

Intersection Analysis for EAC and EAPC (2018) Conditions

#	Intersection	Traffic Control ²	EAC (2018)						EAPC (2018)						Δ v/c		Significant Impact ⁵
			Delay ¹ (secs.)		LOS ⁷		Average v/c ^{3,b}		Delay ¹ (secs.)		LOS ⁷		Average v/c ³		Difference ⁶		
			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	
1	I-215 SB Ramps / Auto Center Rd.	TS	24.1	12.0	C	--	0.54	0.46	26.0	12.0	C	B	0.55	--	0.01	--	No
2	I-215 NB Ramps / Auto Center Rd.	TS	31.2	31.9	C	C	0.87	0.89	34.6	34.5	C	C	0.89	0.91	0.02	0.02	No
3	E St. / Auto Center Rd. / Orange Show Rd. ⁴	TS	40.3	46.0	D	D	0.82	0.93	47.7	51.6	D	D	0.83	0.94	0.01	0.01	No
4	Arrowhead Av. / Orange Show Rd.	TS	36.2	34.9	D	C	0.60	0.67	37.0	44.8	D	D	0.60	0.69	0.00	0.02	No
5	Washington Av. / Orange Show Rd.	TS	6.4	7.5	A	A	--	--	6.8	8.9	A	A	--	--	--	--	No
6	Washington Av. / Driveway 1	CSS	Intersection Does Not Exist						8.8	9.0	A	A	--	--	--	--	No
7	Washington Av. / Dumas St.	CSS	8.7	8.8	A	A	--	--	8.7	8.8	A	A	--	--	--	--	No
	<i>Alternative Access:</i>	CSS	Not Applicable						9.2	9.5	A	A	--	--	--	--	No
8	I-10 EB Ramps / E. Redlands Bl.	TS	34.3	29.5	C	C	0.65	0.57	34.3	29.5	C	C	0.65	0.57	0.00	0.00	No
9	S. Waterman Av. / Orange Show Rd.	TS	48.6	53.6	D	D	0.75	1.08	50.8	54.9	D	D	0.77	1.10	0.02	0.02	No
10	S. Waterman Av. / Dumas St.	CSS	19.5	18.6	C	C	0.02	0.01	19.9	19.0	C	C	0.02	0.01	0.00	0.00	No
11	S. Waterman Av. / Park Center Dr.	TS	7.1	13.2	A	B	--	--	10.4	20.1	B	C	--	0.68	--	--	No
12	S. Waterman Av. / Hospitality Ln.	TS	41.7	53.1	D	D	0.75	0.79	42.3	53.2	D	D	0.76	0.79	0.01	0.00	No
13	S. Waterman Av. / I-10 WB On-Ramp	CSS	11.3	17.6	B	C	--	0.61	11.3	17.6	B	C	--	0.61	--	0.00	No
14	S. Waterman Av. / I-10 EB Ramps	CSS	0.0	0.0	A	A	--	--	0.0	0.0	A	A	--	--	--	--	No
15	S. Waterman Av. / E. Redlands Bl.	TS	43.4	54.4	D	D	0.74	1.00	43.4	54.4	D	D	0.74	1.00	0.00	0.00	No
16	I-10 WB Ramps/Carnegie Dr. / Hospitality Ln.	TS	44.4	71.8	D	E	0.62	0.87	44.6	72.0	D	E	0.62	0.87	0.00	0.00	No

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

¹ Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with a traffic signal or all-way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

² CSS = Cross-street Stop; AWS = All Way Stop; TS = Traffic Signal; **CSS** = Improvement

³ Volume to capacity ratio has been reported using the HCM 2000 methodology (as HCM 2010 does not report the overall v/c) for intersections operating at LOS C or worse, consistent with the City of San Bernardino Traffic Impact Study Guidelines.

⁴ Although there is a second northbound left turn lane, the analysis has been performed assuming a single left as vehicles headed onto the I-215 Northbound often block the inner left turn lane. As a result, the inner left turn lane does not get adequately utilized each cycle.

⁵ Significant impact has been identified if the change in v/c exceeds the applicable thresholds per the City of San Bernardino Traffic Impact Study Guidelines

⁶ The TIA Guidelines have significance criteria based on v/c difference for LOS C or worse. As such, v/c ratios and difference in v/c have not been reported for LOS "A" or LOS "B".

⁷ LOS = Level of Service

Consistent with Table 7-1, a summary of the peak hour intersection LOS for EAC (2018) conditions are shown on Exhibit 7-5. The intersection operations analysis worksheets for EAC (2018) traffic conditions are included in Appendix 7.1 of this TIA.

7.4.2 EAPC (2018) CONDITIONS

The intersection analysis results indicate that the addition of Project traffic is not anticipated to result in any additional LOS deficiencies for EAPC (2018) conditions.

Consistent with Table 7-1, a summary of the peak hour intersection LOS for EAPC (2018) conditions are shown on Exhibit 7-6. The intersection operations analysis worksheets for EAPC (2018) traffic conditions are included in Appendix 7.2 of this TIA.

7.5 EAP AND EAPC (2018) TRAFFIC SIGNAL WARRANTS ANALYSIS

No study area intersections are anticipated to meet traffic signal warrants for either EAC (2018) or EAPC (2018) traffic conditions (see Appendix 7.3 and 7.4).

7.6 EAP AND EAPC (2018) OFF-RAMP QUEUING ANALYSIS

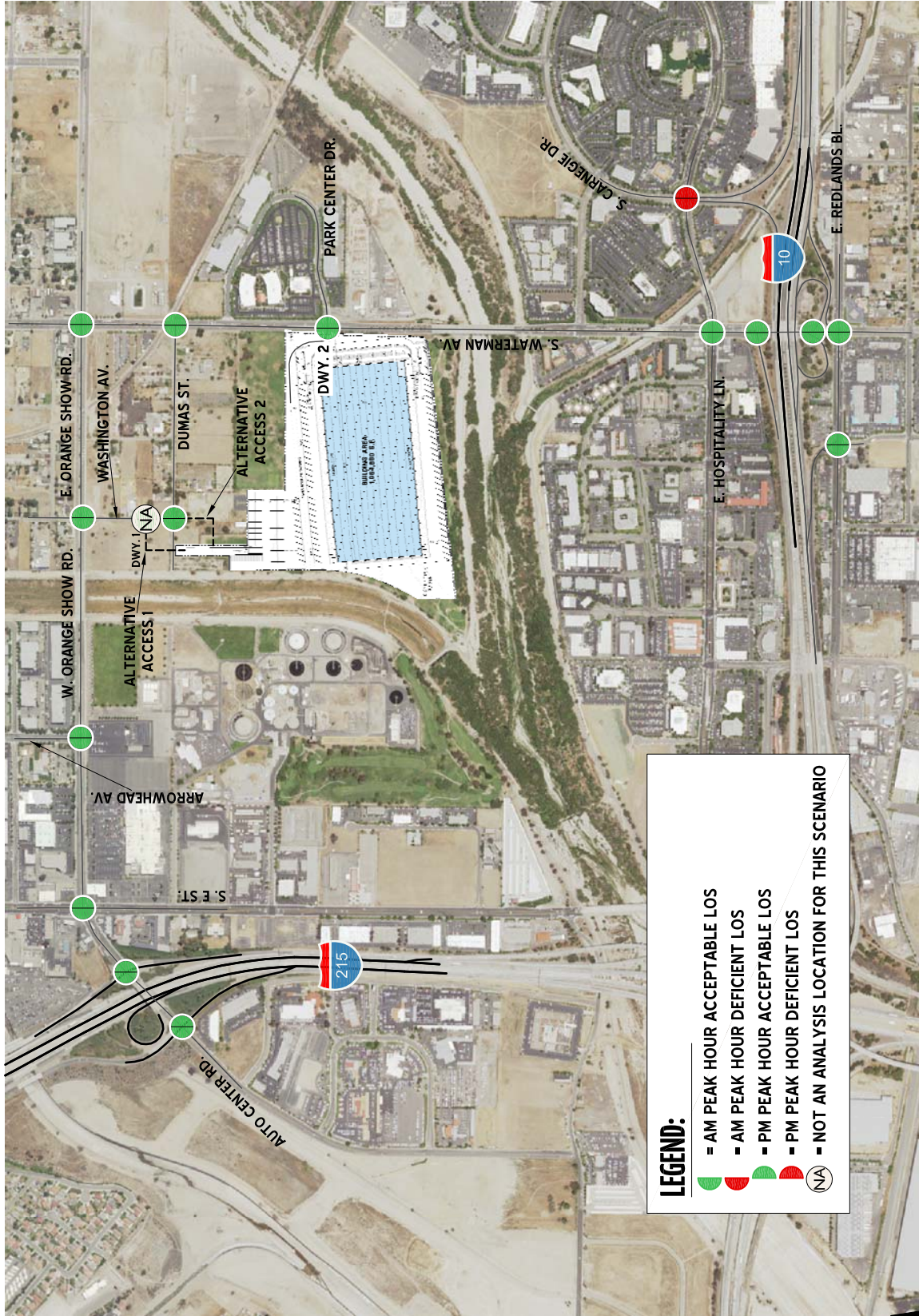
A queuing analysis was performed for the off-ramps at the I-215 Freeway and Auto Center Drive, I-10 Freeway and E. Redlands Boulevard, and I-10 Freeway and Hospitality Lane interchanges to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially “spill back” onto the I-215 Freeway and I-10 Freeway mainline. Queuing analysis findings are presented in Table 7-2 for EAC (2018) and EAPC (2018) traffic conditions. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline. As shown on Table 7-2, there are no movements anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for either EAC (2018) or EAPC (2018) traffic conditions.

Worksheets for EAC (2018) and EAPC (2018) conditions off-ramp queuing analysis are provided in Appendix 7.5 and 7.6, respectively.

7.7 EAPC (2018) QUEUING ANALYSIS AT WATERMAN AVENUE AND ORANGE SHOW ROAD

A queuing analysis was performed at the intersection for S. Waterman Avenue and Orange Show Road to assess vehicle queues that could potentially queue back to the at-grade railroad crossing on Orange Show Road, just west of Waterman Avenue and on Waterman Avenue, south of Orange Show Road. Queuing analysis findings are presented in Table 7-3 for EAPC (2018) traffic conditions. It is important to note that the lengths and distances are consistent with the measured distance between the intersection and the railroad. As shown on Table 7-3, the northbound movement is anticipated to experience queuing issues during the weekday PM peak 95th percentile traffic flows for EAPC (2018) traffic conditions. However, with recommended improvements implemented, there are no movements anticipated to experience queuing issues.

EXHIBIT 7-5: EAC (2018) SUMMARY OF LOS

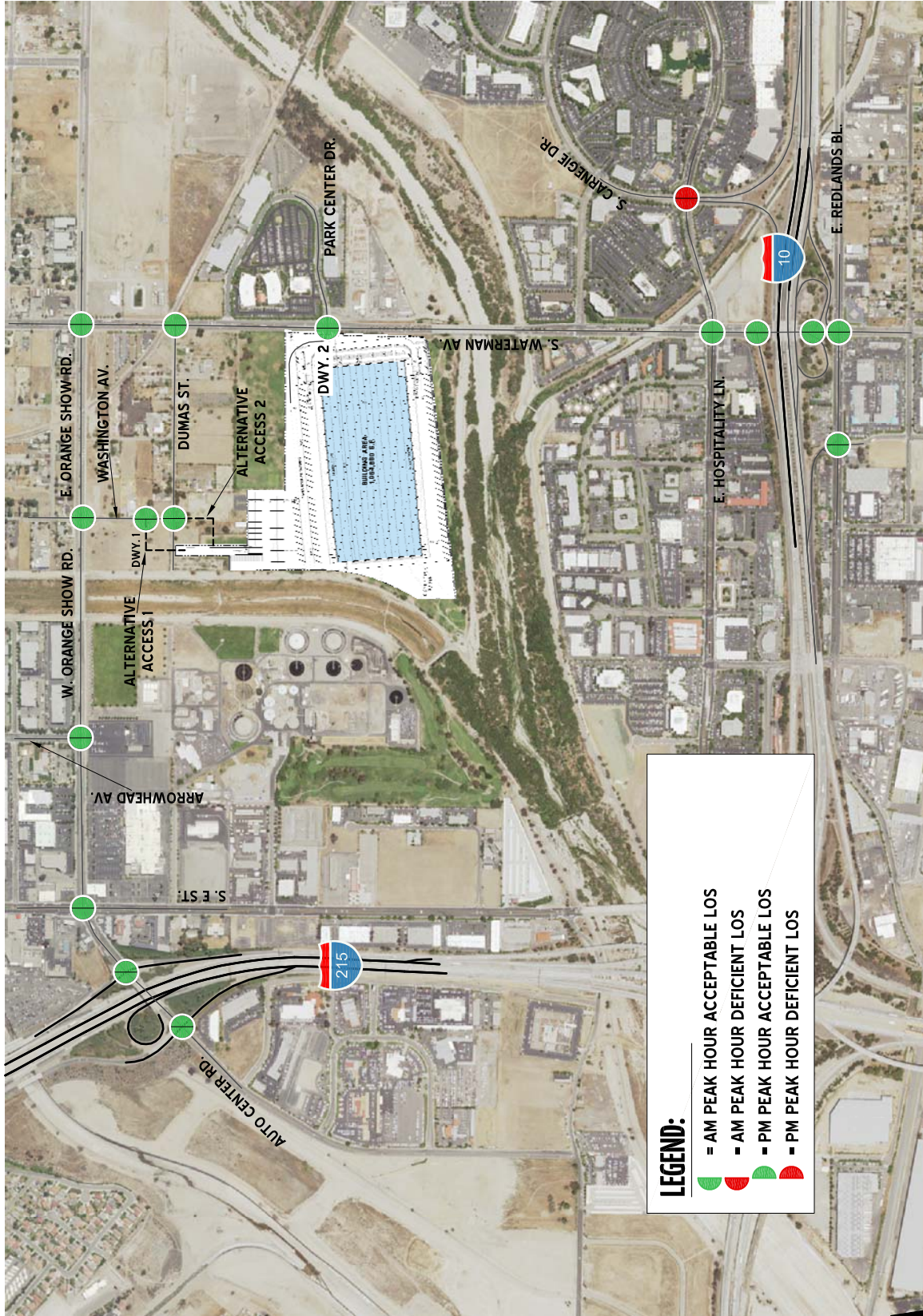


LEGEND:

- = AM PEAK HOUR ACCEPTABLE LOS
- = AM PEAK HOUR DEFICIENT LOS
- = PM PEAK HOUR ACCEPTABLE LOS
- = PM PEAK HOUR DEFICIENT LOS
- NA = NOT AN ANALYSIS LOCATION FOR THIS SCENARIO



EXHIBIT 7-6: EAPC (2018) SUMMARY OF LOS



LEGEND:

- = AM PEAK HOUR ACCEPTABLE LOS
- = AM PEAK HOUR DEFICIENT LOS
- = PM PEAK HOUR ACCEPTABLE LOS
- = PM PEAK HOUR DEFICIENT LOS



Table 7-2

Peak Hour Freeway Off-Ramp Queuing Summary for EAC and EAPC (2018) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	EAC (2018)				EAPC (2018)			
			95th Percentile Queue (Feet)		Acceptable? ¹		95th Percentile Queue (Feet)		Acceptable? ¹	
			AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
I-215 SB Off-Ramp / Auto Center Rd.	SBL	2,695	425 ²	174	Yes	Yes	436 ²	180	Yes	Yes
	SBL/T	2,230	405 ²	173	Yes	Yes	416 ²	176	Yes	Yes
	SBR	465	42	40	Yes	Yes	42	40	Yes	Yes
I-215 NB Off-Ramp / Auto Center Rd.	NBL	925	62	46	Yes	Yes	62	46	Yes	Yes
	NBL/T	1,050	61	46	Yes	Yes	61	46	Yes	Yes
	NBR	275	395 ²	306 ²	Yes ³	Yes ³	410 ²	316 ²	Yes ³	Yes ³
I-10 EB Off-Ramp / E. Redlands Bl.	SBL	100	384	315	Yes ⁴	Yes ⁴	384	315	Yes ⁴	Yes ⁴
	SBL/T	845	384	311	Yes	Yes	384	311	Yes	Yes
	SBR	215	480	131	Yes ⁴	Yes	480	131	Yes ⁴	Yes
I-10 WB Off-Ramp / E. Hospitality Ln.	NBL	800	387 ²	207	Yes	Yes	407 ²	215	Yes	Yes
	NBT	1,575	368	510 ²	Yes	Yes	369 ²	512 ²	Yes	Yes
	NBR	160	73	160	Yes	Yes	73	160	Yes	Yes

¹ Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided.

² 95th percentile volume exceeds capacity, queue may be longer

³ Although the 95th percentile queue is anticipated to exceed the available storage for the turn lane, the adjacent through lane has sufficient storage to accommodate any spillover without spilling back and affecting the I-215 Freeway mainline.

⁴ Although the 95th percentile queue is anticipated to exceed the available storage for the turn lane, the adjacent through lane has sufficient storage to accommodate any spillover without spilling back and affecting the I-10 Freeway mainline.

Table 7-3

Intersection Queuing Summary for EAPC (2018) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	95th Percentile Queue (Feet)		Acceptable? ¹	
			AM Peak	PM Peak	AM	PM
Waterman Ave. / Orange Show Road	-Without Improvements	NB	205	722	Yes	No
		EB	217	416	Yes	Yes
	- With Improvements ²	NB	203	226	Yes	Yes
		EB	220	576	Yes	Yes

¹ Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided.

² Although Waterman / Orange Show is not significantly impacted by the addition of project traffic, improvements are necessary to address queuing issues.

Worksheets for EAPC (2018) conditions queuing analysis at the intersection of Waterman Avenue and Orange Show Road are provided in Appendix 7.7. Worksheets for EAPC (2018) conditions with improvements queuing analysis at the intersection of Waterman Avenue and Orange Show Road are provided in Appendix 7.8.

7.8 RECOMMENDED IMPROVEMENTS

Improvement strategies have been recommended at the intersection of Waterman Avenue and Orange Show Road in order to address queuing issues, which includes a second northbound left-turn lane and a northbound right-turn lane. The effectiveness of the recommended improvement strategies to address EAPC (2018) queuing issues are presented in Table 7-4.

Worksheets for EAC (2018) and EAPC (2018) traffic conditions, with improvements, HCM calculation worksheets are provided in Appendix 7.9 and 7.10, respectively.

7.9 EAC AND EAPC (2018) CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS

EAC (2018) Conditions

EAC (2018) mainline directional volumes for the AM and PM peak hours are provided on Exhibit 7-7. As shown on Table 7-5, no additional freeway segments were found to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for EAC (2018) traffic conditions, in addition to those previously identified under Existing, E+P, EA (2018), and EAP (2018) traffic conditions.

EAC (2018) basic freeway segment analysis worksheets are provided in Appendix 7.11.

EAPC (2018) Conditions

EAPC (2018) mainline directional volumes for the AM and PM peak hours are provided on Exhibit 7-8. As shown on Table 7-5, there are no additional freeway segments anticipated to operate at an unacceptable LOS (i.e., LOS D or better) during the peak hours for EAPC (2018) traffic conditions, in addition to those listed under Existing, E+P, EA (2018), EAP (2018), and EAC (2018) conditions.

Table 7-4

Intersection Analysis for EAC and EAPC (2018) Conditions With Improvements

#	Intersection	Traffic Control ³	Intersection Approach Lanes ¹												Delay ² (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound			AM	PM	AM	PM
			L	T	R	L	T	R	L	T	R	L	T	R				
9	S. Waterman Av. / Orange Show Rd. - EAC (2018) - Without Improvements - With Improvements ⁴ - EAPC (2018) - Without Improvements - With Improvements ⁴	TS	1	2	d	1	2	d	1	2	d	1	2	d	48.6	53.6	D	D
		TS	<u>2</u>	2	<u>1</u>	1	2	d	1	2	d	1	2	d	42.9	36.4	D	D
		TS	1	2	d	1	2	d	1	2	d	1	2	d	50.8	54.9	D	D
		TS	<u>2</u>	2	<u>1</u>	1	2	d	1	2	d	1	2	d	43.5	37.1	D	D

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

¹ When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; d = Defacto Right Turn Lane; > = Right-Turn Overlap Phasing; >> = Free-Right Turn Lane; 1 = Improvement

² Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with a traffic signal or all-way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

³ CSS = Cross-Street Stop; TS = Traffic Signal

⁴ Although Waterman / Orange Show is not significantly impacted by the addition of project traffic, improvements are necessary to address queuing issues.

Table 7-5

Basic Freeway Segment Analysis for EAC and EAPC (2018) Conditions

Freeway	Direction	Mainline Segment	Lanes ¹	EAC (2018)						EAPC (2018)									
				Volume		Truck %		Density ²		LOS		Volume		Truck %		Density ²		LOS	
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
I-215	NB	North of Auto Center Dr.	4	5,534	6,781	3%	1%	22.2	28.5	3%	1%	22.2	28.5	3%	1%	22.2	28.6	C	D
	SB	South of Auto Center Dr.	4	7,391	7,900	2%	2%	32.7	36.7	4%	2%	32.7	36.7	3%	2%	33.2	36.8	D	E
I-10	WB	North of Auto Center Dr.	5	6,909	5,672	4%	2%	22.3	17.8	10%	8%	22.0	29.1	4%	3%	22.0	29.2	C	D
	EB	South of Auto Center Dr.	5	6,825	8,514	4%	3%	22.0	29.1	11%	8%	22.5	22.2	11%	8%	22.5	22.3	C	C
I-10	WB	West of Waterman Av.	4	7,463	6,555	10%	8%	35.5	28.5	15%	17%	43.7	44.5	15%	16%	43.8	44.3	E	E
	EB	East of Waterman Av.	5	6,736	6,760	11%	8%	22.5	22.2	13%	18%	52.8	36.8	14%	18%	53.9	36.9	F	E
I-10	WB	West of Waterman Av.	4	8,107	8,098	15%	17%	43.7	44.5	15%	16%	43.8	44.3	15%	16%	43.8	44.3	E	E
	EB	East of Waterman Av.	4	8,854	7,330	13%	18%	52.8	36.8	14%	18%	53.9	36.9	14%	18%	53.9	36.9	F	E

¹ Number of lanes are in the specified direction and is based on existing conditions. No future improvements are currently planned.

² Density is measured by passenger cars per mile per lane (pc/mi/ln).

EXHIBIT 7-7: EAC (2018) FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)



LEGEND:

← 100/200 = AM/PM PEAK HOUR VOLUMES
NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)

EXHIBIT 7-8: EAPC (2018) FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)



LEGEND:

← 100/200 = AM/PM PEAK HOUR VOLUMES
NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)

EAPC (2018) basic freeway segment analysis worksheets are provided in Appendix 7.12.

7.10 EAC AND EAPC (2018) CONDITIONS FREEWAY MERGE/DIVERGE ANALYSIS

EAC (2018) Conditions

As shown in Table 7-6, no additional merge/diverge areas were found to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for EAC (2018) traffic conditions, in addition to those previously identified under EA (2018), and EAP (2018) traffic conditions.

EAC (2018) freeway ramp junction operations analysis worksheets are provided in Appendix 7.13. EAC (2018) freeway mainline volumes are shown on Exhibit 7-7.

EAPC (2018) Conditions

As shown in Table 7-6, there are no additional merge/diverge areas found to operate at an unacceptable LOS during the peak hours for EAPC (2018) traffic conditions, in addition to those previously identified under EA and EAP (2018) conditions.

EAPC (2018) freeway ramp junction operations analysis worksheets are provided in Appendix 7.14. EAPC (2018) freeway mainline volumes are shown on Exhibit 7-8.

Table 7-6

Freeway Ramp Junction Merge/Diverge Analysis for EAC and EAPC (2018) Conditions

Freeway	Direction	Ramp or Segment	Lanes on Freeway ¹	EAC (2018)				EAPC (2018)			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Density ²	LOS	Density ²	LOS	Density ²	LOS	Density ²	LOS
I-215	NB	On-Ramp at Auto Center Drive	4	24.6	C	31.4	D	24.7	C	31.6	D
		Off-Ramp at Auto Center Drive	4	8.9	A	10.6	B	9.1	A	10.6	B
	SB	Off-Ramp at Auto Center Drive	5	29.8	D	25.1	C	29.9	D	25.2	C
		Loop On-Ramp (Upstream) at Auto Center Drive	4	27.5	C	29.9	D	27.6	C	30.2	D
		Loop On-Ramp (Downstream) at Auto Center Drive	5	23.4	C	30.4	D	23.5	C	30.9	D
I-10	EB	Off-Ramp at Waterman Avenue	4	24.1	C	19.3	B	24.2	C	19.4	B
		On-Ramp at Waterman Avenue	4	22.2	C	24.0	C	22.2	C	24.2	C
	WB	On-Ramp at Waterman Avenue	4	27.6	F	32.0	F	27.6	F	32.2	F
		Off-Ramp at Waterman Avenue	4	30.6	D	24.1	C	30.7	D	24.2	C

¹ Number of lanes are in the specified direction and is based on existing conditions. No future improvements are currently planned.

² Density is measured by passenger cars per mile per lane (pc/mi/ln).

8 HORIZON YEAR (2040) TRAFFIC CONDITIONS

This section discusses the methods used to develop Horizon Year (2040) Without and With Project traffic forecasts, and the resulting intersection operations and traffic signal warrant analyses.

8.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for Horizon Year (2040) conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the following:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for Horizon Year (2040) conditions only (e.g., intersection and roadway improvements along the Project's frontage and driveways).
- Driveways and those facilities assumed to be constructed by cumulative developments to provide site access are also assumed to be in place for Horizon Year (2040) conditions only (e.g., intersection and roadway improvements along the cumulative development's frontages and driveways).

8.2 HORIZON YEAR (2040) WITHOUT PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes the refined post-processed volumes obtained from the SBTAM. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Horizon Year (2040) Without Project traffic conditions are shown on Exhibit 8-1 and Exhibit 8-2.

8.3 HORIZON YEAR (2040) WITH PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes the refined post-processed volumes obtained from the SBTAM, plus Project traffic. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Long Range With Project traffic conditions are shown on Exhibit 8-3 and Exhibit 8-4.

8.4 INTERSECTION OPERATIONS ANALYSIS

8.4.1 HORIZON YEAR (2040) WITHOUT PROJECT TRAFFIC CONDITIONS

LOS calculations were conducted for the study intersections to evaluate their operations under Horizon Year Without Project conditions with roadway and intersection geometrics consistent with Section 8.1 *Roadway Improvements*. As shown in Table 8-1, the following study area intersections are anticipated to operate at an unacceptable LOS during the peak hours under Horizon Year (2040) Without Project conditions, in addition to the intersection previously identified under EAC (2018) and EAPC (2018) traffic conditions:

EXHIBIT 8-1: HORIZON YEAR (2040) WITHOUT PROJECT AVERAGE DAILY TRAFFIC (ADT)

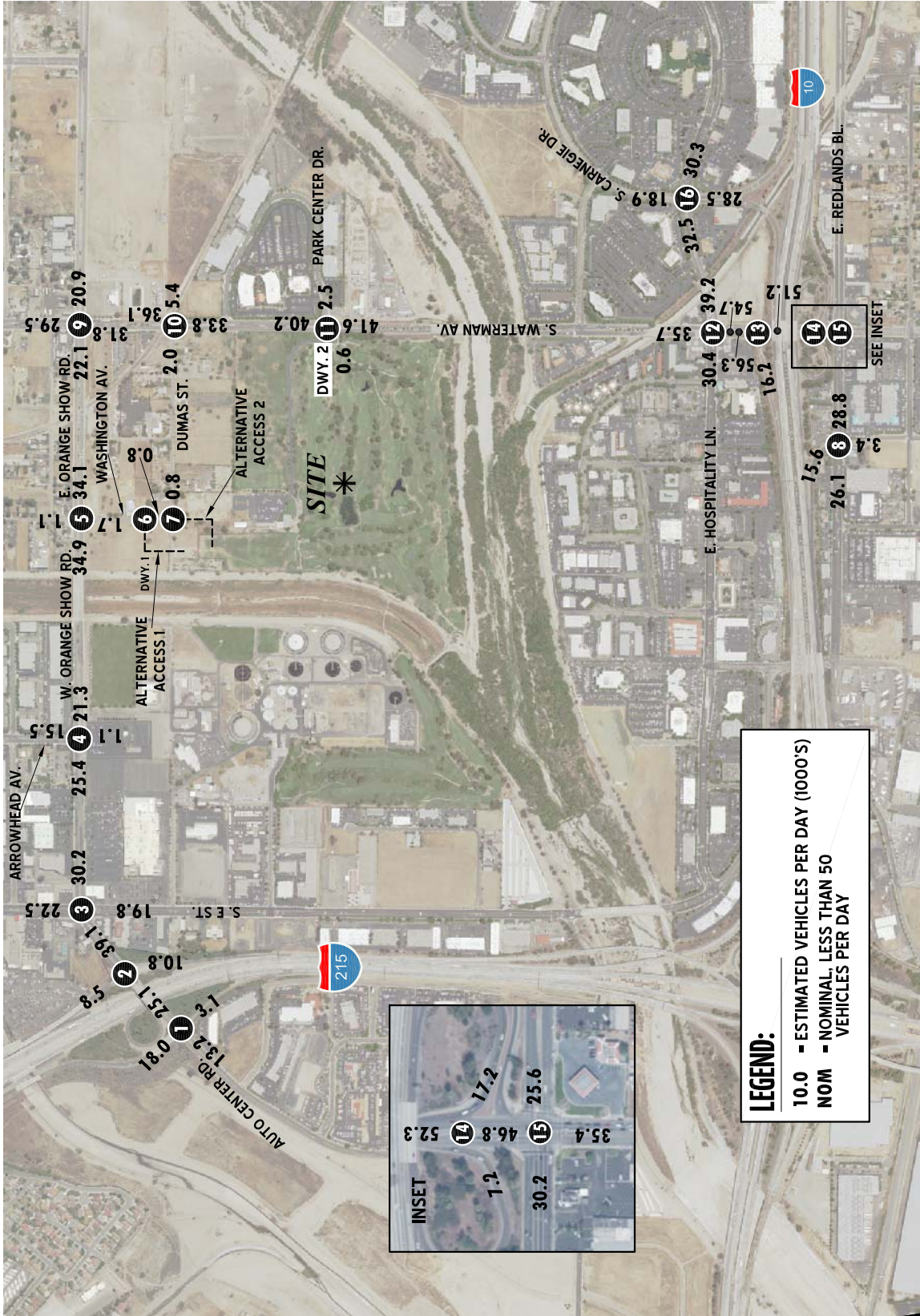


EXHIBIT 8-2: HORIZON YEAR (2040) WITHOUT PROJECT TRAFFIC VOLUMES

<p>1 I-215 SB Ramps & Auto Center Rd.</p> <p>286(178) 40(91) 1386(861) 426(1097) 577(526)</p> <p>373(457) 122(257)</p>	<p>2 I-215 NB Ramps & Auto Center Rd.</p> <p>421(828) 567(1518)</p> <p>181(198) 1578(1120)</p> <p>436(105) 13(93) 1048(763)</p>	<p>3 S. "E" St. & Auto Center Rd. / W. Orange Show Rd.</p> <p>202(437) 230(389) 74(189) 68(198) 574(1155) 98(251)</p> <p>429(318) 1345(1043) 808(434)</p> <p>137(402) 201(483) 119(163)</p>	<p>4 S. Arrowhead Av. & W. Orange Show Rd.</p> <p>321(535) 12(15) 176(276) 182(182) 402(883) 5(13)</p> <p>418(316) 1062(1030) 8(12)</p> <p>0(26) 1(19) 4(20)</p>	<p>5 S. Washington Av. & W. Orange Show Rd.</p> <p>8(14) 3(2) 14(11) 22(17) 503(1071) 4(5)</p> <p>59(39) 1367(1531) 23(19)</p> <p>11(30) 4(5) 0(9)</p>
<p>6 Washington Av. & Dwy. 1</p> <p>Intersection Does Not Exist</p>	<p>7 Washington Av. & Dumas St.</p> <p>0(0) 29(23) 13(33) 0(0)</p> <p>0(0) 0(0)</p>	<p>8 I-10 EB Ramps & E. Redlands Bl.</p> <p>765(421) 364(142) 802(640) 616(791) 41(27)</p> <p>569(905) 39(20)</p> <p>26(78)</p>	<p>9 S. Waterman Av. & E. Orange Show Rd.</p> <p>107(155) 826(957) 101(143) 93(119) 346(611) 141(202)</p> <p>211(242) 525(849) 369(172)</p> <p>112(272) 703(1016) 105(187)</p>	<p>10 S. Waterman Av. & E. Dumas St.</p> <p>18(9) 1391(1418)</p> <p>4(3) 13(21)</p> <p>8(16) 916(1472)</p>
<p>11 S. Waterman Av. & Dwy. 2 / Park Center Dr.</p> <p>6(3) 1073(1655) 57(10) 10(43) 1(0) 21(127)</p> <p>0(10) 0(0) 0(23)</p> <p>25(10) 889(1506) 144(15)</p>	<p>12 S. Waterman Av. & E. Hospitality Ln.</p> <p>173(186) 646(1347) 133(280) 145(169) 478(555) 498(522)</p> <p>195(211) 212(462) 168(697)</p> <p>365(361) 1099(697) 1051(949)</p>	<p>13 S. Waterman Av. & I-10 WB Ramps</p> <p>189(860) 1471(1994)</p> <p>363(622) 2515(2006)</p>	<p>14 S. Waterman Av. & I-10 EB Ramps</p> <p>154(585) 1317(1409) 1400(870)</p> <p>1478(1759) 382(548)</p>	<p>15 S. Waterman Av. & E. Redlands Bl.</p> <p>311(245) 704(744) 302(420) 205(406) 272(529) 128(251)</p> <p>629(682) 616(836) 280(199)</p> <p>70(66) 1025(1219) 186(122)</p>
<p>16 S. Carnegie Dr. & E. Hospitality Ln.</p> <p>101(147) 165(764) 18(110) 32(148) 239(519) 119(572)</p> <p>255(209) 414(1007) 164(298)</p> <p>859(453) 335(168) 74(90)</p>				

LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES

EXHIBIT 8-3: HORIZON YEAR (2040) WITH PROJECT AVERAGE DAILY TRAFFIC (ADT)

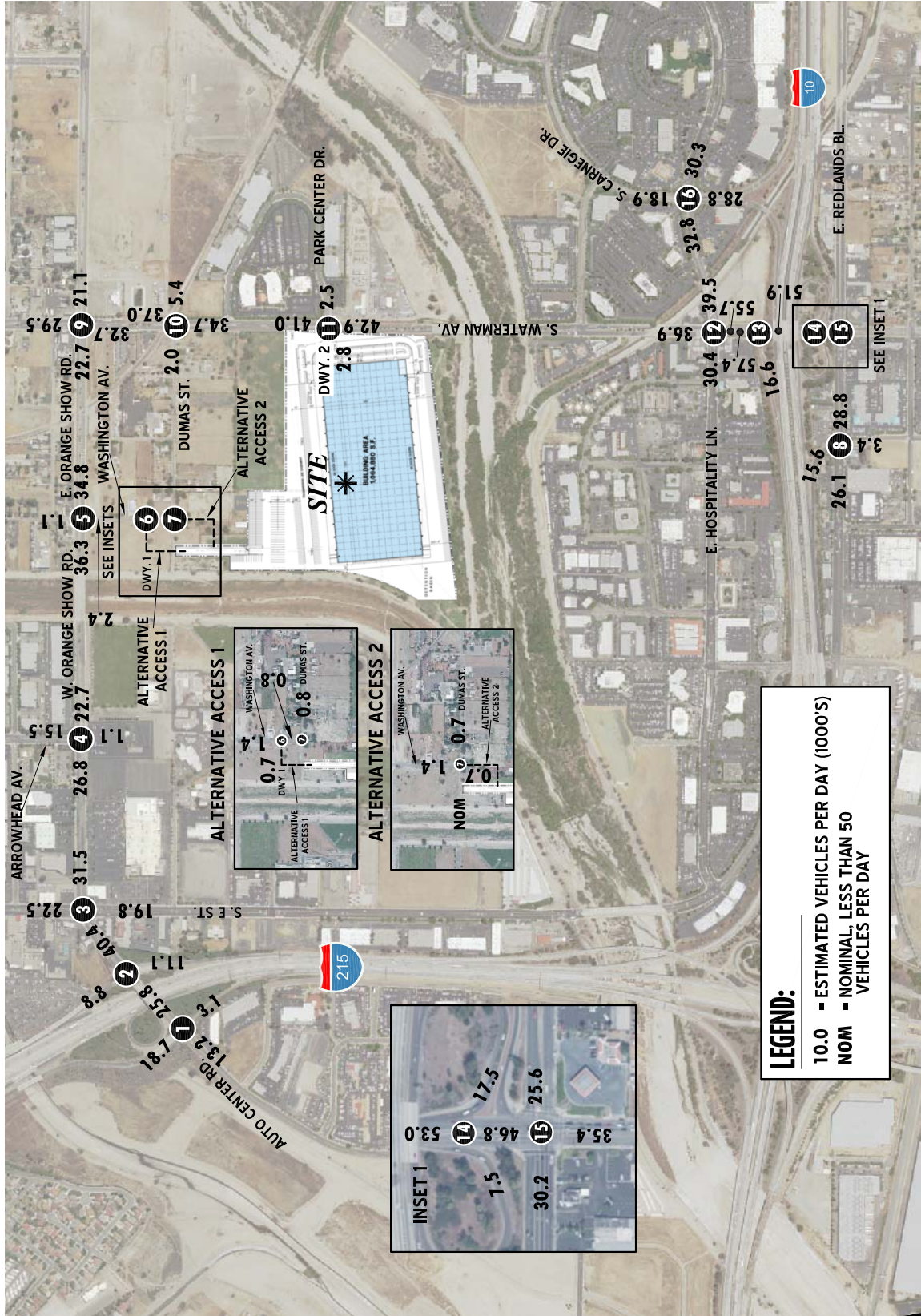


EXHIBIT 8-4: HORIZON YEAR (2040) WITH PROJECT TRAFFIC VOLUMES

1 I-215 SB Ramps & Auto Center Rd.	2 I-215 NB Ramps & Auto Center Rd.	3 S. "E" St. & Auto Center Rd. / W. Orange Show Rd.	4 S. Arrowhead Av. & W. Orange Show Rd.	5 S. Washington Av. & W. Orange Show Rd.

ALTERNATIVE ACCESS 1

6 Washington Av. & Dwy. 1	7 Washington Av. & Dumas St.

ALTERNATIVE ACCESS 2

6 Washington Av. & Dwy. 1	7 Washington Av. & Dumas St.
Not Applicable	
Not Applicable	

8 I-10 EB Ramps & E. Redlands Bl.	9 S. Waterman Av. & E. Orange Show Rd.	10 S. Waterman Av. & E. Dumas St.	11 S. Waterman Av. & Dwy. 2 / Park Center Dr.	12 S. Waterman Av. & E. Hospitality Ln.
13 S. Waterman Av. & I-10 WB Ramps	14 S. Waterman Av. & I-10 EB Ramps	15 S. Waterman Av. & E. Redlands Bl.	16 S. Carnegie Dr. & E. Hospitality Ln.	

LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES

Table 8-1

Intersection Analysis for Horizon Year (2040) Conditions

#	Intersection	Traffic Control ²	2040 Without Project						2040 With Project						Δ v/c		Significant Impact? ⁵
			Delay ¹ (secs.)		LOS ⁷		Average v/c ^{3,6}		Delay ¹ (secs.)		LOS ⁷		Average v/c ³		Difference ⁶		
			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	
1	I-215 SB Ramps / Auto Center Rd.	TS	46.8	13.6	D	B	0.74	--	51.2	13.7	D	B	0.75	--	0.01	--	No
2	I-215 NB Ramps / Auto Center Rd.	TS	48.4	49.2	D	D	1.03	0.95	52.6	51.3	D	D	1.04	0.97	0.01	0.02	No
3	E St. / Auto Center Rd. / Orange Show Rd. ⁴	TS	61.9	98.2	E	F	0.80	1.05	68.2	102.7	E	F	0.82	1.07	0.02	0.02	Yes
4	Arrowhead Av. / Orange Show Rd.	TS	54.4	49.9	D	D	0.63	0.69	54.5	51.5	D	D	0.64	0.71	0.01	0.02	No
5	Washington Av. / Orange Show Rd.	TS	7.2	10.4	A	B	--	--	8.2	10.4	A	B	--	--	--	--	No
6	Washington Av. / Driveway 1	CSS	Intersection Does Not Exist						8.8	9.1	A	A	--	--	--	--	No
7	Washington Av. / Dumas St.	CSS	8.7	8.8	A	A	--	--	8.7	8.8	A	A	--	--	--	--	No
	<i>Alternative Access:</i>	CSS	Not Applicable						9.2	9.5	A	A	--	--	--	--	No
8	I-10 EB Ramps / E. Redlands Bl.	TS	44.4	29.5	D	C	0.75	0.66	44.4	29.5	D	C	0.75	0.66	0.00	0.00	No
9	S. Waterman Av. / Orange Show Rd.	TS	53.4	58.8	D	E	0.87	1.24	65.6	62.3	E	E	0.88	1.25	0.01	0.01	No
10	S. Waterman Av. / Dumas St.	CSS	22.5	22.1	C	C	0.02	0.02	23.3	22.1	C	C	0.03	0.02	0.00	0.00	No
11	S. Waterman Av. / Park Center Dr.	TS	7.9	46.6	A	D	--	0.80	11.6	46.6	B	D	--	0.80	--	0.00	No
12	S. Waterman Av. / Hospitality Ln.	TS	49.0	54.1	D	D	0.86	0.96	52.4	54.8	D	D	0.87	0.96	0.01	0.00	No
13	S. Waterman Av. / I-10 WB On-Ramp	CSS	14.7	>100.0	B	F	--	1.16	14.7	>100.0	B	F	--	1.16	--	0.00	Yes ⁸
14	S. Waterman Av. / I-10 EB Ramps	CSS	0.0	0.0	A	A	--	--	0.0	0.0	A	A	--	--	--	--	No
15	S. Waterman Av. / E. Redlands Bl.	TS	54.3	122.6	D	F	1.10	1.40	54.3	122.8	D	F	1.10	1.40	0.00	0.00	No
16	I-10 WB Ramps/Carnegie Dr. / Hospitality Ln.	TS	83.6	123.9	F	F	0.79	1.08	84.3	124.4	F	F	0.80	1.08	0.01	0.00	No

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

¹ Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with a traffic signal or all-way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

² CSS = Cross-street Stop; AWS = All Way Stop; TS = Traffic Signal; **CSS** = Improvement

³ Volume to capacity ratio has been reported using the HCM 2000 methodology (as HCM 2010 does not report the overall v/c) for intersections operating at LOS C or worse, consistent with the City of San Bernardino Traffic Impact Study Guidelines.

⁴ Although there is a second northbound left turn lane, the analysis has been performed assuming a single left as vehicles headed onto the I-215 Northbound often block the inner left turn lane. As a result, the inner left turn lane does not get adequately utilized each cycle.

⁵ Significant impact has been identified if the change in v/c exceeds the applicable thresholds per the City of San Bernardino Traffic Impact Study Guidelines

⁶ The TIA Guidelines have significance criteria based on v/c difference for LOS C or worse. As such, v/c ratios and difference in v/c have not been reported for LOS "A" or LOS "B".

⁷ LOS = Level of Service

⁸ Improvements have been identified for the intersection of S. Waterman Av. / I-10 WB Ramp as the it is under the jurisdiction of Caltrans and Project contributes more than 50 peak hour trips to the intersection.

- E St./Auto Center Rd. / Orange Show Rd. (#3) – LOS E AM peak hour & LOS F PM peak hour
- S. Waterman Av. / Orange Show Rd. (#9) – LOS E PM peak hour only
- S. Waterman Av. / I-10 Westbound On-ramp (#13) – LOS F PM peak hour only
- S. Waterman Av. / E. Redlands Bl. (#15) – LOS F PM peak hour only

A summary of the peak hour intersection LOS for Horizon Year Without Project conditions are shown on Exhibit 8-5. The intersection operations analysis worksheets for Horizon Year Without Project traffic conditions are included in Appendix 8.1 of this TIA.

8.4.2 HORIZON YEAR (2040) WITH PROJECT TRAFFIC CONDITIONS

As shown on Table 8-1 and illustrated on Exhibit 8-6, the intersection analysis results indicate that the addition of Project traffic is not anticipated to result in any additional LOS deficiencies under Horizon Year (2040) With Project traffic conditions. However, the addition of Project traffic is anticipated to result in the following significant cumulative impacts based on the City's significance threshold at the following intersections:

- E St./Auto Center Rd. / Orange Show Rd. (#3)
- S. Waterman Av. / I-10 Westbound On-Ramp (#13)

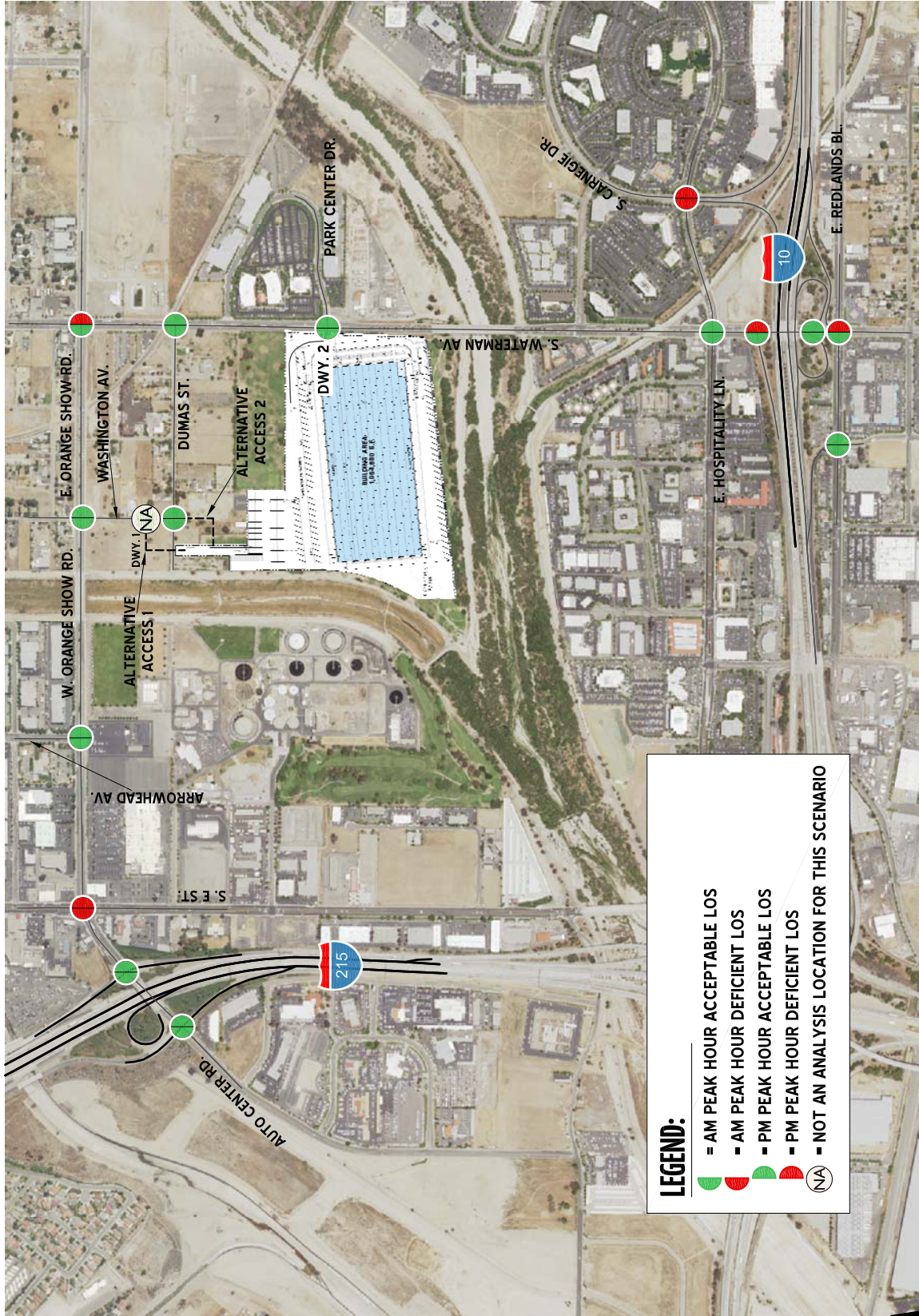
The intersection operations analysis worksheets for Horizon Year (2040) With Project traffic conditions are included in Appendix 8.2 of this TIA. Measures to address long range deficiencies for Horizon Year traffic conditions are discussed in Section 8.8 *Long Range Deficiencies and Recommended Improvements*. Improvements have been identified for the intersection of S. Waterman Av. / I-10 WB Ramp as it is under the jurisdiction of Caltrans and Project contributes more than 50 peak hour trips to the intersection. Improvements have been recommended for the intersection of S. Waterman Av. / Orange Show Road to reduce the queuing issues at the intersection.

8.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

There are no study area intersections anticipated to warrant traffic signals for Horizon Year (2040) Without Project traffic conditions (see Appendix 8.3). Similarly, there are no intersections anticipated to warrant a traffic signal under Horizon Year (2040) With Project traffic conditions (see Appendix 8.4).

However, a signal warrant defines the minimum condition under which the installation of a traffic signal might be warranted. An intersection may satisfy a signal warrant condition and operate at or above acceptable LOS or operate below acceptable LOS and not meet a signal warrant. As such, although not warranted, the installation of a traffic signal at the intersection of Waterman Avenue at the I-10 Westbound On-ramp has been recommended as the addition of lanes are not feasible at this location.

EXHIBIT 8-5: HORIZON YEAR (2040) WITHOUT PROJECT SUMMARY OF LOS



LEGEND:

- AM PEAK HOUR ACCEPTABLE LOS
- AM PEAK HOUR DEFICIENT LOS
- PM PEAK HOUR ACCEPTABLE LOS
- PM PEAK HOUR DEFICIENT LOS
- (NA) - NOT AN ANALYSIS LOCATION FOR THIS SCENARIO



EXHIBIT 8-6: HORIZON YEAR (2040) WITH PROJECT SUMMARY OF LOS

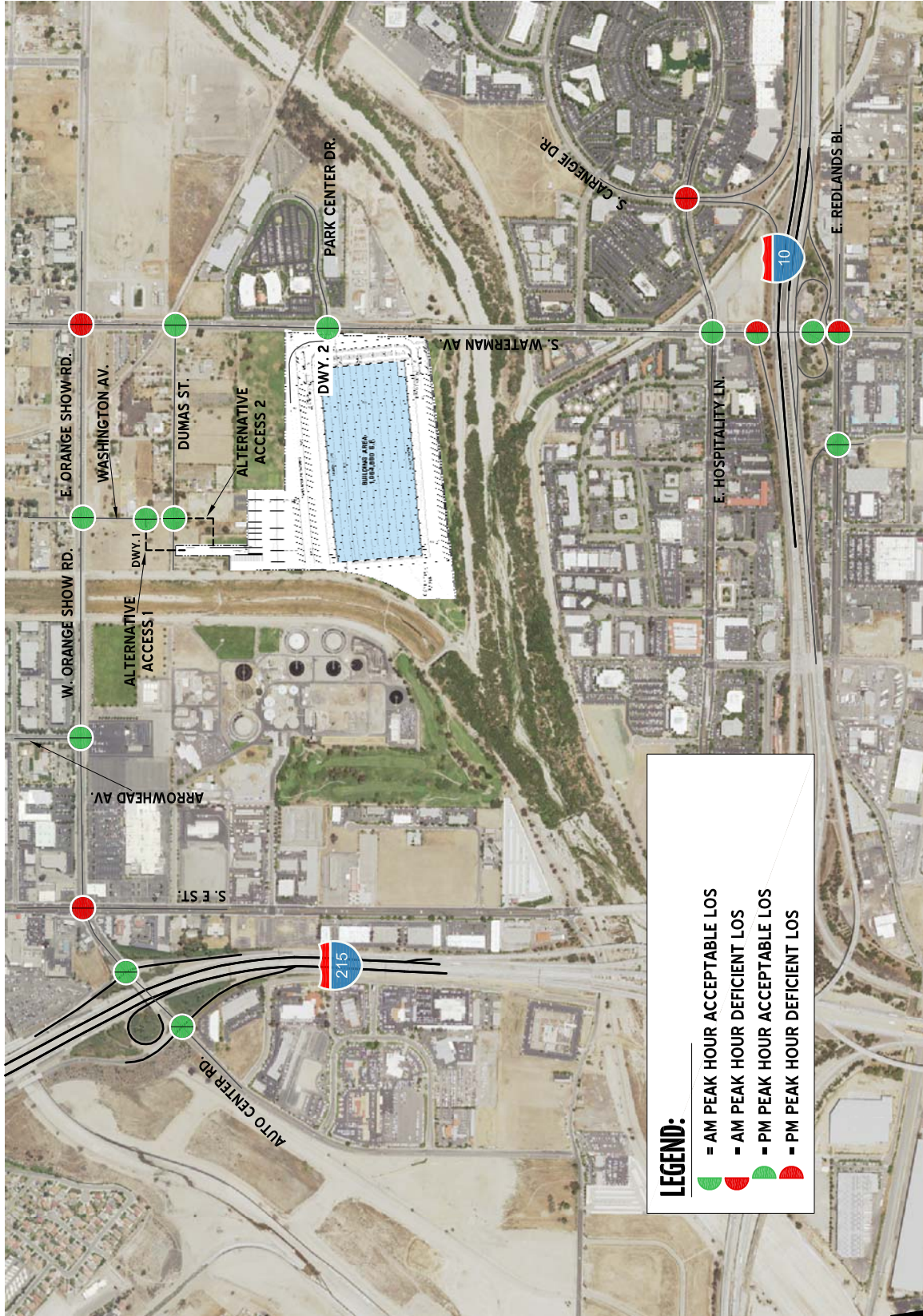


Table 8-2

Peak Hour Freeway Off-Ramp Queuing Summary for Horizon Year (2040) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	2040 Without Project				2040 With Project			
			95th Percentile Queue (Feet)		Acceptable? ¹		95th Percentile Queue (Feet)		Acceptable? ¹	
			AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
I-215 SB Off-Ramp / Auto Center Rd.	SBL	2,695	522 ²	255 ²	Yes	Yes	533 ²	267 ²	Yes	Yes
	SBL/T	2,230	515 ²	250	Yes	Yes	528 ²	252	Yes	Yes
	SBR	465	78	30	Yes	Yes	78	30	Yes	Yes
I-215 NB Off-Ramp / Auto Center Rd.	NBL	925	145	63	Yes	Yes	145	63	Yes	Yes
	NBL/T	1,050	145	67	Yes	Yes	145	67	Yes	Yes
	NBR	275	390 ²	182	Yes ³	Yes	405 ²	188	Yes ³	Yes
I-10 EB Off-Ramp / E. Redlands Bl.	SBL	100	550	406 ²	No	Yes ⁴	550	406	No	Yes ⁴
	SBL/T	845	540	395 ²	Yes	Yes	540	395	Yes	Yes
	SBR	215	623²	199	No	Yes ⁴	623²	199	No	Yes ⁴
I-10 WB Off-Ramp / E. Hospitality Ln.	NBL	800	485 ²	258	Yes	Yes	504 ²	265	Yes	Yes
	NBT	1,575	536 ²	715 ²	Yes	Yes	536 ²	716 ²	Yes	Yes
	NBR	160	105	227	Yes	Yes ⁴	105	227	Yes	Yes ⁴

¹ Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided.

² 95th percentile volume exceeds capacity, queue may be longer

³ Although the 95th percentile queue is anticipated to exceed the available storage for the turn lane, the adjacent through lane has sufficient storage to accommodate any spillover without spilling back and affecting the I-215 Freeway mainline.

⁴ Although the 95th percentile queue is anticipated to exceed the available storage for the turn lane, the adjacent through lane has sufficient storage to accommodate any spillover without spilling back and affecting the I-10 Freeway mainline.

8.6 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-215 Freeway and Auto Center Drive, I-10 Freeway and E. Redlands Boulevard, and I-10 Freeway and Hospitality Lane interchanges to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially “spill back” onto the I-215 Freeway and I-10 Freeway mainline. Queuing analysis findings are presented in Table 8-2 for Horizon Year (2040) traffic conditions. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline.

As shown on Table 8-2, the southbound left-turn lane southbound right-turn lane at the I-10 Eastbound Off-ramp and E. Redlands Boulevard is anticipated to experience queuing issues during the weekday AM peak 95th percentile traffic flows for both Horizon Year (2040) Without and With Project traffic conditions.

Worksheets for Horizon Year (2040) Without and With Project conditions off-ramp queuing analysis are provided in Appendix 8.5 and 8.6, respectively.

8.7 QUEUING ANALYSIS AT WATERMAN AVENUE AND ORANGE SHOW ROAD

A queuing analysis was performed at the intersection for Waterman Avenue and Orange Show Road to assess vehicle queues that could potentially queue back to the at-grade railroad crossing on Orange Show Road, just west of Waterman Avenue and on Waterman Avenue, south of Orange Show Road. Queuing analysis findings are presented in Table 8-3 for Horizon Year (2040) With Project traffic conditions. It is important to note that the lengths and distances are consistent with the measured distance between the intersection and the railroad. As shown on Table 8-3, the eastbound direction is anticipated to experience queuing issues during the PM peak hour. Although the PM peak hour 95th percentile queue is anticipated to extend beyond the existing railroad crossing, there are currently existing crossing arms in place to prevent vehicles from spilling onto the tracks. It is recommended that railroad preemption be applied to the traffic signal at Waterman Avenue and Orange Show Road to ensure existing queues are cleared before the crossing arms are closed.

Worksheets for Horizon Year (2040) With Project conditions queuing analysis at the intersection of Waterman Avenue and Orange Show Road are provided in Appendix 8.7. Worksheets for Horizon Year (2040) With Project conditions with improvements queuing analysis at the intersection of Waterman Avenue and Orange Show Road are provided in Appendix 8.8.

8.8 LONG RANGE DEFICIENCIES AND RECOMMENDED IMPROVEMENTS

This section provides a summary of cumulative impacts and recommended improvements. Improvement strategies have been recommended at intersections that have been identified as deficient in an effort to reduce each location’s peak hour delay and improve the associated LOS grade to an acceptable LOS (LOS D or better). The effectiveness of the recommended improvement strategies to address Horizon Year (2040) traffic deficiencies are presented in Table 8-4.

Table 8-3

Intersection Queuing Summary for Horizon Year (2040) With Project Conditions

Intersection	Movement	Available Stacking Distance (Feet)	95th Percentile Queue (Feet)		Acceptable? ¹	
			AM Peak	PM Peak	AM	PM
Waterman Ave. / Orange Show Road	-Without Improvements	NB	268	749	Yes	No
		EB	183	684	Yes	No
	- With Improvements	NB	285	466	Yes	Yes
		EB	181	1,656	Yes	No

¹ Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided.

Table 8-4

Intersection Analysis for Horizon Year (2040) Conditions With Improvements

#	Intersection	Traffic Control ³	Intersection Approach Lanes ¹												Delay ² (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound			AM	PM	AM	PM
			L	T	R	L	T	R	L	T	R	L	T	R				
3	E St. / Auto Center Rd. / Orange Show Rd.																	
	- 2040 Without Project																	
	- Without Improvements ⁴	TS	1	2	0	2	2	1>	2	2	1	2	2	1>	61.9	98.2	E	F
	- With Improvements ⁵	TS	<u>2</u>	2	0	2	2	1>	2	2	<u>1></u>	2	2	1>	36.3	33.8	D	C
	- 2040 With Project																	
9	S. Waterman Av. / Orange Show Rd.																	
	- 2040 Without Project																	
	- Without Improvements	TS	1	2	d	1	2	d	1	2	d	1	2	d	53.4	58.8	D	E
	- With Improvements	TS	<u>2</u>	2	<u>1</u>	1	2	d	1	2	d	1	2	d	49.7	51.8	D	D
	- 2040 With Project																	
13	S. Waterman Av. / I-10 WB On-Ramp																	
	- 2040 Without Project																	
	- Without Improvements	CSS	1	2	0	0	3	0	0	0	0	0	0	0	14.7	>100.0	B	F
	- With Improvements	<u>TS</u>	1	2	0	0	3	0	0	0	0	0	0	0	8.1	24.0	A	C
	- 2040 With Project																	
	- Without Improvements	CSS	1	2	0	0	3	0	0	0	0	0	0	0	14.7	>100.0	B	F
	- With Improvements	<u>TS</u>	1	2	0	0	3	0	0	0	0	0	0	0	8.1	24.4	A	C

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

¹ When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; d = Defacto Right Turn Lane; > = Right-Turn Overlap Phasing; >> = Free-Right Turn Lane; 1 = Improvement

² Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with a traffic signal or all-way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

³ CSS = Cross-Street Stop; TS = Traffic Signal

⁴ Although there is a second northbound left turn lane, the analysis has been performed assuming a single left as vehicles headed onto the I-215 Northbound often block the inner left turn lane. As a result, the inner left turn lane does not get adequately utilized each cycle.

⁵ Improvement includes lengthening the northbound left turn pocket as to improve the access to the inner left turn lane.

At this time, Caltrans has no fee programs or other improvement programs in place to address the deficiencies caused by development projects in the City of San Bernardino (or other neighboring jurisdictions) at the freeway-to-arterial ramp intersections. As such, no improvements have been recommended to address the Horizon Year (2040) queuing deficiencies, because there is no feasible mitigation available.

The applicant shall participate in the funding of off-site improvements, including traffic signals that are needed to serve cumulative traffic conditions through the payment of City of San Bernardino DIF (if the improvements are included in the DIF program), or on a fair share basis (if the improvements are not included in the DIF fee program). These fees shall be collected by the

City of San Bernardino, with the proceeds solely used as part of a funding mechanism aimed at ensuring that regional highways and arterial expansions keep pace with the projected population increases. Each of the improvements discussed above have been identified as being included as part of City DIF fee program or fair share contribution in Section 1.5 *Local and Regional Funding Mechanisms* of this TIA.

Worksheets for Horizon Year (2040) Without and With Project traffic conditions, with improvements, HCM calculation worksheets are provided in Appendix 8.9 and 8.10, respectively.

8.9 HORIZON YEAR (2040) CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS

Horizon Year (2040) Without Project Conditions

Horizon Year (2040) Without Project mainline directional volumes for the AM and PM peak hours are provided on Exhibit 8-7. As shown on Table 8-5, the following freeway segments were found to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for Horizon Year (2040) Without Project traffic conditions, in addition to those previously identified under Existing, E+P, EA (2018), EAP (2018), EAC (2018), and EAPC (2018) traffic conditions:

- I-215 Northbound, North of Auto Center Dr. – LOS E PM peak hour only
- I-215 Southbound, South of Auto Center Dr. – LOS E PM peak hour only

Horizon Year (2040) Without Project basic freeway segment analysis worksheets are provided in Appendix 8.11.

Horizon Year (2040) With Project Conditions

Horizon Year (2040) With Project mainline directional volumes for the AM and PM peak hours are provided on Exhibit 8-8. As shown on Table 8-5, with the addition of Project traffic, no additional freeway segments were found to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for Horizon Year (2040) With Project traffic conditions, in addition to those previously identified under Existing, E+P, EA (2018), EAP (2018), EAC (2018), EAPC (2018), and Horizon Year (2040) Without Project traffic conditions.

Horizon Year (2040) With Project basic freeway segment analysis worksheets are provided in Appendix 8.12.

Table 8-5

Basic Freeway Segment Analysis for Horizon Year (2040) Conditions

Freeway	Direction	Mainline Segment	Lanes ¹	2040 Without Project						2040 With Project									
				Volume		Truck %		Density ²		LOS		Volume		Truck %		Density ²		LOS	
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
I-215	NB	North of Auto Center Dr.	4	6,969	8,255	3%	1%	30.1	39.5	D	E	6,979	8,283	3%	1%	30.1	39.7	D	E
	SB	South of Auto Center Dr.	4	9,038	9,224	2%	2%	48.7	51.2	F	F	9,066	9,239	3%	2%	49.7	51.4	F	F
		North of Auto Center Dr.	5	8,320	6,868	4%	2%	28.3	21.9	D	C	8,344	6,880	4%	2%	28.4	21.9	D	C
I-10	WB	South of Auto Center Dr.	5	8,315	10,271	4%	3%	28.3	39.9	D	E	8,327	10,304	4%	3%	28.3	40.2	D	E
		West of Waterman Av.	4	8,975	8,030	10%	8%	52.8	40.0	F	E	9,002	8,045	10%	8%	53.2	40.2	F	E
		East of Waterman Av.	5	8,363	8,293	11%	8%	30.0	29.0	D	D	8,373	8,322	11%	8%	30.0	29.1	D	D
I-10	WB	West of Waterman Av.	4	9,953	10,634	15%	17%	80.3	118.0	F	F	9,959	10,651	15%	17%	80.5	119.2	F	F
		East of Waterman Av.	4	10,758	9,015	13%	18%	113.0	59.4	F	F	10,782	9,028	14%	18%	118.0	59.7	F	F

¹ Number of lanes are in the specified direction and is based on existing conditions. No future improvements are currently planned.

² Density is measured by passenger cars per mile per lane (pc/mi/ln).

Table 8-6

Freeway Ramp Junction Merge/Diverge Analysis for Horizon Year (2040) Conditions

Freeway	Direction	Ramp or Segment	Lanes on Freeway ¹	2040 Without Project				2040 With Project			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Density ²	LOS	Density ²	LOS	Density ²	LOS	Density ²	LOS
I-215	NB	On-Ramp at Auto Center Drive	4	31.1	D	37.3	E	31.1	D	37.6	E
		Off-Ramp at Auto Center Drive	4	14.3	B	16.4	B	14.5	B	16.4	B
	SB	Off-Ramp at Auto Center Drive	5	33.7	D	28.7	D	33.9	D	28.8	D
		Loop On-Ramp (Upstream) at Auto Center Drive	4	33.7	D	37.3	E	33.8	D	37.6	E
		Loop On-Ramp (Downstream) at Auto Center Drive	5	28.3	D	39.4	E	28.4	D	39.9	E
I-10	EB	Off-Ramp at Waterman Avenue	4	30.7	D	25.8	C	30.8	D	25.9	C
		On-Ramp at Waterman Avenue	4	29.1	F	30.5	D	29.2	F	30.8	D
	WB	On-Ramp at Waterman Avenue	4	44.3	F	50.0	F	44.3	F	50.1	F
		Off-Ramp at Waterman Avenue	4	39.7	F	31.8	F	39.7	F	31.9	F

¹ Number of lanes are in the specified direction and is based on existing conditions. No future improvements are currently planned.

² Density is measured by passenger cars per mile per lane (pc/mi/ln).

EXHIBIT 8-7: HORIZON YEAR (2040) WITHOUT PROJECT FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)



LEGEND:

← 100/200 = AM/PM PEAK HOUR VOLUMES

NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)

EXHIBIT 8-8: HORIZON YEAR (2040) WITH PROJECT FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)



LEGEND:

← 100/200 = AM/PM PEAK HOUR VOLUMES

NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)

8.10 HORIZON YEAR (2040) CONDITIONS FREEWAY MERGE/DIVERGE ANALYSIS

Horizon Year (2040) Without Project Conditions

As shown in Table 8-6, the following merge/diverge areas were found to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for Horizon Year (2040) Without Project traffic conditions, in addition to those previously identified under EA (2018), EAP (2018), EAC (2018), and EAPC (2018) traffic conditions:

- I-215 Northbound, On-Ramp at Auto Center Dr. – LOS E PM peak hour only
- I-215 Southbound, Loop On-Ramp (Upstream) at Auto Center Dr. – LOS E PM peak hour only
- I-215 Southbound, Loop On-Ramp (Downstream) at Auto Center Dr. – LOS E PM peak hour only
- I-10 Eastbound, On-Ramp at Waterman Av. – LOS F AM peak hour only
- I-10 Westbound, Off-Ramp at Waterman Av. – LOS F both peak hours

Horizon Year (2040) Without Project freeway ramp junction operations analysis worksheets are provided in Appendix 8.13. Horizon Year (2040) Without Project freeway mainline volumes are shown on Exhibit 8-7.

Horizon Year (2040) Without Project Conditions

As shown in Table 8-6, with the addition of Project traffic, no additional merge/diverge areas were found to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for Horizon Year (2040) With Project traffic conditions, in addition to those previously identified under EA (2018), EAP (2018), EAC (2018), EAPC (2018), and Horizon Year (2040) Without Project traffic conditions.

Horizon Year (2040) With Project freeway ramp junction operations analysis worksheets are provided in Appendix 8.14. Horizon Year (2040) With Project freeway mainline volumes are shown on Exhibit 8-8.

8.11 FREEWAY IMPROVEMENTS

There are no current plans to widen the I-215 freeway. The San Bernardino County Transportation Authority (SBCTA) is studying alternatives for the I-10 Corridor Project. The I-10 Corridor Project is currently in the environmental review phase. SBCTA has selected Express Lanes as the locally preferred alternative, which entails addition of two Express Lanes in each direction from Los Angeles/San Bernardino County Line to Ford Street in Redlands. However, the final alternative selection will be completed after the environmental review process.

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9 REFERENCES

1. **Department, City of San Bernardino Public Works.** *The City of San Bernardino Traffic Impact Study Guidelines.* City of San Bernardino : s.n., June 3, 2015.
2. **San Bernardino Associated Governments.** *Congestion Management Program for County of San Bernardino.* County of San Bernardino : s.n., Updated June 2016.
3. **California Department of Transportation.** *Guide for the Preparation of Traffic Impact Studies.* December 2002.
4. **Institute of Transportation Engineers.** *Trip Generation.* 9th Edition. 2012.
5. **Southern California Association of Governments.** *2016 Regional Transportation Plan/Sustainable Communities Strategy.* April 2016.
6. **Transportation Research Board.** *Highway Capacity Manual (HCM).* s.l. : National Academy of Sciences, 2010.
7. **Federal Highway Administration.** Manual on Uniform Traffic Control Devices (MUTCD). [book auth.] California Department of Transportation. *California Manual on Uniform Traffic Control Devices (CAMUTCD).* 2014.
8. **California Department of Transportation.** *Freeway Performance Measurement (PeMS).* [Online] [Cited: January 7, 2014.] <http://pems.dot.ca.gov/>.
9. **Southern California Association of Governments.** *2012 Regional Transportation Plan.* April 2012.

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APPENDIX 1.1:

APPROVED TRAFFIC STUDY SCOPING AGREEMENT

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Scope of Study Form

To be completed by applicant and approved by Development Services prior to start of study

PUBLIC WORKS

Project Name: Gateway South Building 4
 Project Address: West of Waterman Avenue at Parkcenter Drive
 Project Description: 1,064,880 square feet of high-cube warehouse/distribution center
 Developer's Name: Hillwood
 Address: 901 Via Piemonte, Suite 175, Ontario, CA 91764
 Telephone No.: 909-382-2163 Fax No.: _____
 Email Address: _____

Trip Generation Rates From: ITE 9th Ed. Other: _____

Trip Generation For: (See Tables 1 and 2)

Land Use (1) High-Cube Warehouse
 ITE Land Use Code 152
 Daily Trips 2,941
 AM Peak Hour Trips
 Inbound 119
 Outbound 52
 Total 171
 PM Peak Hour Trips
 Inbound 62
 Outbound 138
 Total 200

Land Use (2) _____
 ITE Land Use Code _____
 Daily Trips _____
 AM Peak Hour Trips
 Inbound _____
 Outbound _____
 Total _____
 PM Peak Hour Trips
 Inbound _____
 Outbound _____
 Total _____

Project Opening Year: 2018

Buildout Year: _____

Study Intersections: (See Attached Exhibit 2)

1. I-215 SB Ramps / E. Orange Show Rd.
2. I-215 NB Ramps / E. Orange Show Rd.
3. E St. / E. Orange Show Rd.
4. Arrowhead Av. / E. Orange Show Rd.
5. Washington Av. / E. Orange Show Rd.
6. Washington Av. / Dwy. 1
7. Washington Av. / Dumas St.
8. S. Waterman Av. / E. Orange Show Rd.
9. S. Waterman Av. / Dumas St.
10. S. Waterman Av. / Parkcenter Drive/Dwy. 2

11. S. Waterman Av. / E. Hospitality Ln.
12. S. Waterman Av. / I-10 WB On-Ramp
13. I-10 WB Ramps / E. Hospitality Ln.
14. *S. Waterman / E Redlands Blvd*
15. *I-10 EB off-Ramp / E Redlands Blvd*
16. _____
17. _____
18. _____
19. _____
20. _____

Ambient Growth Rate: 3 %

Trip Distribution: (See Attached Exhibits 3 and 4)

Preparer's Name: Urban Crossroads, Inc. - Aric Evatt
 Address: 41 Corporate Park, Suite 300, Irvine, CA 92606
 Telephone No.: (949) 336-5978 Fax No.: (949) 660-1911
 Email Address: aevatt@urbanxroads.com

Signature: 

Date: May 24, 2016

Approved By (Development Services Department): *PUBLIC WORKS DEPARTMENT*

Signature: 
 Name: HERNANDO COTARIGCO

Date: 6/14/16
 Title: TRAFFIC OPS & SYSTEMS ANALYST

May 24, 2016 (Revised)

Mr. Hernando Cotangco
CITY OF SAN BERNARDINO
300 North D Street
San Bernardino, CA 92418

SUBJECT: GATEWAY SOUTH BUILDING 4 TRAFFIC IMPACT ANALYSIS SCOPING AGREEMENT

Dear Mr. Hernando Cotangco:

The firm of Urban Crossroads, Inc. is pleased to provide this letter documenting the recommended scoping / assumptions for the proposed Gateway South Building 4 development (“Project”), which is located west of Waterman Avenue at Parkcenter Drive in the City of San Bernardino.

Our goal is to obtain comments from City of San Bernardino staff to ensure that the traffic study fully addresses the potential impacts of the proposed Project. The remainder of this letter describes the proposed analysis methodology, project trip generation, trip distribution, and project traffic assignment/project trips on the surrounding roadway network, which has been used to establish the draft proposed project study area. It should be noted that this scoping agreement has been prepared in accordance with the City of San Bernardino Development Services Department *Traffic Impact Study Guidelines* (“TIA guidelines”) (June 3, 2015).

PROPOSED PROJECT

The site plan for the proposed Project is shown on Exhibit 1. The proposed Project is to consist of 1,064,880 square feet of high-cube warehouse/distribution center use.

Exhibit 2 depicts the location of the proposed Project in relation to the existing roadway network. As illustrated, the Project site is located west of Waterman Avenue at Parkcenter Drive. The proposed Project is anticipated to be developed in a single phase with a projected Opening Year of 2018. Access to the Project site will be provided on Waterman Avenue via the signalized intersection at Parkcenter Drive. The Project is also proposing a second access on/near Dumas Street. The Project is considering 2 access alternatives: access across Dumas Street to loop to the east and connect with Washington Avenue to gain access to Orange Show Road, or a southern extension of Washington Avenue on Dumas Street (contingent on whether the Project can obtain the property to accommodate this access) (see Exhibit 1). Regional access to the Project site will be provided by the I-215 Freeway via Orange Show Road and the I-10 Freeway via Waterman Avenue.

TRIP GENERATION ASSUMPTIONS

Trip generation estimates for the proposed project have been developed using data from the Institute of Transportation Engineers (ITE) *Trip Generation* (9th Edition, 2012) manual. Table 1 presents the trip generation rates and trip generation summary based on actual vehicles, while PCE based trip generation rates and summary are provided on Table 2.

High-cube warehouse/distribution centers (ITE Land Use Code 152) are a unique land use type within the larger, more generalized industrial land use category. The ITE *Trip Generation* manual includes data regarding the types of vehicles that are generated (passenger cars and trucks), but provides no guidance on vehicle mix (different sizes of trucks). While trucks, as a percentage of total traffic, has been based on the ITE *Trip Generation* manual, data regarding the vehicle mix has been obtained from a separate report; the South Coast Air Quality Management District's (SCAQMD) recent Warehouse Truck Trip Study. The SCAQMD is currently recommending the use of the ITE *Trip Generation* manual in conjunction with their truck mix by axle-type to better quantify trip rates associated with local warehouse and distribution projects, as truck emission represent more than 90 percent of air quality impacts from these projects. This recommended procedure has been utilized for the purposes of this analysis in effort to be consistent with other technical studies prepared for the Project.

As noted on Table 1 and Table 2, refinements to the raw trip generation estimates have been made to provide a more detailed breakdown of trips between passenger cars and trucks. The percentage of trucks has been determined from the table shown on page 267 of the ITE *Trip Generation* manual. As shown on page 267, the truck trip generation rate for weekday daily traffic is 0.64 or 38.1% of the total traffic. Similarly, the truck trip generation rate for the weekday AM peak hour is 0.03 (27.3% of the total traffic) and 0.04 (or 33.3% of the total traffic) for the weekday PM peak hour.

Trip generation for heavy trucks was further broken down by truck type (or axle type). The total truck percentage is comprised of 3 different truck types: 2-axle, 3-axle, and 4+-axle trucks. For the purposes of this analysis, the percentage of trucks, by axle type, were obtained from the SCAQMD interim recommended truck mix. The SCAQMD has recently performed surveys of existing facilities and compiled the data to provide interim guidance on the mix of heavy trucks for these types of high-cube warehousing/distribution facilities. Based on this interim guidance from the SCAQMD, the following truck fleet mix was utilized for the purposes of estimating the truck trip generation for the site: 22.0% of the total trucks as 2-axle trucks, 17.7% of the total trucks as 3-axle trucks, and 60.3% of the total trucks as 4+-axle trucks. Lastly, PCE factors were applied to the trip generation rates for heavy trucks (large 2-axes, 3-axes, 4+-axes). PCE factors of 2.0 for 2-axle, 2.5 for 3-axle, and 3.0 for 4+-axle trucks are consistent with those recommended in the City of San Bernardino's TIA Guidelines.

As shown on Table 1, the proposed Project is anticipated to generate a net total of 1,789 trip-ends per day with 117 net AM peak hour trips and 127 net PM peak hour trips. In comparison, and as shown on

Table 2, the proposed Project is anticipated to generate a net total of 2,941 PCE trip-ends per day with 171 net PCE AM peak hour trips and 200 net PCE PM peak hour trips.

TRIP DISTRIBUTION ASSUMPTIONS

A trip distribution exhibit has been provided for both heavy trucks and passenger cars. Exhibit 3 illustrates the proposed heavy truck trip distribution patterns and Exhibit 4 illustrates the proposed passenger car trip distribution patterns. Trip distribution patterns for both heavy trucks and passenger cars are anticipated to be the same for both Opening Year Cumulative and Horizon Year (2040) traffic conditions.

PROPOSED STUDY AREA INTERSECTIONS

Per the City of San Bernardino traffic study guidelines, intersections where the Project is expected to add at least 50 peak hour trips should be analyzed. Based on this criterion, the anticipated trip generation and trip distribution patterns, the following intersections are proposed to be evaluated (see Exhibit 2):

1. I-215 Freeway Southbound Ramps / E. Orange Show Road
2. I-215 Freeway Northbound Ramps / E. Orange Show Road
3. E Street / E. Orange Show Road
4. Arrowhead Avenue / E. Orange Show Road
5. Washington Avenue / E. Orange Show Road
6. Driveway 1 / Dumas Street or Washington Avenue / Driveway 1
7. Washington Avenue / Dumas Street
8. S. Waterman Avenue / E. Orange Show Road
9. S. Waterman Avenue / Dumas St.
10. S. Waterman Avenue / Parkcenter Drive
11. S. Waterman Avenue / E. Hospitality Lane
12. S. Waterman Avenue / I-10 Westbound On-Ramp
13. I-10 Westbound Ramps / E. Hospitality Lane

AMBIENT GROWTH ASSUMPTIONS

The ambient growth rate is 3% per year, compounded over 2 years, for a total of 6.09%.

ANALYSIS SCENARIOS

Consistent with the TIA guidelines, intersection analysis will be performed for the following analysis scenarios:

- Existing (2016) Conditions
- Existing plus Project (Project Buildout) Conditions
- Existing plus Ambient Growth (2018) Conditions
- Existing plus Ambient Growth plus Project (2018) Conditions
- Existing plus Ambient Growth plus Cumulative (2018) Conditions
- Existing plus Ambient Growth plus Project plus Cumulative (2018) Conditions
- Horizon Year (2040) Without Project Conditions
- Horizon Year (2040) With Project Conditions

Year 2040 conditions will be based on forecasted data from the County of San Bernardino Association of Governments (SANBAG) Transportation Analysis Mode (SBTAM).

INTERSECTION ANALYSIS METHODOLOGY

For the purposes of this analysis, signalized intersection operations analysis will be based on the methodology described in the *Highway Capacity Manual* (2010). Intersection LOS operations are based on an intersection's average control delay. Unsignalized intersections will be evaluated using the methodology described in the HCM 2010. At two-way or side-street stop-controlled intersections, LOS is calculated for each controlled movement and for the left turn movement from the major street, as well as for the intersection as a whole. For approaches composed of a single lane, the delay is computed as the average of all movements in that lane.

Consistent with Appendix C, Page C-13 of the San Bernardino County Congestion Management Program (CMP), the following saturation flow rates, in vehicles per hour green per lane (vphgpl), will be utilized in the traffic analysis for signalized intersections:

Existing and Near-Term Traffic Conditions:

- Exclusive through: 1800 vphgph
- Exclusive left: 1700 vphgph
- Exclusive right: 1800 vphgph
- Exclusive dual left: 1600 vphgph
- Exclusive triple left: 1500 vphgph

Horizon Year (2040) Traffic Conditions:

- Exclusive through: 1900 vphgph
- Exclusive left: 1800 vphgph
- Exclusive dual left: 1700 vphgph
- Exclusive right: 1900 vphgph
- Exclusive dual right: 1800 vphgph
- Exclusive triple left: 1600 vphgph or less

LEVEL OF SERVICE CRITERIA

The definition of an intersection deficiency in the City of San Bernardino is based on the City of San Bernardino General Plan Circulation Element. The City of San Bernardino General Plan states that target LOS D be maintained at City intersections wherever possible.

THRESHOLD OF SIGNIFICANCE

The City of San Bernardino TIA Guidelines identifies a “significant” traffic impact at an intersection when any of the following changes in the volume to capacity (v/c) ratios occur between the “without Project” and the “with Project” conditions:

<u>LOS</u> <u>Without Project</u>	<u>V/C</u> <u>Difference</u>
C	> 0.0400
D	> 0.0200
E, F	> 0.0100

Mitigation measures for direct Project impacts identified under Existing plus Project conditions would only mitigate the Project’s proportional change in delay or v/c ratio to pre-Project conditions or better. Mitigation measures will be identified for intersections that show a significant cumulative impact per the above changes in v/c, and operate at LOS D or worse under Existing plus Ambient Growth plus Project plus Cumulative (2017) and Horizon Year (2040) with Project traffic conditions. The LOS with mitigation must be improved to LOS D or better for intersections.

It should be noted that the HCM 2000 methodology will be utilized to report v/c as Synchro (analysis software) does not report the average v/c for the HCM 2010 methodology.

FAIR SHARE CALCULATION METHODOLOGY

The following equation will be used to calculate the Project's fair share:

$$\text{Fair Share \%} = \frac{\text{Project Total trips}}{2040 \text{ Net New Traffic}}$$

SPECIAL ISSUES

The following special issues will be addressed in the traffic study:

- Queuing analysis at the site adjacent intersections/Project driveways to determine adequate storage lengths.
- Truck access evaluation to determine if driveways are designed to accommodate the turning radius of heavy trucks.

CUMULATIVE DEVELOPMENTS

Exhibit 5 illustrates a cumulative development location map. A land use summary of the cumulative development projects are shown on Table 3. It is requested that the City provide a list of any additional cumulative development projects for inclusion in the traffic study.

If you have any questions or comments, I can be reached at (949) 336-5978.

URBAN CROSSROADS, INC.



Aric Evatt, PTP
President



Charlene So, PE
Senior Transportation Engineer

Attachments

EXHIBIT 1: PRELIMINARY SITE PLAN

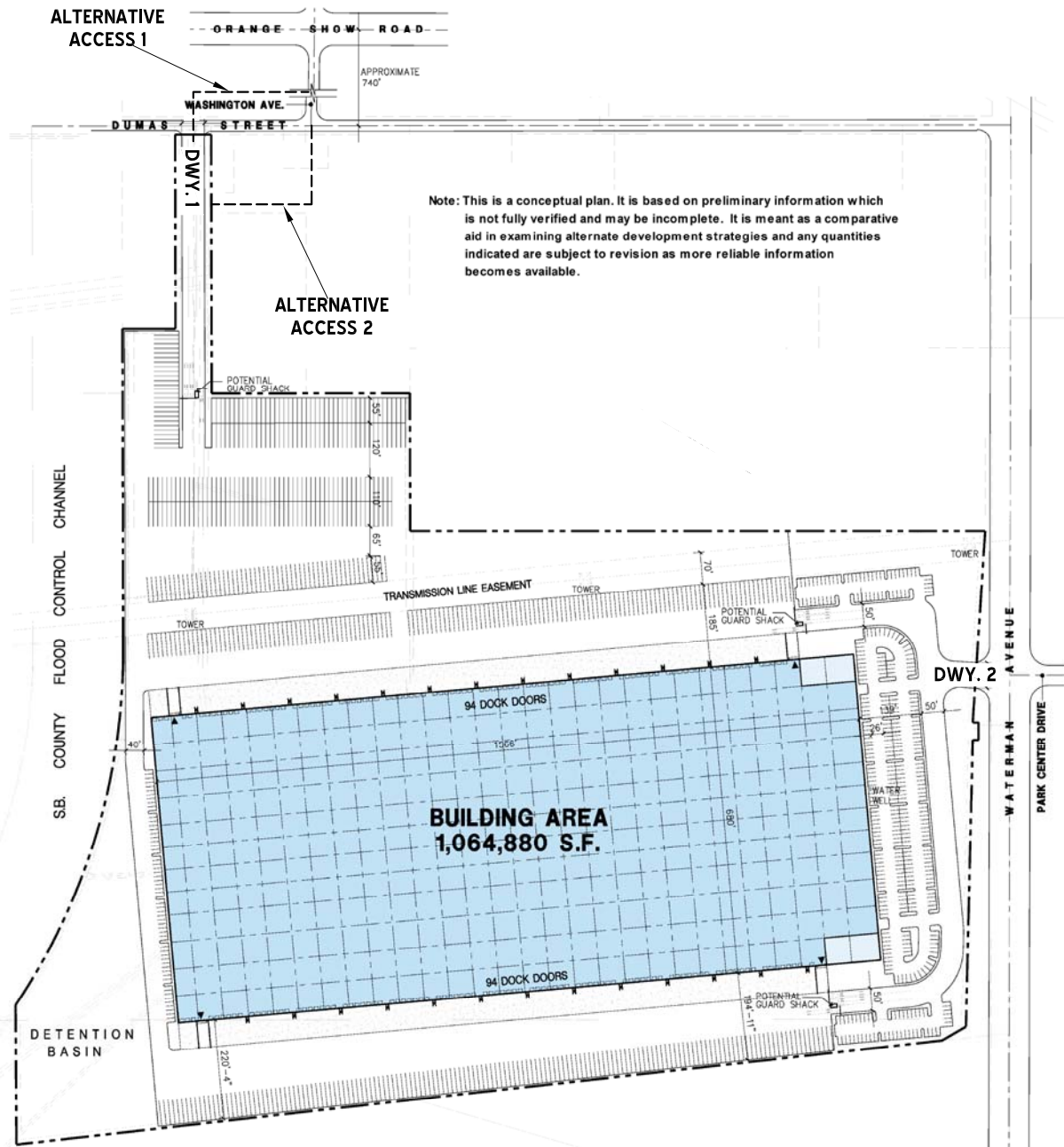


EXHIBIT 2: LOCATION MAP

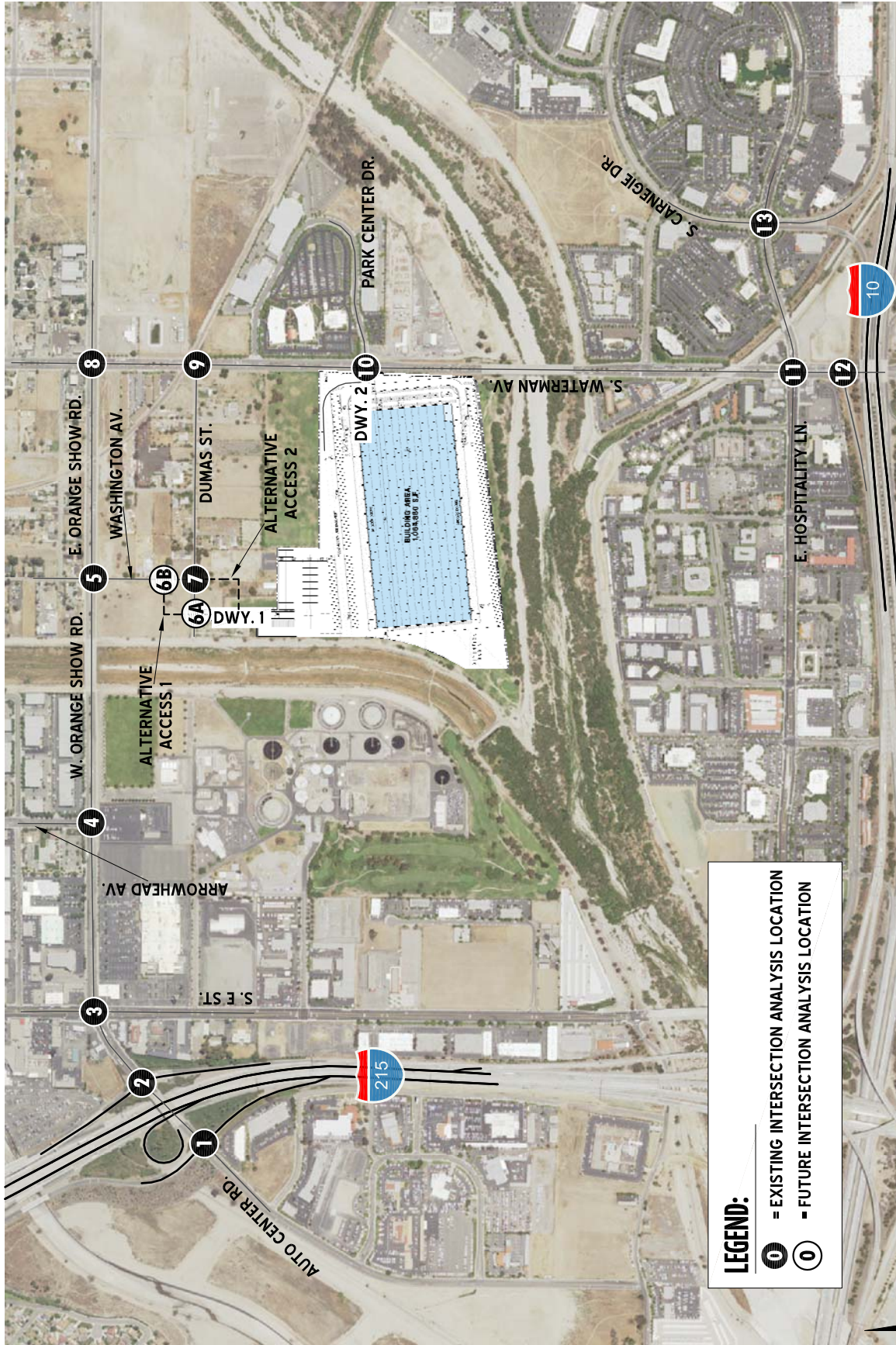


EXHIBIT 3: PROJECT (TRUCKS) TRIP DISTRIBUTION



EXHIBIT 4: PROJECT (PASSENGER CAR) TRIP DISTRIBUTION

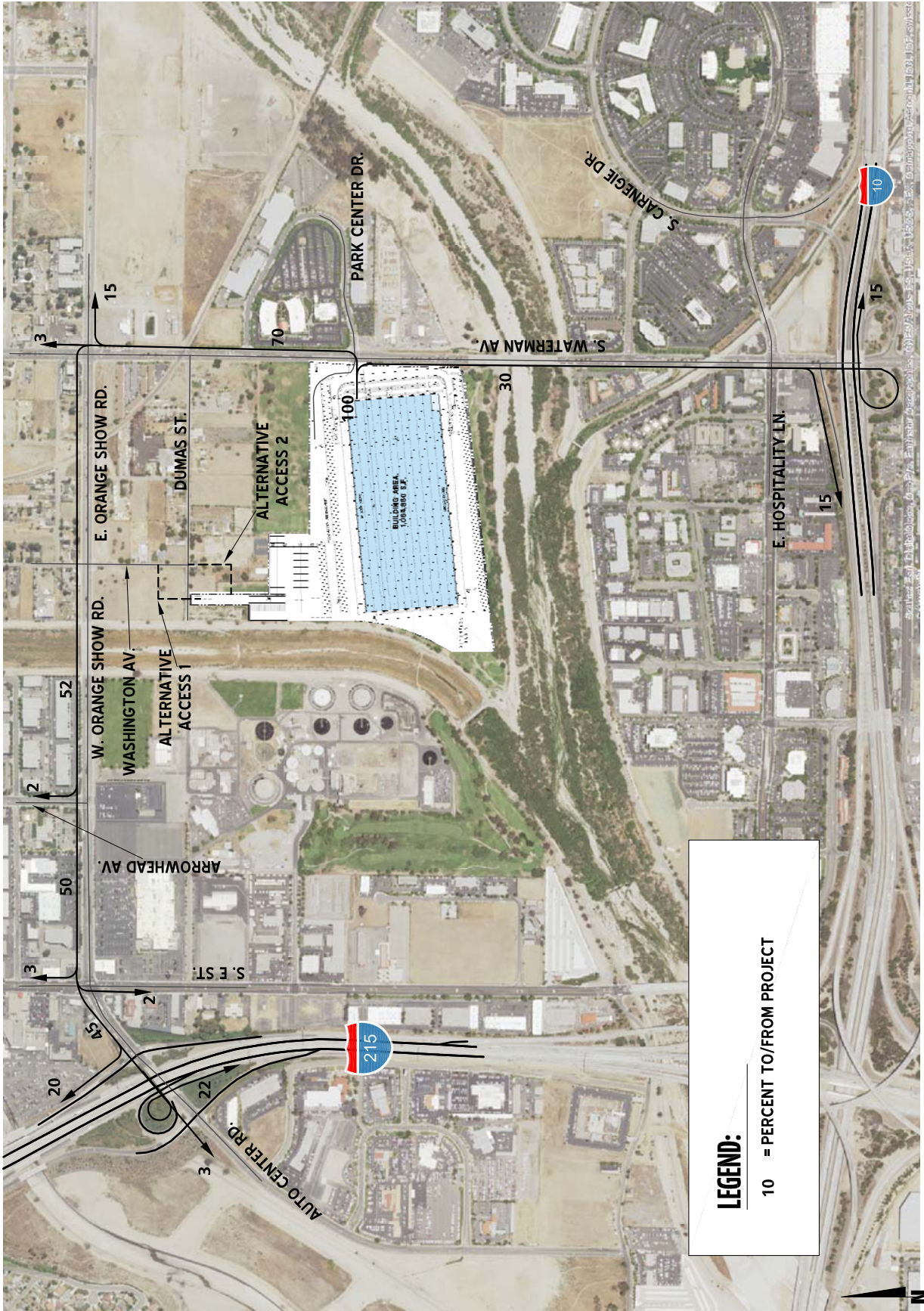


EXHIBIT 5: CUMULATIVE DEVELOPMENT LOCATION MAP

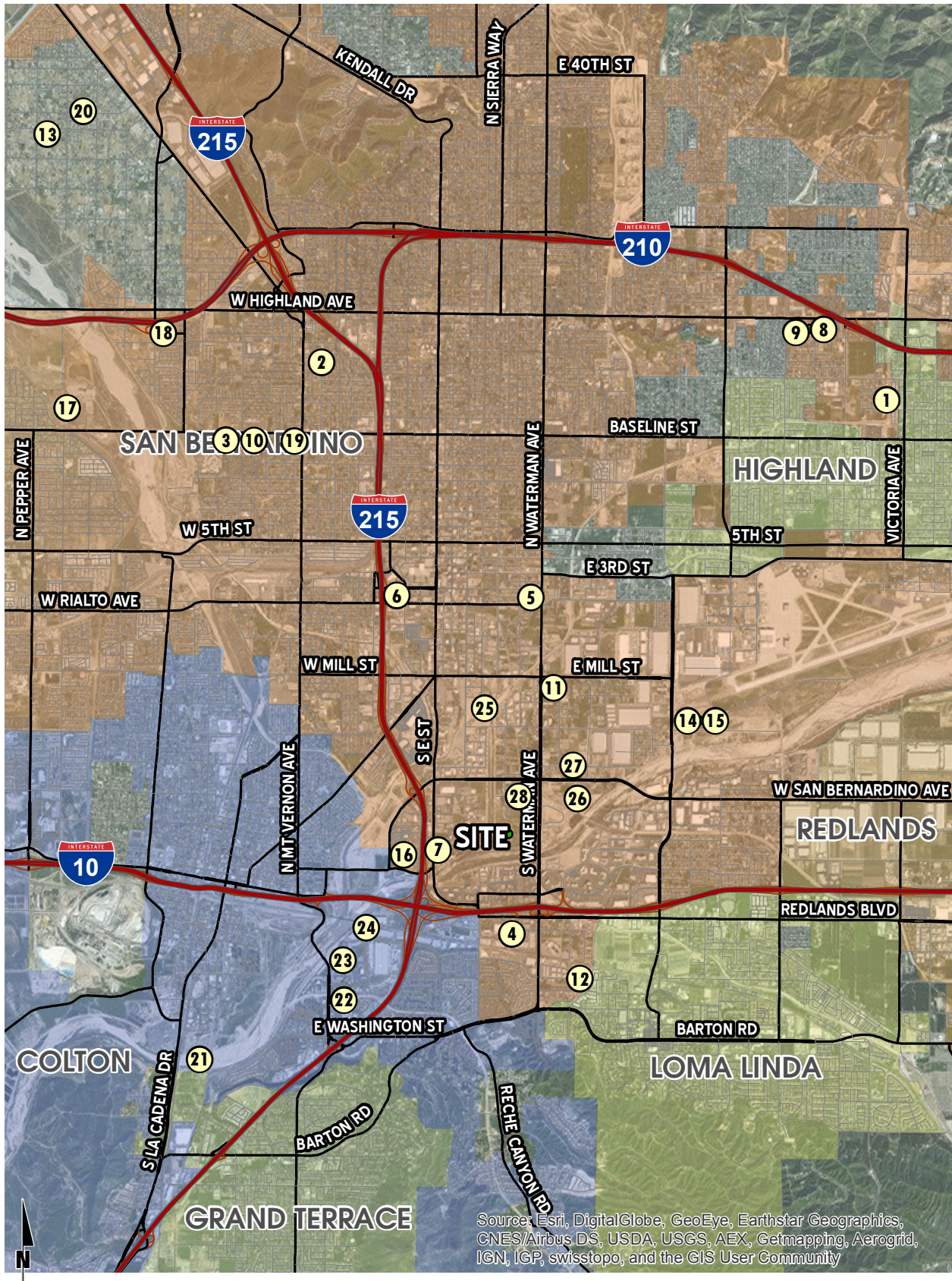


Table 1

Project Trip Generation Summary (Actual Vehicles)

Land Use	Units ²	ITE LU Code	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Trip Generation Rates¹									
High-Cube Warehouse ³	TSF	152	0.076	0.034	0.110	0.037	0.083	0.120	1.680
		Passenger Cars	0.055	0.025	0.080	0.025	0.055	0.080	1.040
		2-Axle Trucks	0.005	0.002	0.007	0.003	0.006	0.009	0.141
		3-Axle Trucks	0.004	0.002	0.005	0.002	0.005	0.007	0.113
		4-Axle+ Trucks	0.012	0.006	0.018	0.007	0.017	0.024	0.386

Land Use	Quantity	Units ²	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Trip Generation Summary									
High-Cube Warehouse	1,064.880	TSF							
Passenger Cars:			59	26	85	26	59	85	1,107
Truck Trips:									
2-axle:			5	2	7	3	6	9	150
3-axle:			4	2	6	2	5	7	121
4+-axle:			13	6	19	8	18	26	411
- Net Truck Trips (Actual Trucks) ⁴			22	10	32	13	29	42	682
TOTAL NET TRIPS (Actual Vehicles)⁵			81	36	117	39	88	127	1,789

¹ Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, Ninth Edition (2012).

² TSF = thousand square feet

³ Vehicle Mix Source: Total truck percentage source from ITE Trip Generation manual. Truck mix (by axle type) source from SCAQMD.

AM peak hour = 72.7% passenger cars, 6.01% 2-Axle trucks, 4.83% 3-Axle trucks, 16.46% 4-Axle trucks

PM peak hour = 66.7% passenger cars, 7.33% 2-Axle trucks, 5.89% 3-Axle trucks, 20.08% 4-Axle trucks

ADT = 61.9% passenger cars, 8.38% 2-Axle trucks, 6.74% 3-Axle trucks, 22.98% 4-Axle trucks

⁴ Vehicle Mix Source: Total truck percentage source from ITE Trip Generation manual. Truck mix (by axle type) source from SCAQMD for high-cube warehouse use and from the City of Fontana Truck Trip Generation Study for warehousing and general light industrial uses.

⁵ TOTAL NET TRIPS (Actual Vehicles) = Passenger Cars + Net Truck Trips (Actual Trucks).

Table 2

Project Trip Generation Summary (PCE)

Land Use	Units ²	ITE LU Code	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Trip Generation Rates¹									
High-Cube Warehouse ³	TSF	152	0.076	0.034	0.110	0.037	0.083	0.120	1.680
	Passenger Cars		0.055	0.025	0.080	0.025	0.055	0.080	1.040
	2-Axle Trucks (PCE = 2.0)		0.009	0.004	0.013	0.005	0.012	0.018	0.282
	3-Axle Trucks (PCE = 2.5)		0.009	0.004	0.013	0.005	0.012	0.018	0.283
	4-Axle+ Trucks (PCE = 3.0)		0.037	0.017	0.054	0.022	0.050	0.072	1.158

Land Use	Quantity	Units ²	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Trip Generation Summary									
High-Cube Warehouse	1,064.880	TSF							
Passenger Cars:			59	26	85	26	59	85	1,107
Truck Trips:									
2-axle:			10	4	14	6	13	19	300
3-axle:			10	4	14	6	13	19	301
4+-axle:			40	18	58	24	53	77	1,233
- Net Truck Trips (PCE) ⁴			60	26	86	36	79	115	1,834
TOTAL NET TRIPS (PCE)⁵			119	52	171	62	138	200	2,941

¹ Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, Ninth Edition (2012).

² TSF = thousand square feet

³ Vehicle Mix Source: Total truck percentage source from ITE Trip Generation manual. Truck mix (by axle type) source from SCAQMD.

AM peak hour = 72.7% passenger cars, 6.01% 2-Axle trucks, 4.83% 3-Axle trucks, 16.46% 4-Axle trucks

PM peak hour = 66.7% passenger cars, 7.33% 2-Axle trucks, 5.89% 3-Axle trucks, 20.08% 4-Axle trucks

ADT = 61.9% passenger cars, 8.38% 2-Axle trucks, 6.74% 3-Axle trucks, 22.98% 4-Axle trucks

⁴ Vehicle Mix Source: Total truck percentage source from ITE Trip Generation manual. Truck mix (by axle type) source from SCAQMD for high-cube warehouse use and from the City of Fontana Truck Trip Generation Study for warehousing and general light industrial uses. PCE rates are per the City's Traffic Study Guidelines.

⁵ TOTAL NET TRIPS (PCE) = Passenger Cars + Net Truck Trips (PCE).

Table 3

Land Use Summary of Cumulative Development Projects

TAZ	Project Name	Land Use ¹	Quantity	Units ²
1	CUP 12-04	Religious Facility Addition	0.714	TSF
2	CUP 12-06	Commercial Retail	9.180	TSF
		Fast Food w/ Drive Thru	2.400	TSF
3	CUP 12-12	K-6 Charter School	300	STU
4	CUP 12-13	Auditorium, Community Center	20.000	TSF
5	CUP 12-14	Discount Store	9.026	TSF
6	CUP 12-20	Discount Store	10.500	TSF
7	CUP 12-22	Auditorium, Banquet Hall	5.233	TSF
		Restaurant	0.800	TSF
8	CUP 13-01	Discount Store	26.907	TSF
9	CUP 13-07	Discount Store	12.500	TSF
10	CUP 13-14	Gas Station w/ Convenience Market	2.789	TSF
11	DP2 12-02	Warehousing	345.802	TSF
12	DP2 12-03	Automobile Parts and Service Center	24.953	TSF
13	DP2 12-09	Industrial Park	1,789.990	TSF
14	DP2 12-10	General Light Industrial	480.570	TSF
15	DP2 12-14	General Light Industrial	871.900	TSF
16	DP2 12-18	Automobile Dealership	30.300	TSF
17	DP-D13-01	Shipping Container Storage Yard	12	AC
18	DP-D13-02	Discount Store	12.406	TSF
19	DP-D13-05	Commercial Retail	9.180	TSF
20	Spring Trails Specific Plan	SFDR	304	DU
21	Soil Safe Land Improvement Project	Soil Safe Project	19	AC
22	Education/Office Building	General Office	114.071	TSF
23	Pacific Rail - Metal Shredder	Metal Shredder	1	MS
24	Steel Road/Santa Ana	Industrial Park	159.276	TSF
25	National Orange Show Industrial	High-Cube Warehouse	616.000	TSF
		General Light Industrial	57.750	TSF
		Warehousing	78.960	TSF
26	Alliance California Gateway South	High-Cube Warehouse	1199.360	TSF
27	Orange Show Road Warehouse	High-Cube Warehouse	342.000	TSF
28	Waterman Industrial Center	High-Cube Warehouse	564.652	TSF

¹ SFDR = Single Family Detached Residential

² DU = Dwelling Units; TSF = Thousand Square Feet; STU = Students; AC = Acres; MS = Metal Shredder

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APPENDIX 1.2:
SITE ADJACENT QUEUING ANALYSIS WORKSHEETS

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Queuing and Blocking Report
 2040 WP - AM Peak Hour WITH IMPROVEMENTS

3/28/2017

Intersection: 6: Washington Av. & Driveway 1

Movement	EB
Directions Served	LR
Maximum Queue (ft)	36
Average Queue (ft)	8
95th Queue (ft)	31
Link Distance (ft)	217
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: Alt. Driveway 1/Washington Av. & Dumas St.

Movement	SB
Directions Served	LTR
Maximum Queue (ft)	35
Average Queue (ft)	18
95th Queue (ft)	43
Link Distance (ft)	240
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 10: Waterman Av. & Dumas St.

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	TR
Maximum Queue (ft)	35	44	35	282	287	309
Average Queue (ft)	3	11	9	48	57	65
95th Queue (ft)	17	36	31	196	214	232
Link Distance (ft)	1474	1474		1130	657	657
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			75			
Storage Blk Time (%)				4		
Queuing Penalty (veh)				0		

Queuing and Blocking Report
 2040 WP - AM Peak Hour WITH IMPROVEMENTS

3/28/2017

Intersection: 11: Waterman Av. & Driveway 2/Park Center Dr.

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	T	R	L	T	TR
Maximum Queue (ft)	73	54	29	146	212	194	128	81	165	192
Average Queue (ft)	26	18	6	34	84	69	18	28	62	79
95th Queue (ft)	58	47	24	84	176	159	65	61	141	166
Link Distance (ft)	216	975	975		1497	1497			1130	1130
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)				145			110	190		
Storage Blk Time (%)					3	5			0	
Queuing Penalty (veh)					3	7			0	

Zone Summary

Zone wide Queuing Penalty: 10

Queuing and Blocking Report
 2040 WP - PM Peak Hour WITH IMPROVEMENTS

3/28/2017

Intersection: 6: Washington Av. & Driveway 1

Movement	EB
Directions Served	LR
Maximum Queue (ft)	31
Average Queue (ft)	19
95th Queue (ft)	43
Link Distance (ft)	217
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: Alt. Driveway 1/Washington Av. & Dumas St.

Movement	SB
Directions Served	LTR
Maximum Queue (ft)	31
Average Queue (ft)	13
95th Queue (ft)	38
Link Distance (ft)	240
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 10: Waterman Av. & Dumas St.

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	TR
Maximum Queue (ft)	18	52	46	322	277	284
Average Queue (ft)	2	14	12	45	47	49
95th Queue (ft)	14	42	38	192	184	185
Link Distance (ft)	1474	1474		1130	657	657
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			75			
Storage Blk Time (%)				3		
Queuing Penalty (veh)				1		

Queuing and Blocking Report
 2040 WP - PM Peak Hour WITH IMPROVEMENTS

3/28/2017

Intersection: 11: Waterman Av. & Driveway 2/Park Center Dr.

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LT	R	L	T	T	R	L	T	TR
Maximum Queue (ft)	151	138	54	190	1512	1512	230	35	319	343
Average Queue (ft)	67	61	19	93	1512	1512	63	8	165	177
95th Queue (ft)	118	111	45	246	1512	1512	232	28	267	281
Link Distance (ft)	216	975	975		1497	1497			1130	1130
Upstream Blk Time (%)	0				100	99				
Queuing Penalty (veh)	0				0	0				
Storage Bay Dist (ft)				145			110	190		
Storage Blk Time (%)					100	100			4	
Queuing Penalty (veh)					38	15			0	

Zone Summary

Zone wide Queuing Penalty: 54

APPENDIX 3.1:

EXISTING TRAFFIC COUNTS – MARCH 2017

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Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Road
 Weather: Clear

File Name : 01-SBC215SAUJAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	I-215 Southbound Off Ramp Southbound					Auto Center Road Westbound					I-215 Southbound On Ramp Northbound					Auto Center Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	144	9	46	15	199	0	40	47	0	87	0	0	0	0	0	0	26	14	6	40	21	326	347
07:15 AM	267	11	75	13	363	0	34	40	0	74	0	0	0	0	0	0	28	4	0	32	13	459	472
07:30 AM	218	27	78	20	323	0	43	62	0	105	0	0	0	0	0	0	24	6	3	30	23	458	481
07:45 AM	269	12	100	32	381	1	47	42	0	90	0	0	0	0	0	0	35	6	1	41	33	512	545
Total	898	59	299	80	1256	1	164	191	0	356	0	0	0	0	0	0	113	30	10	143	90	1755	1845
08:00 AM	246	13	83	34	342	0	53	55	0	108	0	0	0	0	0	0	29	11	3	40	37	490	527
08:15 AM	125	3	51	17	179	0	58	52	0	110	0	0	0	0	0	0	26	22	3	48	20	337	357
08:30 AM	129	1	49	13	179	1	43	52	0	96	0	0	0	0	0	0	42	19	9	61	22	336	358
08:45 AM	157	2	55	16	214	0	67	58	0	125	0	0	0	0	0	0	45	13	2	58	18	397	415
Total	657	19	238	80	914	1	221	217	0	439	0	0	0	0	0	0	142	65	17	207	97	1560	1657
Grand Total	1555	78	537	160	2170	2	385	408	0	795	0	0	0	0	0	0	255	95	27	350	187	3315	3502
Approach %	71.7	3.6	24.7			0.3	48.4	51.3			0	0	0	0	0	0	72.9	27.1					
Total %	46.9	2.4	16.2		65.5	0.1	11.6	12.3		24	0	0	0	0	0	0	7.7	2.9		10.6	5.3	94.7	
Passenger Vehicles	1468	75	519		2217	2	364	353		719	0	0	0	0	0	0	232	84		338	0	0	3274
% Passenger Vehicles	94.4	96.2	96.6		95.2	100	94.5	86.5		90.4	0	0	0	0	0	0	91	88.4		81.5	89.7	0	93.5
Large 2 Axle Vehicles	66	1	11		82	0	9	24		33	0	0	0	0	0	0	6	1		7	0	0	122
% Large 2 Axle Vehicles	4.2	1.3	2		3.5	0	2.3	5.9		4.2	0	0	0	0	0	0	2.4	1.1		1.9	0	0	3.5
3 Axle Vehicles	3	2	1		6	0	6	8		14	0	0	0	0	0	0	12	3		17	0	0	37
% 3 Axle Vehicles	0.2	2.6	0.2		0.3	0	1.6	2		1.8	0	0	0	0	0	0	4.7	3.2		7.4	0	0	1.1
4+ Axle Trucks	18	0	6		25	0	6	23		29	0	0	0	0	0	0	5	7		15	0	0	69
% 4+ Axle Trucks	1.2	0	1.1		1.1	0	1.6	5.6		3.6	0	0	0	0	0	0	2	7.4		11.1	0	0	2

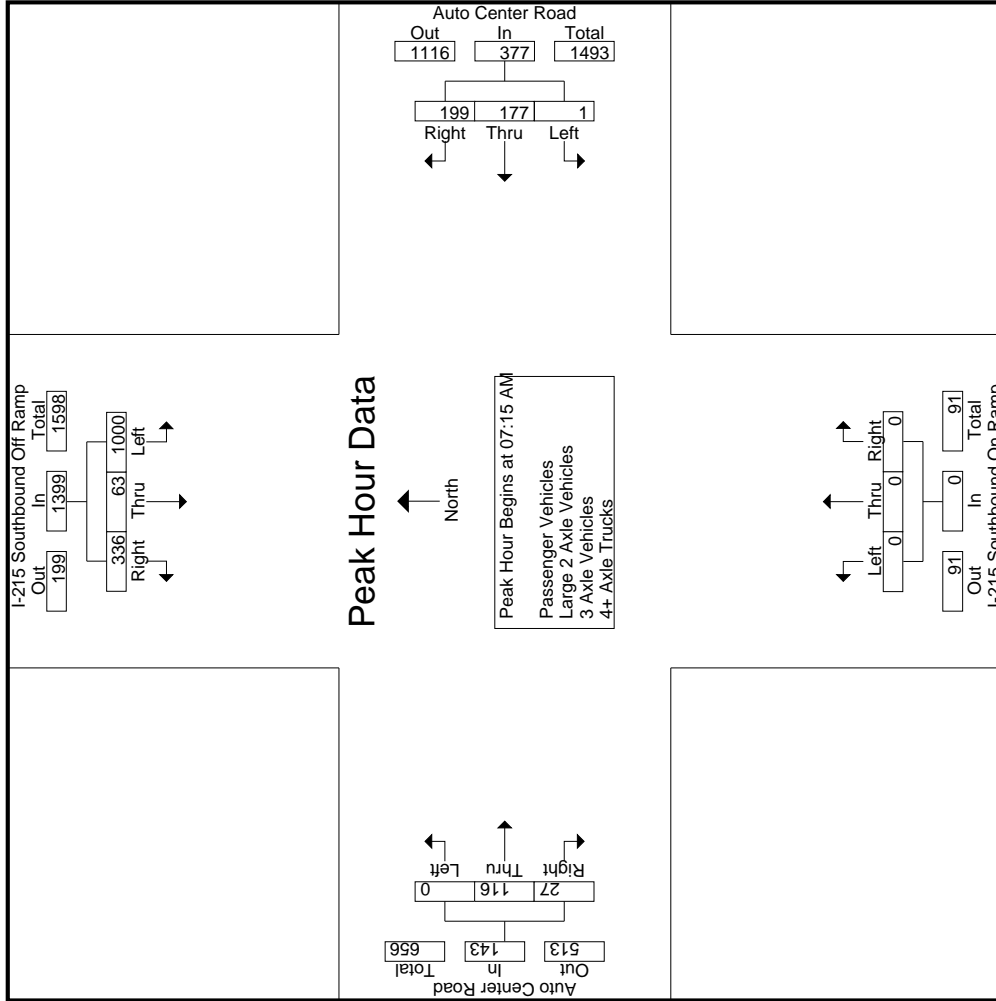
Start Time	I-215 Southbound Off Ramp Southbound					Auto Center Road Westbound					I-215 Southbound On Ramp Northbound					Auto Center Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:15 AM	267	11	75		353	0	34	40		74	0	0	0	0	0	0	28	4		32	4	32	459
07:30 AM	218	27	78		323	0	43	62		105	0	0	0	0	0	0	24	6		30	6	30	458
07:45 AM	269	12	100		381	1	47	42		90	0	0	0	0	0	0	35	6		41	6	41	512
08:00 AM	246	13	83		342	0	53	55		108	0	0	0	0	0	0	29	11		40	11	40	490
Total Volume	1000	63	336		1399	1	177	199		377	0	0	0	0	0	0	116	27		143	27	143	1919
% App. Total	71.5	4.5	24			0.3	46.9	52.8			0	0	0	0	0	0	81.1	18.9			18.9		
PHF	.929	.583	.840		.918	.250	.835	.802		.873	.000	.000	.000	.000	.000	.000	.829	.614		.872			.937

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:15 AM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Road
 Weather: Clear

File Name : 01-SBC215SAUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Road
 Weather: Clear

File Name : 01-SBC215SAUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	I-215 Southbound Off Ramp Southbound			Auto Center Road Westbound			I-215 Southbound On Ramp Northbound			Auto Center Road Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	07:15 AM			08:00 AM			07:00 AM			08:00 AM				
+0 mins.	267	11	75	0	53	55	108	0	0	0	0	29	11	40
+15 mins.	218	27	78	0	58	52	110	0	0	0	0	26	22	48
+30 mins.	269	12	100	1	43	52	96	0	0	0	0	42	19	61
+45 mins.	246	13	83	0	67	58	125	0	0	0	0	45	13	58
Total Volume	1000	63	336	1	221	217	439	0	0	0	0	142	65	207
% App. Total	71.5	4.5	24	0.2	50.3	49.4		0	0	0	0	68.6	31.4	
PHF	.929	.583	.840	.250	.825	.935	.878	.000	.000	.000	.000	.789	.739	.848

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Road
 Weather: Clear

File Name : 01-SBC215SAUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles

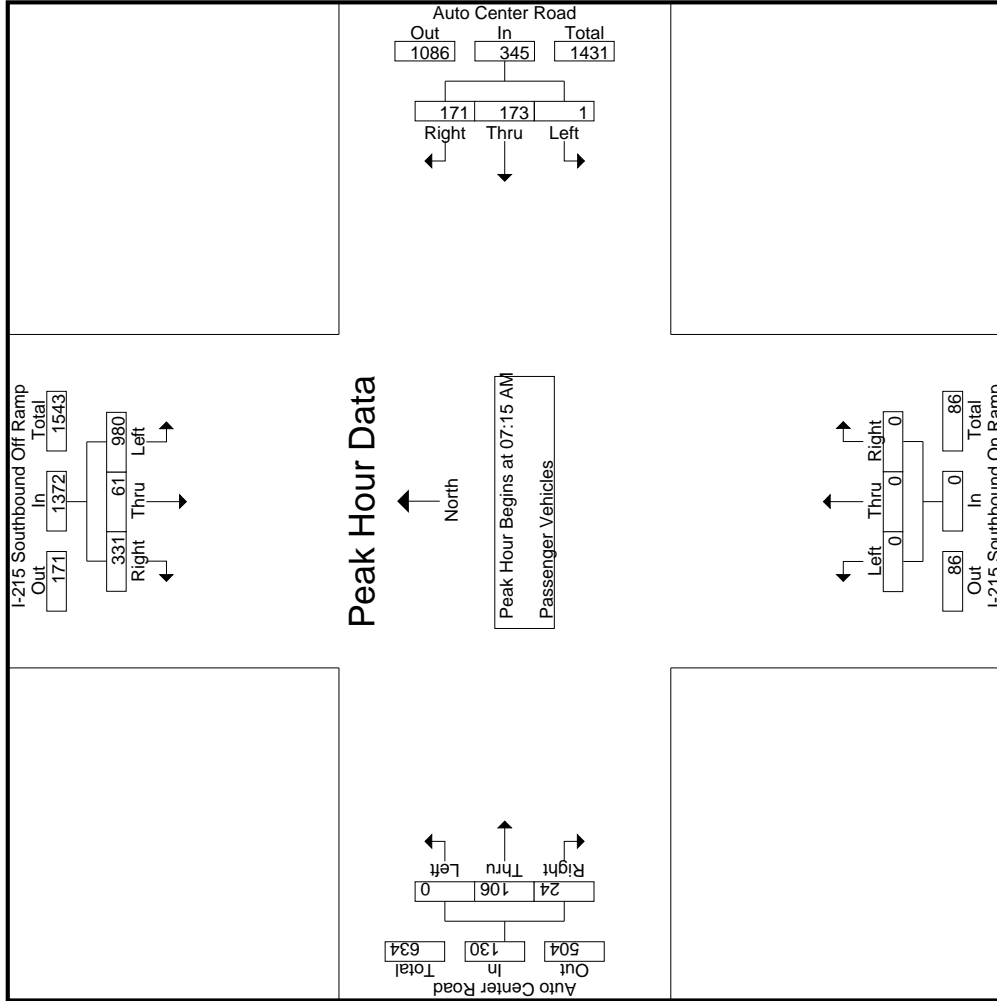
Start Time	I-215 Southbound Off Ramp Southbound					Auto Center Road Westbound					I-215 Southbound On Ramp Northbound					Auto Center Road Eastbound					Int. Total		
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total		Exclu. Total	Inclu. Total
07:00 AM	142	9	45	15	196	0	34	40	0	74	0	0	0	0	0	0	24	13	6	37	21	307	328
07:15 AM	262	11	73	13	346	0	31	35	0	66	0	0	0	0	0	0	22	2	0	24	13	436	449
07:30 AM	214	27	78	20	319	0	43	56	0	99	0	0	0	0	0	0	23	5	2	28	22	446	468
07:45 AM	264	11	100	32	375	1	46	33	0	80	0	0	0	0	0	34	6	1	40	33	495	528	
Total	882	58	296	80	1236	1	154	164	0	319	0	0	0	0	0	103	26	9	129	89	1684	1773	
08:00 AM	240	12	80	34	332	0	53	47	0	100	0	0	0	0	0	0	27	11	3	38	37	470	507
08:15 AM	122	3	50	17	175	0	55	46	0	101	0	0	0	0	0	0	24	19	2	43	19	319	338
08:30 AM	109	0	48	12	157	1	40	47	0	88	0	0	0	0	0	39	16	6	55	18	300	318	
08:45 AM	115	2	45	12	162	0	62	49	0	111	0	0	0	0	0	39	12	2	51	14	324	338	
Total	586	17	223	75	826	1	210	189	0	400	0	0	0	0	0	129	58	13	187	88	1413	1501	
Grand Total	1468	75	519	155	2062	2	364	353	0	719	0	0	0	0	0	232	84	22	316	177	3097	3274	
Approach %	71.2	3.6	25.2		66.6	0.3	50.6	49.1		23.2	0	0	0	0	0	73.4	26.6		10.2	5.4	94.6		
Total %	47.4	2.4	16.8			0.1	11.8	11.4			0	0	0	0	0	7.5	2.7						

Start Time	I-215 Southbound Off Ramp Southbound					Auto Center Road Westbound					I-215 Southbound On Ramp Northbound					Auto Center Road Eastbound					Int. Total		
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total		Exclu. Total	Inclu. Total
07:15 AM	262	11	73	13	346	0	31	35	0	66	0	0	0	0	0	0	22	2	0	24	2	24	436
07:30 AM	214	27	78	20	319	0	43	56	0	99	0	0	0	0	0	0	23	5	2	28	22	446	
07:45 AM	264	11	100	32	375	1	46	33	0	80	0	0	0	0	0	34	6	1	40	33	495		
08:00 AM	240	12	80	34	332	0	53	47	0	100	0	0	0	0	0	0	27	11	3	38	37	470	
Total Volume	980	61	331	1372	1372	1	173	171	0	345	0	0	0	0	0	106	24	130	1847	1847			
% App. Total	71.4	4.4	24.1		66.6	0.3	50.1	49.6		23.2	0	0	0	0	0	81.5	18.5		10.2	5.4	94.6		
PHF	.928	.565	.828		.915	.250	.816	.763		.863	.000	.000	.000	.000	.000	.000	.779	.545		.813		.933	

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Road
 Weather: Clear

File Name : 01-SBC215SAUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Road
 Weather: Clear

File Name : 01-SBC215SAUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	I-215 Southbound Off Ramp			Auto Center Road Westbound			I-215 Southbound On Ramp			Auto Center Road Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1	Peak Hour for Each Approach Begins at:													
	07:15 AM													
+0 mins.	262	11	73	0	31	35	66	0	0	0	0	22	2	24
+15 mins.	214	27	78	0	43	56	99	0	0	0	0	23	5	28
+30 mins.	264	11	100	1	46	33	80	0	0	0	0	34	6	40
+45 mins.	240	12	80	0	53	47	100	0	0	0	0	27	11	38
Total Volume	980	61	331	1	173	171	345	0	0	0	0	106	24	130
% App. Total	71.4	4.4	24.1	0.3	50.1	49.6	86.3	0	0	0	0	81.5	18.5	130
PHF	.928	.565	.828	.250	.816	.763	.863	.000	.000	.000	.000	.779	.545	.813

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Road
 Weather: Clear

File Name : 01-SBC215SAUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Large 2 Axle Vehicles

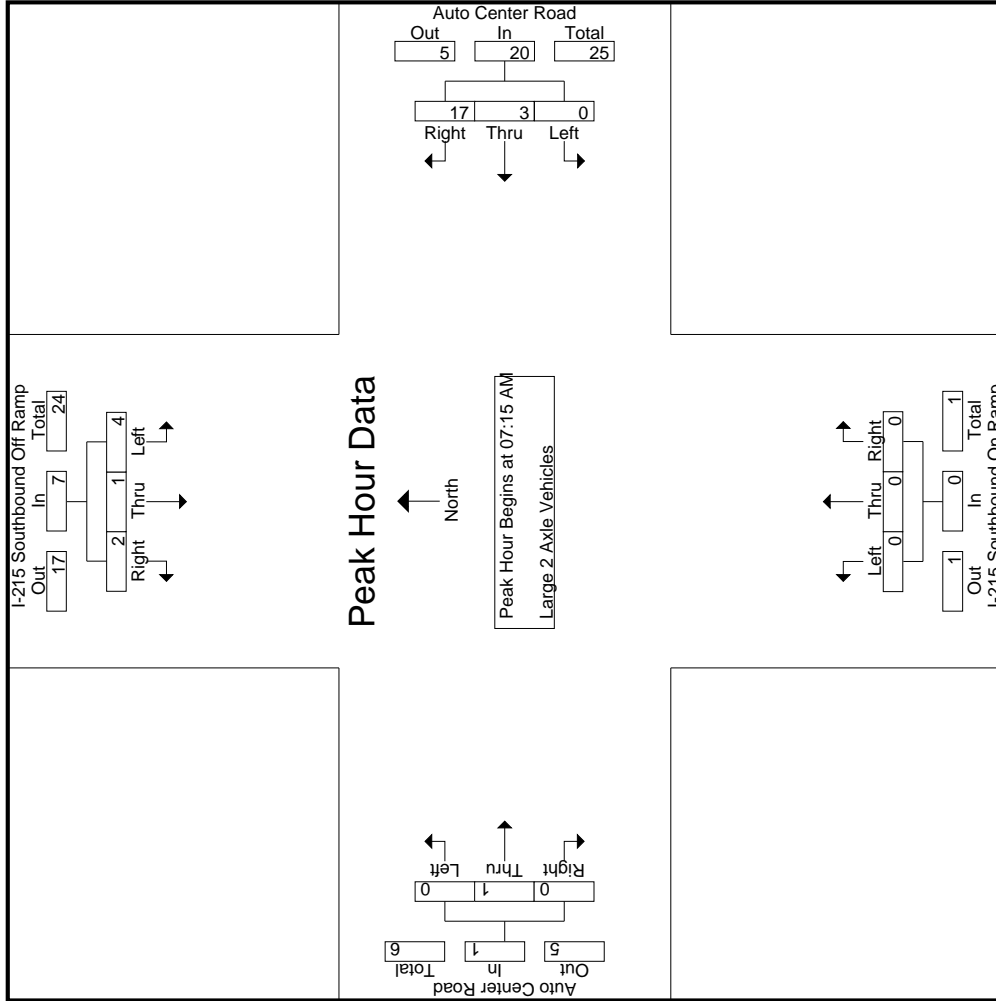
Start Time	I-215 Southbound Off Ramp Southbound				Auto Center Road Westbound				I-215 Southbound On Ramp Northbound				Auto Center Road Eastbound				Exclu. Total	Inclu. Total	Int. Total				
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left				Thru	Right	RTOR	App. Total
07:00 AM	1	0	0	0	1	0	1	4	0	5	0	0	0	0	0	0	0	0	0	0	0	0	6
07:15 AM	2	0	1	0	3	0	2	2	0	4	0	0	0	0	0	0	0	0	0	0	0	0	7
07:30 AM	0	0	0	0	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
07:45 AM	0	1	0	0	1	0	1	6	0	7	0	0	0	0	0	0	0	0	0	0	0	0	4
Total	3	1	1	0	5	0	4	16	0	20	0	0	0	0	0	0	0	0	0	0	0	0	25
08:00 AM	2	0	1	0	3	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	9
08:15 AM	1	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3
08:30 AM	18	0	0	0	18	0	3	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	24
08:45 AM	42	0	9	4	51	0	2	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	57
Total	63	0	10	4	73	0	5	8	0	13	0	0	0	0	0	0	0	0	0	0	0	0	93
Grand Total	66	1	11	4	78	0	9	24	0	33	0	0	0	0	0	0	6	1	0	7	4	4	118
Approch %	84.6	1.3	14.1		66.1	0	27.3	72.7		28	0	0	0	0	0	0	85.7	14.3		5.9	3.3	96.7	
Total %	55.9	0.8	9.3			0	7.6	20.3			0	0	0	0	0	0	5.1	0.8					

Start Time	I-215 Southbound Off Ramp Southbound				Auto Center Road Westbound				I-215 Southbound On Ramp Northbound				Auto Center Road Eastbound				Exclu. Total	Inclu. Total	Int. Total				
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left				Thru	Right	RTOR	App. Total
07:15 AM	2	0	0	0	1	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	2	0	1	0	3	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	4	1	1	2	7	0	0	3	17	20	0	0	0	0	0	0	0	0	0	0	0	0	1
% App. Total	57.1	14.3	28.6		28.6	0	0	15	85		0	0	0	0	0	0	100	0	0	0	0	0	28
PHF	.500	.250	.500		.583	.000	.375	.708	.714	.000	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.000	.000	.778

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Road
 Weather: Clear

File Name : 01-SBC215SAUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Road
 Weather: Clear

File Name : 01-SBC215SAUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	I-215 Southbound Off Ramp			Auto Center Road Westbound			I-215 Southbound On Ramp			Auto Center Road Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1	Peak Hour for Each Approach Begins at:													
	07:15 AM													
+0 mins.	2	0	1	3	0	2	4	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	4	4	0	0	0	0	0	0	0
+30 mins.	0	1	0	1	0	6	7	0	0	0	0	0	0	0
+45 mins.	2	0	1	3	0	5	5	0	0	0	1	0	0	1
Total Volume	4	1	2	7	0	17	20	0	0	0	1	0	0	1
% App. Total	57.1	14.3	28.6	85	0	15	85	0	0	0	100	0	0	0
PHF	.500	.250	.500	.583	.000	.375	.714	.000	.000	.000	.250	.000	.000	.250

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Road
 Weather: Clear

File Name : 01-SBC215SAUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 3 Axle Vehicles

Start Time	I-215 Southbound Off Ramp Southbound					Auto Center Road Westbound					I-215 Southbound On Ramp Northbound					Auto Center Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	4	1	0	5	0	0	0	0	0	0	1	0	0	1	0	6	6
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	5	0	5	5
07:30 AM	1	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	1	0	0	1	0	3	3
07:45 AM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1
Total	1	0	0	0	1	0	4	3	0	7	0	0	0	0	0	7	7	0	0	7	0	15	15
08:00 AM	2	1	1	0	4	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	5	5
08:15 AM	0	0	0	0	0	1	1	1	0	2	0	0	0	0	0	0	0	2	1	2	1	4	5
08:30 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	2	1	3	4
08:45 AM	0	0	0	0	0	1	3	0	0	4	0	0	0	0	0	0	4	0	0	4	0	8	8
Total	2	2	1	0	5	0	2	5	0	7	0	0	0	0	0	5	5	3	2	8	2	20	22
Grand Total	3	2	1	0	6	0	6	8	0	14	0	0	0	0	0	12	3	2	2	15	2	35	37
Approach %	50	33.3	16.7		17.1	0	42.9	57.1		40	0	0	0	0	0	80	20			42.9	5.4	94.6	
Total %	8.6	5.7	2.9			0	17.1	22.9			0	0	0	0	0	34.3	8.6						

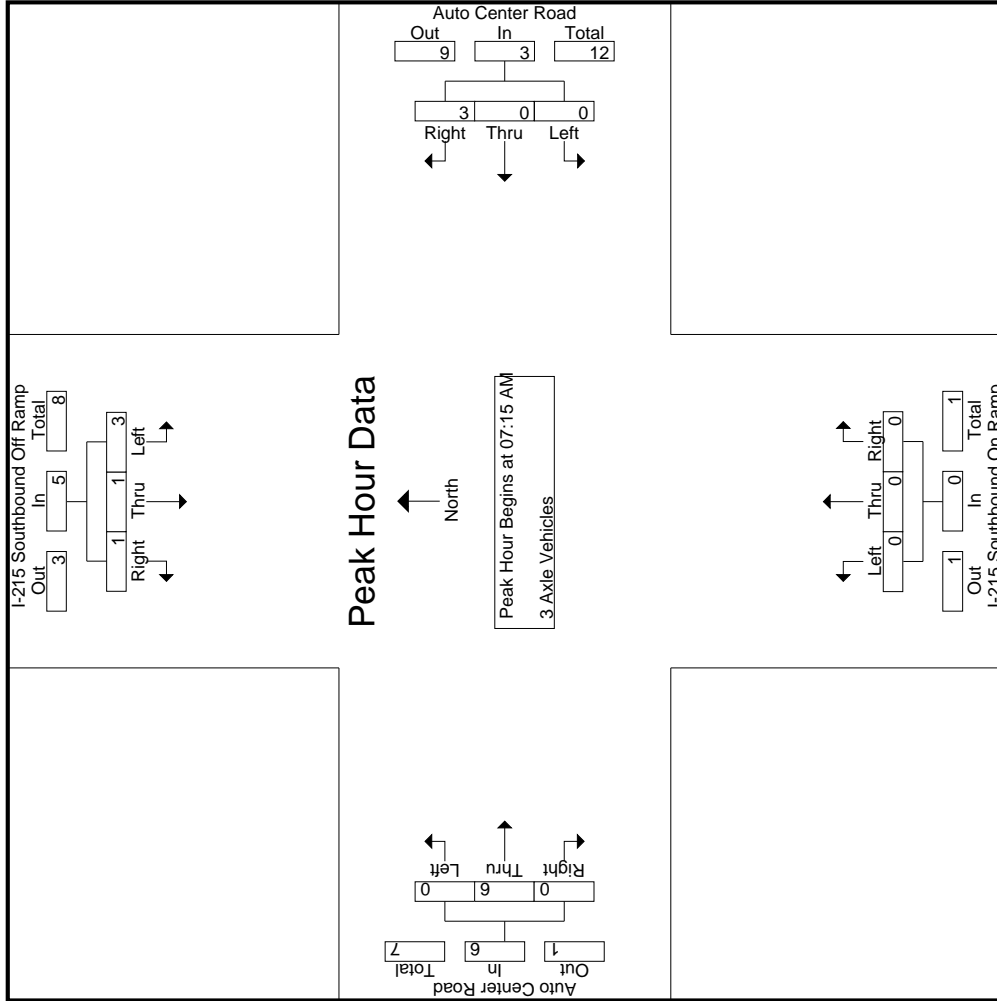
Start Time	I-215 Southbound Off Ramp Southbound					Auto Center Road Westbound					I-215 Southbound On Ramp Northbound					Auto Center Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	1	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	2	1	1	0	4	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	3	1	1	0	5	0	0	3	0	3	0	0	0	0	0	0	6	0	0	6	0	6	14
% App. Total	60	20	20			0	0	100		100	0	0	0	0	0	100	0	0	0	100	0	0	0
PHF	.375	.250	.250		.313	.000	.000	.750		.750	.000	.000	.000	.000	.000	.000	.300	.000	.000	.300	.000	.300	.700

Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:15 AM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Road
 Weather: Clear

File Name : 01-SBC215SAUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Road
 Weather: Clear

File Name : 01-SBC215SAUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	I-215 Southbound Off Ramp Southbound			Auto Center Road Westbound			I-215 Southbound On Ramp Northbound			Auto Center Road Eastbound			App. Total	Int. Total	
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right			
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1	07:15 AM														
Peak Hour for Each Approach Begins at:	07:15 AM														
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1
+15 mins.	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0
+30 mins.	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
+45 mins.	2	1	1	0	0	1	0	0	0	0	0	0	0	0	0
Total Volume	3	1	1	0	0	3	0	0	0	0	0	0	0	6	0
% App. Total	60	20	20	0	0	100	0	0	0	0	0	0	0	100	0
PHF	.375	.250	.250	.000	.000	.750	.000	.000	.000	.000	.000	.000	.000	.300	.000

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Road
 Weather: Clear

File Name : 01-SBC215SAUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 4+ Axle Trucks

Start Time	I-215 Southbound Off Ramp Southbound				Auto Center Road Westbound				I-215 Southbound On Ramp Northbound				Auto Center Road Eastbound					
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	1	0	1	0	2	0	1	2	0	3	0	0	0	0	0	0	7	7
07:15 AM	3	0	1	0	4	0	1	3	0	4	0	0	0	0	3	0	11	11
07:30 AM	3	0	0	0	3	0	0	1	0	1	0	0	0	1	1	1	5	6
07:45 AM	5	0	0	0	5	0	0	2	0	2	0	0	0	0	0	0	8	8
Total	12	0	2	0	14	0	2	8	0	10	0	0	0	4	7	1	31	32
08:00 AM	2	0	1	0	3	0	0	2	0	2	0	0	0	0	1	0	6	6
08:15 AM	2	0	1	0	3	0	2	4	0	6	0	0	1	0	2	0	11	11
08:30 AM	2	0	1	1	3	0	0	4	0	4	0	0	2	2	3	9	12	
08:45 AM	0	0	1	0	1	0	2	5	0	7	0	0	0	0	0	0	8	8
Total	6	0	4	1	10	0	4	15	0	19	0	0	0	2	5	3	34	37
Grand Total	18	0	6	1	24	0	6	23	0	29	0	0	0	3	12	4	65	69
Approach %	75	0	25		36.9	0	20.7	79.3		44.6	0	0	0	58.3	18.5	5.8	94.2	
Total %	27.7	0	9.2			0	9.2	35.4			0	0	0	10.8				

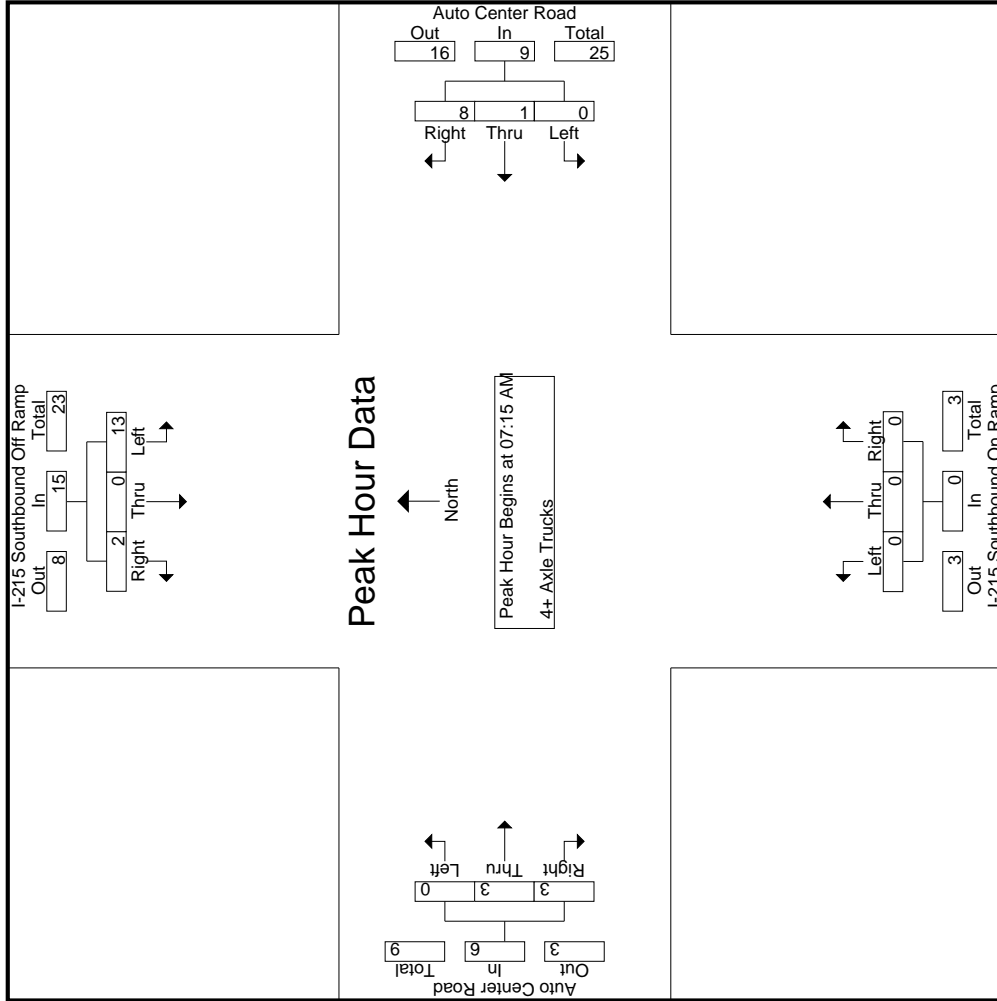
Start Time	I-215 Southbound Off Ramp Southbound				Auto Center Road Westbound				I-215 Southbound On Ramp Northbound				Auto Center Road Eastbound					
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:15 AM	3	0	1		4	0	1	3		3	0	0	0		0	2	3	11
07:30 AM	3	0	0		3	0	0	1		1	0	0	0		0	1	1	5
07:45 AM	5	0	0		5	0	0	2		2	0	0	0		0	0	1	8
08:00 AM	2	0	1		3	0	0	2		2	0	0	0		0	0	1	6
Total Volume	13	0	2		15	0	1	8		9	0	0	0		3	3	6	30
% App. Total	86.7	0	13.3		13.3	0	11.1	88.9		88.9	0	0	0		50	50	30	
PHF	.650	.000	.500		.750	.000	.250	.667		.563	.000	.000	.000		.750	.375	.500	.682

Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:15 AM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Road
 Weather: Clear

File Name : 01-SBC215SAUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Road
 Weather: Clear

File Name : 01-SBC215SAUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	I-215 Southbound Off Ramp Southbound			Auto Center Road Westbound			I-215 Southbound On Ramp Northbound			Auto Center Road Eastbound			App. Total	Int. Total	
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right			
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1	Peak Hour for Each Approach Begins at:														
	07:15 AM														
+0 mins.	3	0	1	0	0	3	4	0	0	0	0	0	1	2	3
+15 mins.	3	0	0	0	0	1	1	0	0	0	0	0	0	1	1
+30 mins.	5	0	0	0	0	2	2	0	0	0	0	0	1	0	1
+45 mins.	2	0	1	0	0	2	2	0	0	0	0	0	1	0	1
Total Volume	13	0	2	0	1	8	9	0	0	0	0	0	3	3	6
% App. Total	86.7	0	13.3	0	11.1	88.9	56.3	0	0	0	0	0	50	50	50
PHF	.650	.000	.500	.750	.000	.250	.667	.000	.000	.000	.000	.000	.750	.375	.500

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Road
 Weather: Clear

File Name : 01-SBC215SAUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	I-215 Southbound Off Ramp Southbound					Auto Center Road Westbound					I-215 Southbound On Ramp Northbound					Auto Center Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	138	14	62	25	214	5	58	141	1	204	0	0	0	0	0	0	78	22	6	100	32	518	550
04:15 PM	158	11	65	21	234	6	54	121	0	181	0	0	0	0	0	0	67	24	8	91	29	506	535
04:30 PM	127	14	68	32	209	3	81	145	0	229	0	0	0	0	0	0	95	34	14	129	46	567	613
04:45 PM	132	30	66	33	228	4	76	128	0	208	0	0	0	0	0	0	89	39	15	128	48	564	612
Total	555	69	261	111	885	18	269	535	1	822	0	0	0	0	0	0	329	119	43	448	155	2155	2310
05:00 PM	91	19	48	21	158	1	75	162	0	238	0	0	0	0	0	0	133	40	7	173	28	569	597
05:15 PM	156	36	65	30	257	0	65	131	1	196	0	0	0	0	0	0	104	42	13	146	44	599	643
05:30 PM	137	20	36	17	193	1	61	119	0	181	0	0	0	0	0	0	82	24	11	106	28	480	508
05:45 PM	152	9	42	14	203	3	59	120	0	182	0	0	0	0	0	0	65	26	9	91	23	476	499
Total	536	84	191	82	811	5	260	532	1	797	0	0	0	0	0	0	384	132	40	516	123	2124	2247
Grand Total	1091	153	452	193	1696	23	529	1067	2	1619	0	0	0	0	0	0	713	251	83	964	278	4279	4557
Approach %	64.3	9	26.7			1.4	32.7	65.9			0	0	0	0	0	0	74	26					
Total %	25.5	3.6	10.6		39.6	0.5	12.4	24.9		37.8	0	0	0	0	0	0	16.7	5.9		22.5	6.1	93.9	
Passenger Vehicles	977	149	428		1738	23	514	1024		1563	0	0	0	0	0	0	701	236		1017	0	0	4318
% Passenger Vehicles	89.6	97.4	94.7	95.3	92	100	97.2	96	100	96.4	0	0	0	0	0	0	98.3	94	96.4	97.1	0	0	94.8
Large 2 Axle Vehicles	87	1	4		93	0	4	13		17	0	0	0	0	0	0	4	2		6	0	0	116
% Large 2 Axle Vehicles	8	0.7	0.9	0.5	4.9	0	0.8	1.2	0	1	0	0	0	0	0	0	0.6	0.8	0	0.6	0	0	2.5
3 Axle Vehicles	14	1	18		41	0	5	5		10	0	0	0	0	0	0	4	4		8	0	0	59
% 3 Axle Vehicles	1.3	0.7	4	4.1	2.2	0	0.9	0.5	0	0.6	0	0	0	0	0	0	0.6	1.6	0	0.8	0	0	1.3
4+ Axle Trucks	13	2	2		17	0	6	25		31	0	0	0	0	0	0	4	9		16	0	0	64
% 4+ Axle Trucks	1.2	1.3	0.4	0	0.9	0	1.1	2.3	0	1.9	0	0	0	0	0	0	0.6	3.6	3.6	1.5	0	0	1.4

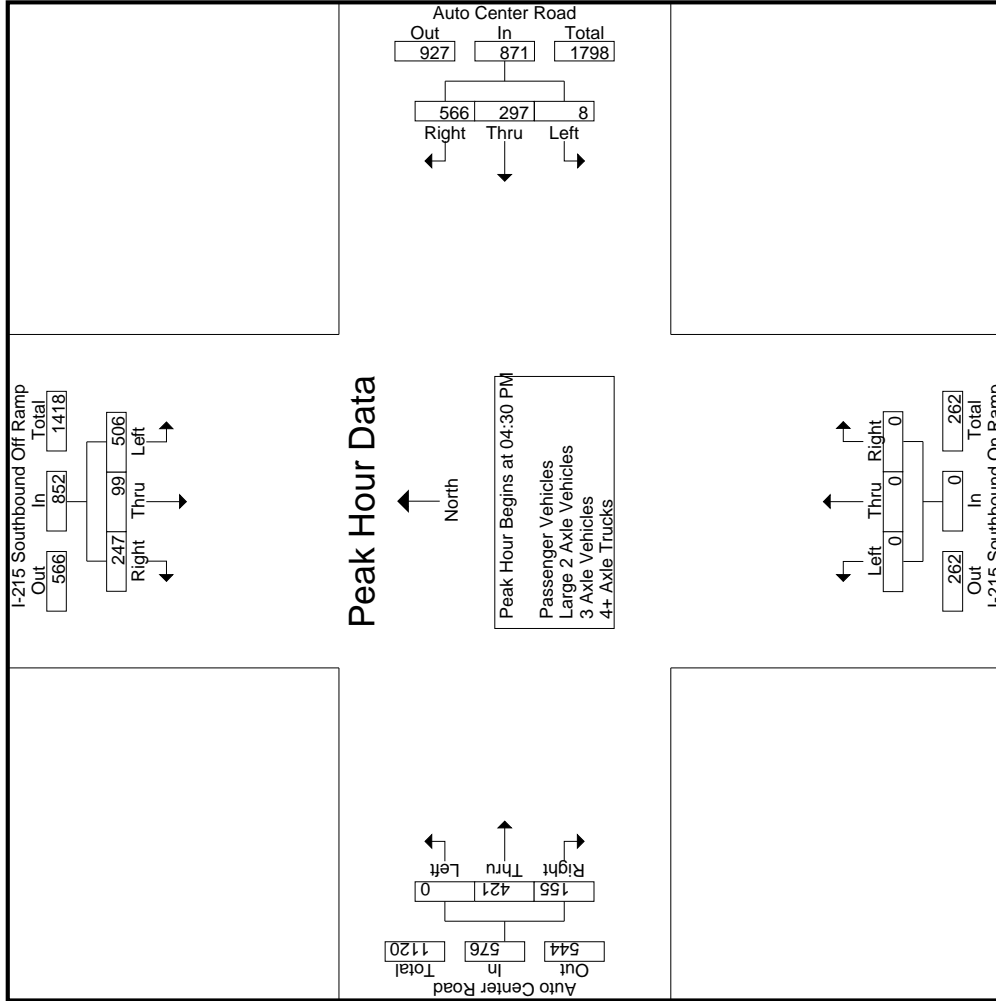
Start Time	I-215 Southbound Off Ramp Southbound					Auto Center Road Westbound					I-215 Southbound On Ramp Northbound					Auto Center Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:30 PM	127	14	68		209	3	81	145		229	0	0	0	0	0	0	95	34		129			567
04:45 PM	132	30	66		228	4	76	128		208	0	0	0	0	0	0	89	39		128			564
05:00 PM	91	19	48		158	1	75	162		238	0	0	0	0	0	0	133	40		173			569
05:15 PM	156	36	65		257	0	65	131		196	0	0	0	0	0	0	104	42		146			643
Total Volume	506	99	247		852	8	297	566		871	0	0	0	0	0	0	421	155		576			2299
% App. Total	59.4	11.6	29		29	0.9	34.1	65		65	0	0	0	0	0	0	73.1	26.9		26.9			960
PHF	.811	.688	.908		.829	.500	.917	.873		.915	.000	.000	.000	.000	.000	.000	.791	.923		.832			

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:30 PM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Road
 Weather: Clear

File Name : 01-SBC215SAUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
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 (951) 268-6268

City of San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Road
 Weather: Clear

File Name : 01-SBC215SAUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	I-215 Southbound Off Ramp Southbound				Auto Center Road Westbound				I-215 Southbound On Ramp Northbound				Auto Center Road Eastbound			
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																
Peak Hour for Each Approach Begins at:																
	04:00 PM				04:30 PM				04:00 PM				04:30 PM			
+0 mins.	138	14	62	214	3	81	145	229	0	0	0	0	0	95	34	129
+15 mins.	158	11	65	234	4	76	128	208	0	0	0	0	0	89	39	128
+30 mins.	127	14	68	209	1	75	162	238	0	0	0	0	0	133	40	173
+45 mins.	132	30	66	228	0	65	131	196	0	0	0	0	0	104	42	146
Total Volume	555	69	261	885	8	297	566	871	0	0	0	0	0	421	155	576
% App. Total	62.7	7.8	29.5	946	0.9	34.1	65	915	0	0	0	0	0	73.1	26.9	832
PHF	.878	.575	.960	.946	.500	.917	.873	.915	.000	.000	.000	.000	.000	.791	.923	.832

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City of San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Road
 Weather: Clear

File Name : 01-SBC215SAUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles

Start Time	I-215 Southbound Off Ramp Southbound					Auto Center Road Westbound					I-215 Southbound On Ramp Northbound					Auto Center Road Eastbound					Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total			
04:00 PM	110	13	58	23	181	5	57	134	1	196	0	0	0	0	0	0	77	20	6	97	30	474	504
04:15 PM	120	9	64	21	193	6	52	115	0	173	0	0	0	0	0	0	66	24	8	90	29	456	485
04:30 PM	111	14	65	31	190	3	78	141	0	222	0	0	0	0	0	0	95	31	13	126	44	538	582
04:45 PM	122	30	64	33	216	4	75	119	0	198	0	0	0	0	0	0	88	38	15	126	48	540	588
Total	463	66	251	108	780	18	262	509	1	789	0	0	0	0	0	0	326	113	42	439	151	2008	2159
05:00 PM	87	19	43	19	149	1	73	158	0	232	0	0	0	0	0	0	131	38	6	169	25	550	575
05:15 PM	153	35	61	29	249	0	64	127	1	191	0	0	0	0	0	0	100	37	13	137	43	577	620
05:30 PM	131	20	33	14	184	1	59	118	0	178	0	0	0	0	0	0	81	23	10	104	24	466	490
05:45 PM	143	9	40	14	192	3	56	112	0	171	0	0	0	0	0	0	63	25	9	88	23	451	474
Total	514	83	177	76	774	5	252	515	1	772	0	0	0	0	0	0	375	123	38	498	115	2044	2159
Grand Total	977	149	428	184	1554	23	514	1024	2	1561	0	0	0	0	0	0	701	236	80	937	266	4052	4318
Approach %	62.9	9.6	27.5		38.4	1.5	32.9	65.6		38.5	0	0	0	0	0	0	74.8	25.2		23.1	6.2	93.8	
Total %	24.1	3.7	10.6			0.6	12.7	25.3			0	0	0	0	0	0	17.3	5.8					

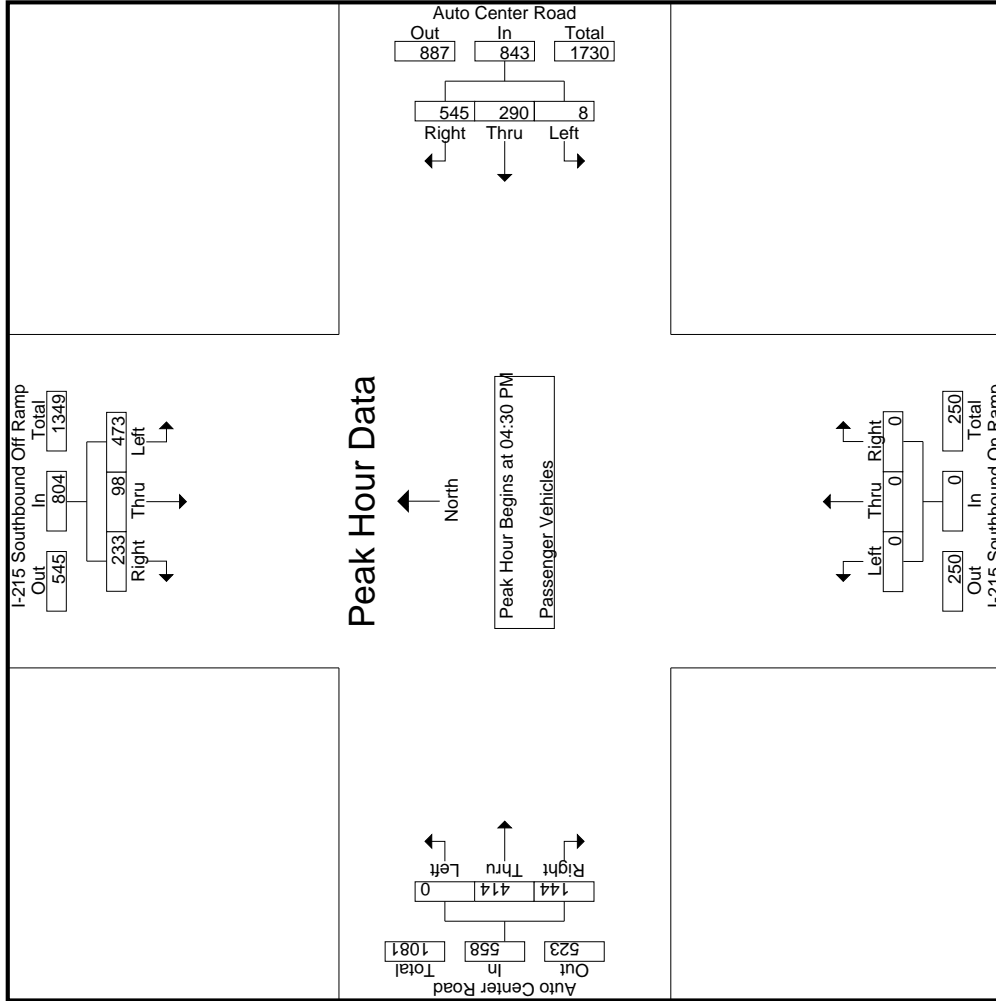
Start Time	I-215 Southbound Off Ramp Southbound					Auto Center Road Westbound					I-215 Southbound On Ramp Northbound					Auto Center Road Eastbound					Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total			
04:30 PM	111	14	65		190	3	78	141		222	0	0	0		0	0	95	31		126	31	126	538
04:45 PM	122	30	64		216	4	75	119		198	0	0	0		0	0	88	38		126	38	126	540
05:00 PM	87	19	43		149	1	73	158		232	0	0	0		0	0	131	38		169	38	169	550
05:15 PM	153	35	61		249	0	64	127		191	0	0	0		0	0	100	37		137	43	137	577
Total Volume	473	98	233		804	8	290	545		843	0	0	0		0	0	414	144		558	144	558	2205
% App. Total	58.8	12.2	29		38.4	0.9	34.4	64.7		38.5	0	0	0		0	0	74.2	25.8		23.1	6.2	93.8	
PHF	.773	.700	.896		.807	.500	.929	.862		.908	.000	.000	.000		.000	.000	.790	.947		.825	.825	.955	

Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:30 PM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Road
 Weather: Clear

File Name : 01-SBC215SAUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



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City of San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Road
 Weather: Clear

File Name : 01-SBC215SAUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	I-215 Southbound Off Ramp Southbound				Auto Center Road Westbound				I-215 Southbound On Ramp Northbound				Auto Center Road Eastbound			
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																
Peak Hour for Each Approach Begins at:																
	04:30 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	111	14	65	190	3	78	141	222	0	0	0	0	0	95	31	126
+15 mins.	122	30	64	216	4	75	119	198	0	0	0	0	0	88	38	126
+30 mins.	87	19	43	149	1	73	158	232	0	0	0	0	0	131	38	169
+45 mins.	153	35	61	249	0	64	127	191	0	0	0	0	0	100	37	137
Total Volume	473	98	233	804	8	290	545	843	0	0	0	0	0	414	144	558
% App. Total	58.8	12.2	29		0.9	34.4	64.7		0	0	0	0	0	74.2	25.8	
PHF	.773	.700	.896	.807	.500	.929	.862	.908	.000	.000	.000	.000	.000	.790	.947	.825

Counts Unlimited
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City of San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Road
 Weather: Clear

File Name : 01-SBC215SAUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Large 2 Axle Vehicles

Start Time	I-215 Southbound Off Ramp Southbound				Auto Center Road Westbound				I-215 Southbound On Ramp Northbound				Auto Center Road Eastbound				Exclu. Total	Inclu. Total	Int. Total			
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left				Thru	Right	RTOR
04:00 PM	26	0	0	0	26	0	0	2	0	2	0	0	0	0	0	0	0	1	0	0	29	29
04:15 PM	31	1	1	0	33	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	34	34
04:30 PM	13	0	0	0	13	0	1	2	0	3	0	0	0	0	0	0	0	0	0	0	16	16
04:45 PM	7	0	0	0	7	0	0	3	0	3	0	0	0	0	0	0	0	2	0	0	12	12
Total	77	1	1	0	79	0	1	8	0	9	0	0	0	0	0	0	1	2	0	3	91	91
05:00 PM	4	0	2	0	6	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	7	7
05:15 PM	1	0	1	1	2	0	1	2	0	3	0	0	0	0	0	0	1	0	0	1	6	7
05:30 PM	2	0	0	0	2	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	4	4
05:45 PM	3	0	0	0	3	0	1	2	0	3	0	0	0	0	0	0	1	0	0	1	7	7
Total	10	0	3	1	13	0	3	5	0	8	0	0	0	0	0	0	3	0	0	3	24	25
Grand Total	87	1	4	1	92	0	4	13	0	17	0	0	0	0	0	4	2	0	6	1	115	116
Approach %	94.6	1.1	4.3			0	23.5	76.5		14.8	0	0	0	0	66.7	33.3			5.2	0.9	99.1	
Total %	75.7	0.9	3.5			0	3.5	11.3			0	0	0	0	3.5	1.7						

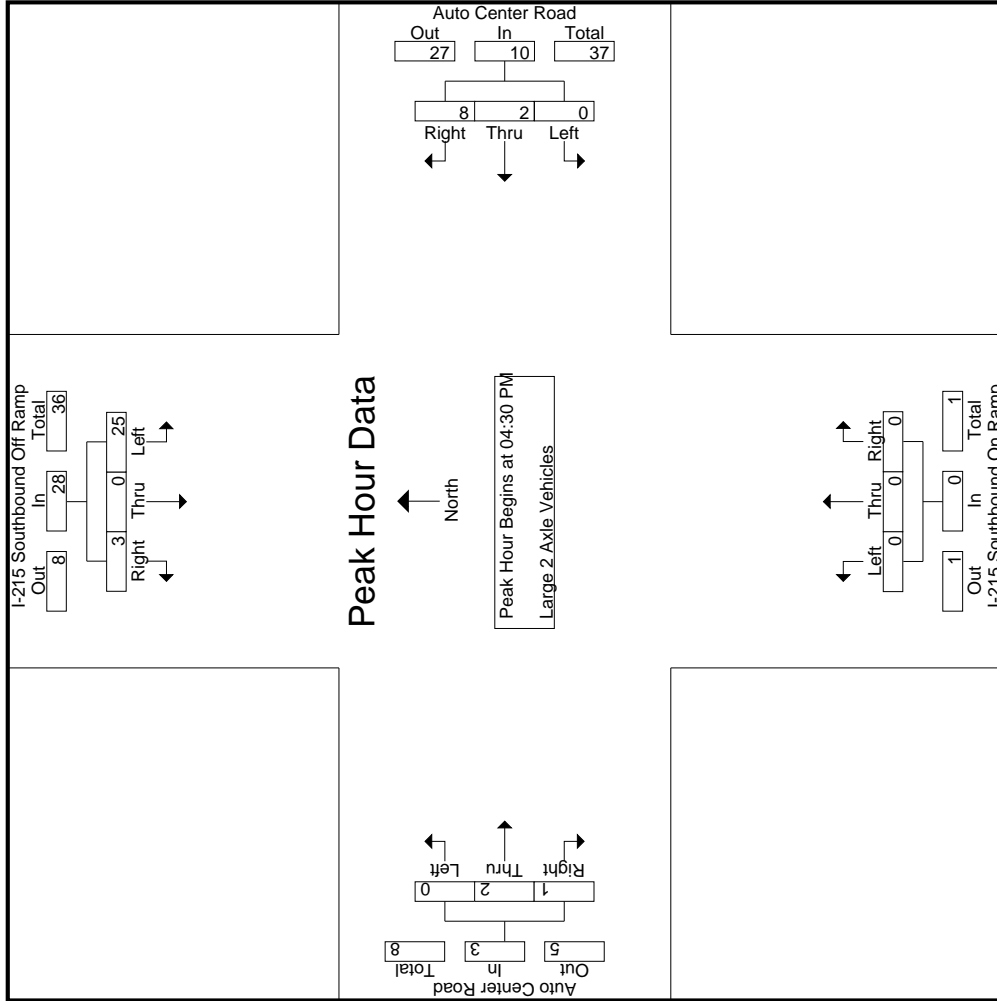
Start Time	I-215 Southbound Off Ramp Southbound				Auto Center Road Westbound				I-215 Southbound On Ramp Northbound				Auto Center Road Eastbound				Exclu. Total	Inclu. Total	Int. Total			
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left				Thru	Right	RTOR
04:30 PM	13	0	0	0	13	0	1	2	0	2	0	0	0	0	0	0	0	0	0	0	0	16
04:45 PM	7	0	0	0	7	0	0	3	0	3	0	0	0	0	0	0	1	1	0	2	12	
05:00 PM	4	0	2	0	6	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	7	
05:15 PM	1	0	1	0	2	0	0	2	0	2	0	0	0	0	0	0	1	0	0	1	6	
Total Volume	25	0	3	0	28	0	2	8	0	10	0	0	0	0	66.7	33.3	2	1	0	3	41	
% App. Total	89.3	0	10.7			0	20	80			0	0	0	0	33.3							
PHF	.481	.000	.375		.538	.000	.500	.667		.833	.000	.000	.000	.000	.500	.250	.375				.641	

Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:30 PM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Road
 Weather: Clear

File Name : 01-SBC215SAUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Road
 Weather: Clear

File Name : 01-SBC215SAUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	I-215 Southbound Off Ramp Southbound			Auto Center Road Westbound			I-215 Southbound On Ramp Northbound			Auto Center Road Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1	Peak Hour for Each Approach Begins at:													
	04:30 PM													
+0 mins.	13	0	0	1	2	3	0	0	0	0	0	0	0	0
+15 mins.	7	0	0	0	3	3	0	0	0	0	1	1	2	0
+30 mins.	4	0	2	0	1	1	0	0	0	0	0	0	0	0
+45 mins.	1	0	1	1	2	3	0	0	0	0	1	0	1	1
Total Volume	25	0	3	2	8	10	0	0	0	0	2	1	3	3
% App. Total	89.3	0	10.7	20	80	100	0	0	0	0	66.7	33.3	100	100
PHF	.481	.000	.375	.538	.667	.833	.000	.000	.000	.000	.500	.250	.375	.375

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Road
 Weather: Clear

File Name : 01-SBC215SAUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 3 Axle Vehicles

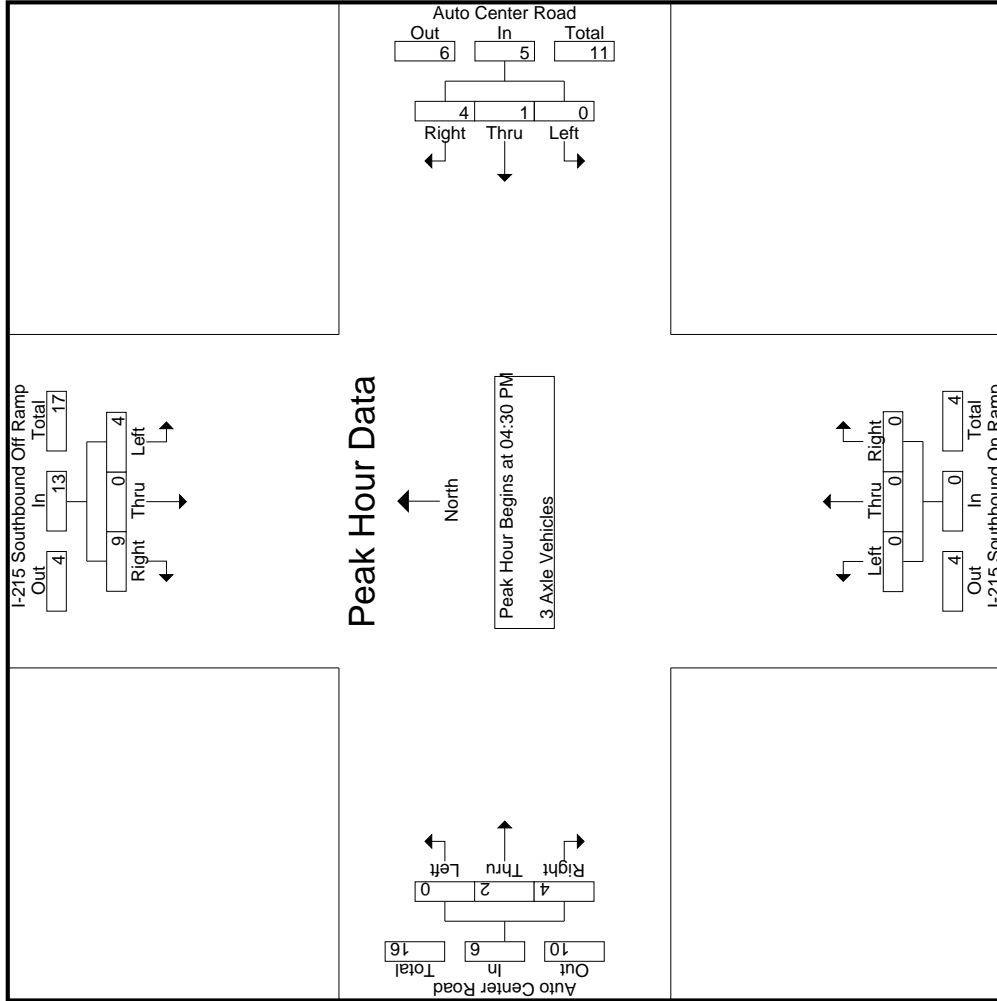
Start Time	I-215 Southbound Off Ramp Southbound					Auto Center Road Westbound					I-215 Southbound On Ramp Northbound					Auto Center Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	1	4	2	5	0	1	1	0	2	0	0	0	0	0	0	0	1	0	1	2	8	10
04:15 PM	4	0	0	0	4	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	5
04:30 PM	2	0	3	1	5	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	6	7
04:45 PM	2	0	1	0	3	0	1	2	0	3	0	0	0	0	0	0	0	0	0	0	0	6	6
Total	8	1	8	3	17	0	3	4	0	7	0	0	0	0	0	0	1	0	0	1	3	25	28
05:00 PM	0	0	3	2	3	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2	4	6
05:15 PM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	2	4	0	6	0	8	8
05:30 PM	2	0	3	3	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	5	8
05:45 PM	4	0	2	0	6	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	9	9
Total	6	0	10	5	16	0	2	1	0	3	0	0	0	0	0	0	3	4	0	7	5	26	31
Grand Total	14	1	18	8	33	0	5	5	0	10	0	0	0	0	0	0	4	4	0	8	8	51	59
Approach %	42.4	3	54.5			0	50	50		19.6	0	0	0			0	50	50		15.7	13.6	86.4	
Total %	27.5	2	35.3		64.7	0	9.8	9.8			0	0	0			0	7.8	7.8					

Start Time	I-215 Southbound Off Ramp Southbound					Auto Center Road Westbound					I-215 Southbound On Ramp Northbound					Auto Center Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:30 PM	2	0	3		5	0	0	1		1	0	0	0		0	0	0	0		0	0	0	0
04:45 PM	2	0	1		3	0	1	2		3	0	0	0		0	0	0	0		0	0	0	0
05:00 PM	0	0	3		3	0	0	1		1	0	0	0		0	0	0	0		0	0	0	0
05:15 PM	0	0	2		2	0	0	0		0	0	0	0		0	0	0	0		0	0	4	8
Total	4	0	9		13	0	1	4		5	0	0	0		0	0	2	4		4	0	6	24
% App. Total	30.8	0	69.2		650	0	20	80		80	0	0	0		0	0	33.3	66.7		33.3	66.7	250	750
PHF	.500	.000	.750		.650	.000	.250	.500		.500	.000	.000	.000		.000	.000	.250	.250		.250	.250	.250	.750

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Road
 Weather: Clear

File Name : 01-SBC215SAUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Road
 Weather: Clear

File Name : 01-SBC215SAUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	I-215 Southbound Off Ramp Southbound			Auto Center Road Westbound			I-215 Southbound On Ramp Northbound			Auto Center Road Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	04:30 PM			04:30 PM			04:30 PM			04:30 PM				
+0 mins.	2	0	3	0	0	1	1	0	0	0	0	0	0	0
+15 mins.	2	0	1	0	1	2	3	0	0	0	0	0	0	0
+30 mins.	0	0	3	0	0	1	1	0	0	0	0	0	0	0
+45 mins.	0	0	2	0	0	0	0	0	0	0	0	2	4	6
Total Volume	4	0	9	0	1	4	5	0	0	0	0	2	4	6
% App. Total	30.8	0	69.2	0	20	80		0	0	0	0	33.3	66.7	
PHF	.500	.000	.750	.650	.250	.500	.417	.000	.000	.000	.000	.250	.250	.250

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Road
 Weather: Clear

File Name : 01-SBC215SAUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 4+ Axle Trucks

Start Time	I-215 Southbound Off Ramp Southbound					Auto Center Road Westbound					I-215 Southbound On Ramp Northbound					Auto Center Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	2	0	0	0	2	0	0	4	0	4	0	0	0	0	0	0	0	0	1	0	0	7	7
04:15 PM	3	1	0	0	4	0	1	5	0	6	0	0	0	0	0	0	1	0	0	1	0	11	11
04:30 PM	1	0	0	0	1	0	2	1	0	3	0	0	0	0	0	0	0	3	1	3	1	7	8
04:45 PM	1	0	1	0	2	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	6	6
Total	7	1	1	0	9	0	3	14	0	17	0	0	0	0	0	0	1	4	1	5	1	31	32
05:00 PM	0	0	0	0	0	0	2	2	0	4	0	0	0	0	0	0	2	2	1	4	1	8	9
05:15 PM	2	1	1	0	4	0	0	2	0	2	0	0	0	0	0	0	1	1	0	2	0	8	8
05:30 PM	2	0	0	0	2	0	1	1	0	2	0	0	0	0	0	0	0	1	1	1	1	5	6
05:45 PM	2	0	0	0	2	0	0	6	0	6	0	0	0	0	0	0	0	1	0	1	0	9	9
Total	6	1	1	0	8	0	3	11	0	14	0	0	0	0	0	0	3	5	2	8	2	30	32
Grand Total	13	2	2	0	17	0	6	25	0	31	0	0	0	0	0	0	4	9	3	13	3	61	64
Approach %	76.5	11.8	11.8			0	19.4	80.6			0	0	0	0	0	0	30.8	69.2		21.3	4.7	95.3	
Total %	21.3	3.3	3.3		27.9	0	9.8	41		50.8	0	0	0	0	0	0	6.6	14.8					

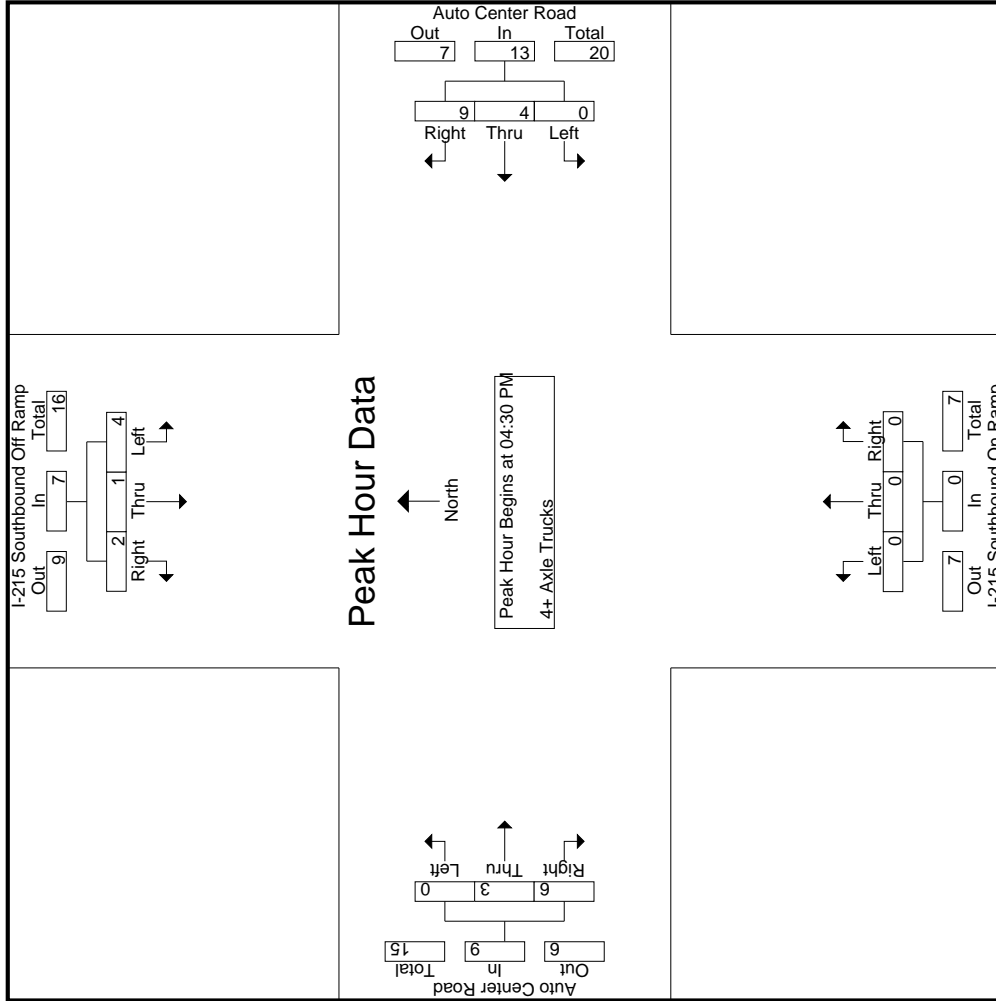
Start Time	I-215 Southbound Off Ramp Southbound					Auto Center Road Westbound					I-215 Southbound On Ramp Northbound					Auto Center Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:30 PM	1	0	0	0	1	0	2	1	3	3	0	0	0	0	0	0	0	0	0	0	0	3	3
04:45 PM	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	2	2	0	4	0	0	0	0	0	0	0	0	0	0	0	2	4
05:15 PM	2	1	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
Total Volume	4	1	2		7	0	4	9		13	0	0	0	0	0	0	3	6		9	6	29	29
% App. Total	57.1	14.3	28.6		28.6	0	30.8	69.2		69.2	0	0	0	0	0	0	33.3	66.7		66.7			
PHF	.500	.250	.500		.438	.000	.500	.563		.813	.000	.000	.000	.000	.000	.000	.375	.500		.563			.906

Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:30 PM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Road
 Weather: Clear

File Name : 01-SBC215SAUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Road
 Weather: Clear

File Name : 01-SBC215SAUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	I-215 Southbound Off Ramp Southbound			Auto Center Road Westbound			I-215 Southbound On Ramp Northbound			Auto Center Road Eastbound				
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1	Peak Hour for Each Approach Begins at:													
	04:30 PM													
+0 mins.	1	0	0	2	1	3	0	0	0	0	0	3	0	3
+15 mins.	1	0	1	0	4	4	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	2	2	4	0	0	0	0	2	2	4	4
+45 mins.	2	1	1	0	2	2	0	0	0	0	1	1	2	2
Total Volume	4	1	2	4	9	13	0	0	0	0	3	6	9	9
% App. Total	57.1	14.3	28.6	30.8	69.2	81.3	0	0	0	0	33.3	66.7	66.7	66.7
PHF	.500	.250	.500	.500	.563	.813	.000	.000	.000	.000	.375	.500	.500	.563

Location: San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Drive



Date: 3/2/2017
 Day: Thursday

PEDESTRIANS

	North Leg I-215 Southbound Ramps	East Leg Auto Center Drive	South Leg I-215 Southbound Ramps	West Leg Auto Center Drive	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

	North Leg I-215 Southbound Ramps	East Leg Auto Center Drive	South Leg I-215 Southbound Ramps	West Leg Auto Center Drive	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	1	0	1
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	0	1	0	1

Location: San Bernardino
 N/S: I-215 Southbound Ramps
 E/W: Auto Center Drive



Date: 3/2/2017
 Day: Thursday

BICYCLES

	North Leg I-215 Southbound Ramps	East Leg Auto Center Drive	South Leg I-215 Southbound Ramps	West Leg Auto Center Drive	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

	North Leg I-215 Southbound Ramps	East Leg Auto Center Drive	South Leg I-215 Southbound Ramps	West Leg Auto Center Drive	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	1	0	1
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	0	1	0	1

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Road/Orange Show Road
 Weather: Clear

File Name : 02-SBC215NAUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

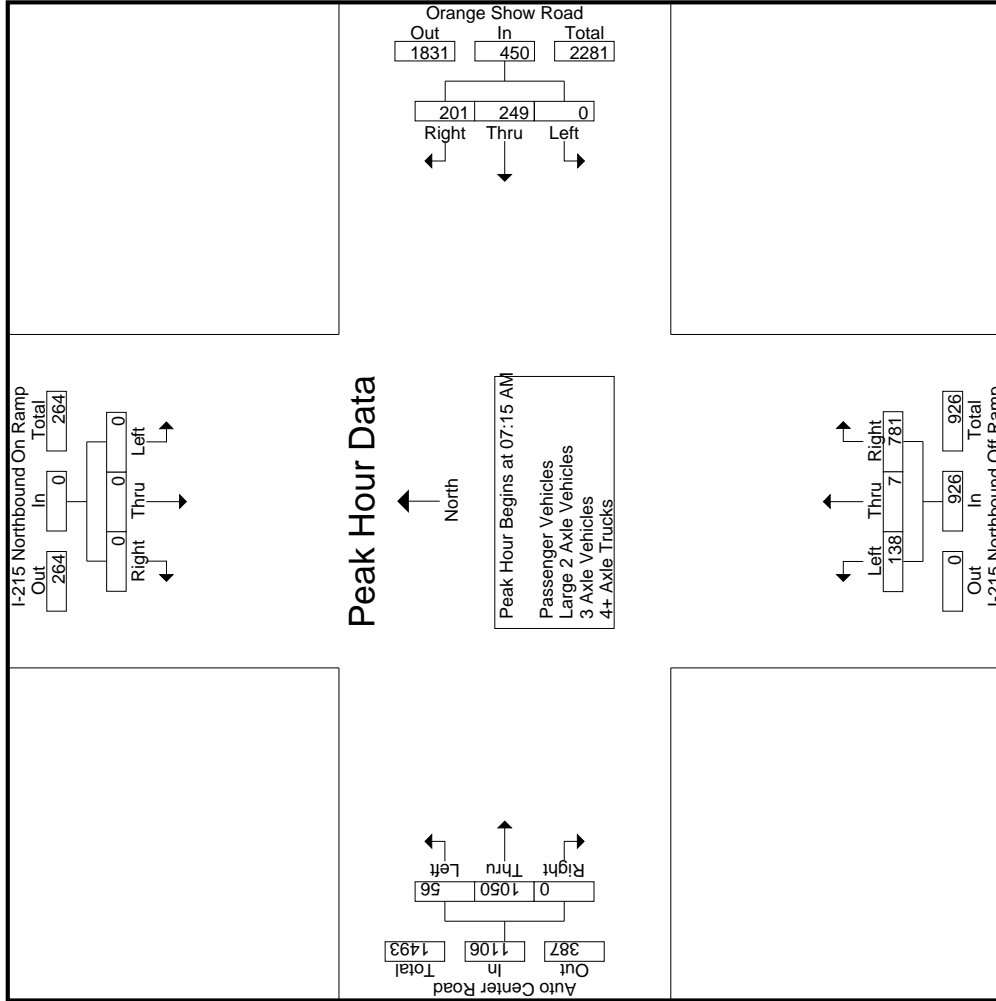
Start Time	Orange Show Road Westbound												I-215 Northbound Off Ramp Northbound						Auto Center Road Eastbound					
	I-215 Northbound On Ramp Southbound			I-215 Northbound On Ramp Southbound			I-215 Northbound Off Ramp Northbound			I-215 Northbound Off Ramp Northbound			Auto Center Road Eastbound			Auto Center Road Eastbound								
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Exclu. Total	Inclu. Total	Int. Total			
07:00 AM	0	0	0	0	74	38	7	112	112	20	0	129	54	149	149	11	153	0	164	61	425			
07:15 AM	0	0	0	0	45	33	8	78	78	25	0	158	43	183	183	15	271	0	286	51	547			
07:30 AM	0	0	0	0	64	53	25	117	117	48	1	176	31	225	225	9	226	0	235	56	577			
07:45 AM	0	0	0	0	57	50	20	107	107	34	1	234	31	269	269	16	288	0	304	51	680			
Total	0	0	0	0	240	174	60	414	414	127	2	697	159	826	826	51	938	0	989	219	2229			
08:00 AM	0	0	0	0	83	65	22	148	148	31	5	213	40	249	249	16	265	0	281	62	678			
08:15 AM	0	0	0	0	76	58	23	134	134	34	1	194	71	229	229	15	141	0	156	94	519			
08:30 AM	0	0	0	0	68	40	13	108	108	33	1	184	50	218	218	17	151	0	168	63	494			
08:45 AM	0	0	0	0	79	47	14	126	126	48	1	215	38	264	264	27	176	0	203	52	593			
Total	0	0	0	0	306	210	72	516	516	146	8	806	199	960	960	75	733	0	808	271	2284			
Grand Total	0	0	0	0	546	384	132	930	930	273	10	1503	358	1786	1786	126	1671	0	1797	490	4513			
Approach %	0	0	0	0	58.7	41.3				15.3	0.6	84.2				7	93	0						
Total %	0	0	0	0	12.1	8.5		20.6		6	0.2	33.3		39.6		2.8	37	0	39.8	9.8	90.2			
% Passenger Vehicles	0	0	0	0	47.1	32.2		90.1		26.0	9	140.7		20.0		11.3	157.0	0	168.3	0	459.4			
% Large 2-Axle Vehicles	0	0	0	0	86.3	83.9		81.8		95.2	90	93.6		93.3		93.8	94	0	93.7	0	91.8			
% Large 3-Axle Vehicles	0	0	0	0	4.6	4.6		11.3		5	1	5.4		5		1	7.8	0	7.9	0	27.0			
% 3-Axle Vehicles	0	0	0	0	8.4	12		10.6		1.8	10	3.6		5		0.8	4.7	0	4.4	0	5.4			
% 4+ Axle Trucks	0	0	0	0	8	12		2.1		1	0	1.2		1.5		10	4	0	14	0	5.1			
% 4+ Axle Trucks	0	0	0	0	1.5	3.1		2.1		0.4	0	0.8		0.6		7.9	0.2	0	0.8	0	1			
% 4+ Axle Trucks	0	0	0	0	21	4		26		7	0	30		4.1		2	19	0	21	0	88			
% 4+ Axle Trucks	0	0	0	0	3.8	1		0.8		2.6	0	2		1.9		1.6	1.1	0	1.2	0	1.8			

Start Time	Orange Show Road Westbound						I-215 Northbound Off Ramp Northbound						Auto Center Road Eastbound								
	I-215 Northbound On Ramp Southbound			I-215 Northbound On Ramp Southbound			I-215 Northbound Off Ramp Northbound			I-215 Northbound Off Ramp Northbound			Auto Center Road Eastbound			Auto Center Road Eastbound					
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Exclu. Total	Inclu. Total	Int. Total
07:15 AM	0	0	0	0	45	33	78	78	78	25	0	158	0	158	158	15	271	0	286	61	425
07:30 AM	0	0	0	0	64	53	117	117	117	48	1	176	1	176	176	9	226	0	235	51	547
07:45 AM	0	0	0	0	57	50	107	107	107	34	1	234	1	234	234	16	288	0	304	56	577
08:00 AM	0	0	0	0	83	65	148	148	148	31	5	213	5	213	213	16	265	0	281	61	425
Total Volume	0	0	0	0	249	201	450	450	450	138	7	781	7	781	781	56	1050	0	1106	219	2229
% App. Total	0	0	0	0	55.3	44.7	.760	.760	.760	.350	.350	.350	.834	.834	.834	.875	.911	.000	.910	.910	.910
PHF	.000	.000	.000	.000	.750	.773	.760	.760	.760	.350	.350	.350	.834	.834	.834	.875	.911	.000	.910	.910	.910

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Road/Orange Show Road
 Weather: Clear

File Name : 02-SBC215NAUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
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City of San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Road/Orange Show Road
 Weather: Clear

File Name : 02-SBC215NAUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	I-215 Northbound On Ramp Southbound			Orange Show Road Westbound			I-215 Northbound Off Ramp Northbound			Auto Center Road Eastbound					
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1															
Peak Hour for Each Approach Begins at:															
	07:00 AM			08:00 AM			07:30 AM			07:15 AM					
+0 mins.	0	0	0	0	83	65	148	48	1	176	225	15	271	0	286
+15 mins.	0	0	0	0	76	58	134	34	1	234	269	9	226	0	235
+30 mins.	0	0	0	0	68	40	108	31	5	213	249	16	288	0	304
+45 mins.	0	0	0	0	79	47	126	34	1	194	229	16	265	0	281
Total Volume	0	0	0	0	306	210	516	147	8	817	972	56	1050	0	1106
% App. Total	0	0	0	0	59.3	40.7		15.1	0.8	84.1		5.1	94.9	0	
PHF	.000	.000	.000	.000	.922	.808	.872	.766	.400	.873	.903	.875	.911	.000	.910

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Road/Orange Show Road
 Weather: Clear

File Name : 02-SBC215NAUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles

Start Time	I-215 Northbound On Ramp Southbound					Orange Show Road Westbound					I-215 Northbound Off Ramp Northbound					Auto Center Road Eastbound					Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total			
07:00 AM	0	0	0	0	0	0	61	31	5	92	17	0	124	52	141	9	151	0	0	160	57	393	450
07:15 AM	0	0	0	0	0	0	39	24	5	63	24	0	153	42	177	10	265	0	0	275	47	515	562
07:30 AM	0	0	0	0	0	0	56	42	22	98	48	1	162	27	211	8	221	0	0	229	49	538	587
07:45 AM	0	0	0	0	0	0	45	36	12	81	34	1	227	31	262	15	283	0	0	298	43	641	684
Total	0	0	0	0	0	0	201	133	44	334	123	2	666	152	791	42	920	0	0	962	196	2087	2283
08:00 AM	0	0	0	0	0	0	73	57	19	130	31	4	194	33	229	15	258	0	0	273	52	632	684
08:15 AM	0	0	0	0	0	0	67	53	21	120	32	1	181	68	214	15	136	0	0	151	89	485	574
08:30 AM	0	0	0	0	0	0	60	36	12	96	30	1	170	45	201	17	129	0	0	146	57	443	500
08:45 AM	0	0	0	0	0	0	70	43	12	113	44	1	196	36	241	24	127	0	0	151	48	505	553
Total	0	0	0	0	0	0	270	189	64	459	137	7	741	182	885	71	650	0	0	721	246	2065	2311
Grand Total	0	0	0	0	0	0	471	322	108	793	260	9	1407	334	1676	113	1570	0	0	1683	442	4152	4594
Approach %	0	0	0	0	0	0	59.4	40.6		19.1	15.5	0.5	83.9		40.4	6.7	93.3	0		40.5	9.6	90.4	
Total %	0	0	0	0	0	0	11.3	7.8			6.3	0.2	33.9			2.7	37.8	0					

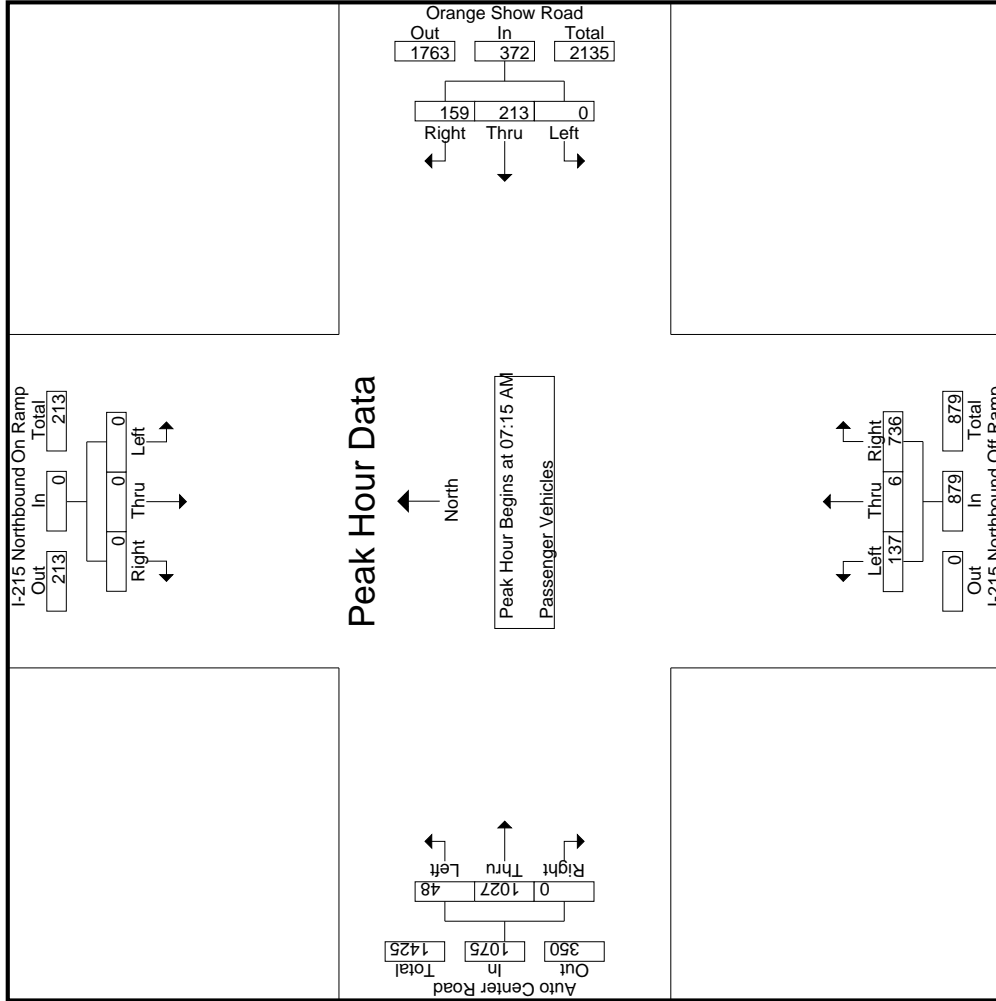
Start Time	I-215 Northbound On Ramp Southbound					Orange Show Road Westbound					I-215 Northbound Off Ramp Northbound					Auto Center Road Eastbound					Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total			
07:15 AM	0	0	0	0	0	0	39	24		24	0	153		177	10	265	0		275	0	275	515	
07:30 AM	0	0	0	0	0	0	56	42		48	1	162		211	8	221	0		229	0	229	538	
07:45 AM	0	0	0	0	0	0	45	36		34	1	227		262	15	283	0		298	0	298	641	
08:00 AM	0	0	0	0	0	0	73	57		31	4	194		229	15	258	0		273	0	273	632	
Total Volume	0	0	0	0	0	0	213	159		137	6	736		879	48	1027	0		1075	0	1075	2326	
% App. Total	0	0	0	0	0	0	57.3	42.7		15.6	0.7	83.7		4.5	95.5	95.5	0		95.5	0	95.5	2326	
PHF	.000	.000	.000	.000	.000	.000	.729	.697		.714	.375	.811		.839	.800	.907	.000		.902	.000	.902	.907	

Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:15 AM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Road/Orange Show Road
 Weather: Clear

File Name : 02-SBC215NAUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Road/Orange Show Road
 Weather: Clear

File Name : 02-SBC215NAUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	I-215 Northbound On Ramp Southbound			Orange Show Road Westbound			I-215 Northbound Off Ramp Northbound			Auto Center Road Eastbound					
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total	
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1															
Peak Hour for Each Approach Begins at:															
	07:15 AM														
+0 mins.	0	0	0	0	39	24	63	24	0	153	177	10	265	0	275
+15 mins.	0	0	0	0	56	42	98	48	1	162	211	8	221	0	229
+30 mins.	0	0	0	0	45	36	81	34	1	227	262	15	283	0	298
+45 mins.	0	0	0	0	73	57	130	31	4	194	229	15	258	0	273
Total Volume	0	0	0	0	213	159	372	137	6	736	879	48	1027	0	1075
% App. Total	0	0	0	0	57.3	42.7	71.5	15.6	0.7	83.7	83.9	4.5	95.5	0	107.5
PHF	.000	.000	.000	.000	.729	.697	.715	.714	.375	.811	.839	.800	.907	.000	.902

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Road/Orange Show Road
 Weather: Clear

File Name : 02-SBC215NAUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Large 2 Axle Vehicles

Start Time	I-215 Northbound On Ramp Southbound					Orange Show Road Westbound					I-215 Northbound Off Ramp Northbound					Auto Center Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	9	7	2	16	0	0	4	2	4	1	1	0	0	2	4	22	26
07:15 AM	0	0	0	0	0	0	3	7	2	10	0	0	3	0	3	0	3	0	0	3	2	16	18
07:30 AM	0	0	0	0	0	0	7	6	2	13	0	0	6	2	6	0	1	0	0	1	4	20	24
07:45 AM	0	0	0	0	0	0	8	14	8	22	0	0	3	0	3	0	0	0	0	0	8	25	33
Total	0	0	0	0	0	0	27	34	14	61	0	0	16	4	16	1	5	0	0	6	18	83	101
08:00 AM	0	0	0	0	0	0	8	5	3	13	0	1	15	5	16	0	3	0	0	3	8	32	40
08:15 AM	0	0	0	0	0	0	4	2	2	6	1	0	6	3	7	0	2	0	0	2	5	15	20
08:30 AM	0	0	0	0	0	0	5	3	1	8	2	0	7	4	9	0	19	0	0	19	5	36	41
08:45 AM	0	0	0	0	0	0	2	2	1	4	2	0	10	2	12	0	49	0	0	49	3	65	68
Total	0	0	0	0	0	0	19	12	7	31	5	1	38	14	44	0	73	0	0	73	21	148	169
Grand Total	0	0	0	0	0	0	46	46	21	92	5	1	54	18	60	1	78	0	0	79	39	231	270
Approach %	0	0	0	0	0	0	50	50		39.8	8.3	1.7	90		26	1.3	98.7	0		34.2	14.4	85.6	
Total %	0	0	0	0	0	0	19.9	19.9		39.8	2.2	0.4	23.4		26	0.4	33.8	0		34.2	14.4	85.6	

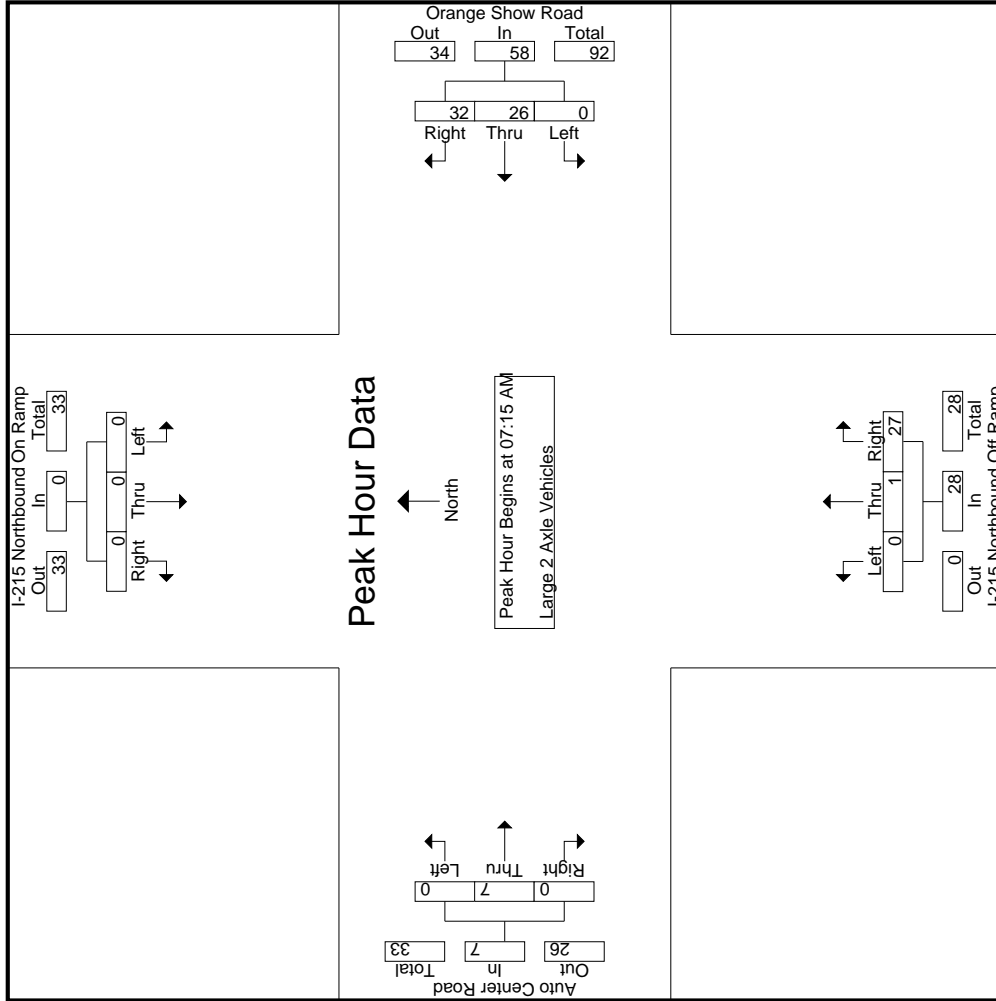
Start Time	I-215 Northbound On Ramp Southbound					Orange Show Road Westbound					I-215 Northbound Off Ramp Northbound					Auto Center Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:15 AM	0	0	0	0	0	0	0	3	7	10	0	0	0	0	3	0	0	0	0	3	0	0	3
07:30 AM	0	0	0	0	0	0	7	6	6	13	0	0	0	0	6	0	1	0	0	1	0	1	20
07:45 AM	0	0	0	0	0	0	8	14	8	22	0	0	0	0	3	0	0	0	0	3	0	0	25
08:00 AM	0	0	0	0	0	0	8	5	5	13	0	1	15	1	15	0	3	0	0	3	0	3	32
Total Volume	0	0	0	0	0	0	26	32	26	58	0	1	27	1	27	0	7	0	0	7	0	7	93
% App. Total	0	0	0	0	0	0	44.8	55.2		55.2	0	3.6	96.4		96.4	0	100	0		100	0	0	
PHF	.000	.000	.000	.000	.000	.000	.813	.571		.659	.000	.250	.450		.438	.000	.583	.000		.583	.000	.583	.727

Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:15 AM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Road/Orange Show Road
 Weather: Clear

File Name : 02-SBC215NAUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Road/Orange Show Road
 Weather: Clear

File Name : 02-SBC215NAUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	I-215 Northbound On Ramp Southbound			Orange Show Road Westbound			I-215 Northbound Off Ramp Northbound			Auto Center Road Eastbound				
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	07:15 AM													
+0 mins.	0	0	0	0	3	7	10	0	0	3	0	0	3	3
+15 mins.	0	0	0	0	7	6	13	0	0	6	0	1	6	1
+30 mins.	0	0	0	0	8	14	22	0	0	3	0	0	3	0
+45 mins.	0	0	0	0	8	5	13	0	1	15	0	3	16	3
Total Volume	0	0	0	0	26	32	58	0	1	27	0	7	28	7
% App. Total	0	0	0	0	44.8	55.2	100.0	0	3.6	96.4	0	100	100.0	0
PHF	.000	.000	.000	.000	.813	.571	.659	.000	.250	.450	.000	.583	.438	.583

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Road/Orange Show Road
 Weather: Clear

File Name : 02-SBC215NAUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 3 Axle Vehicles

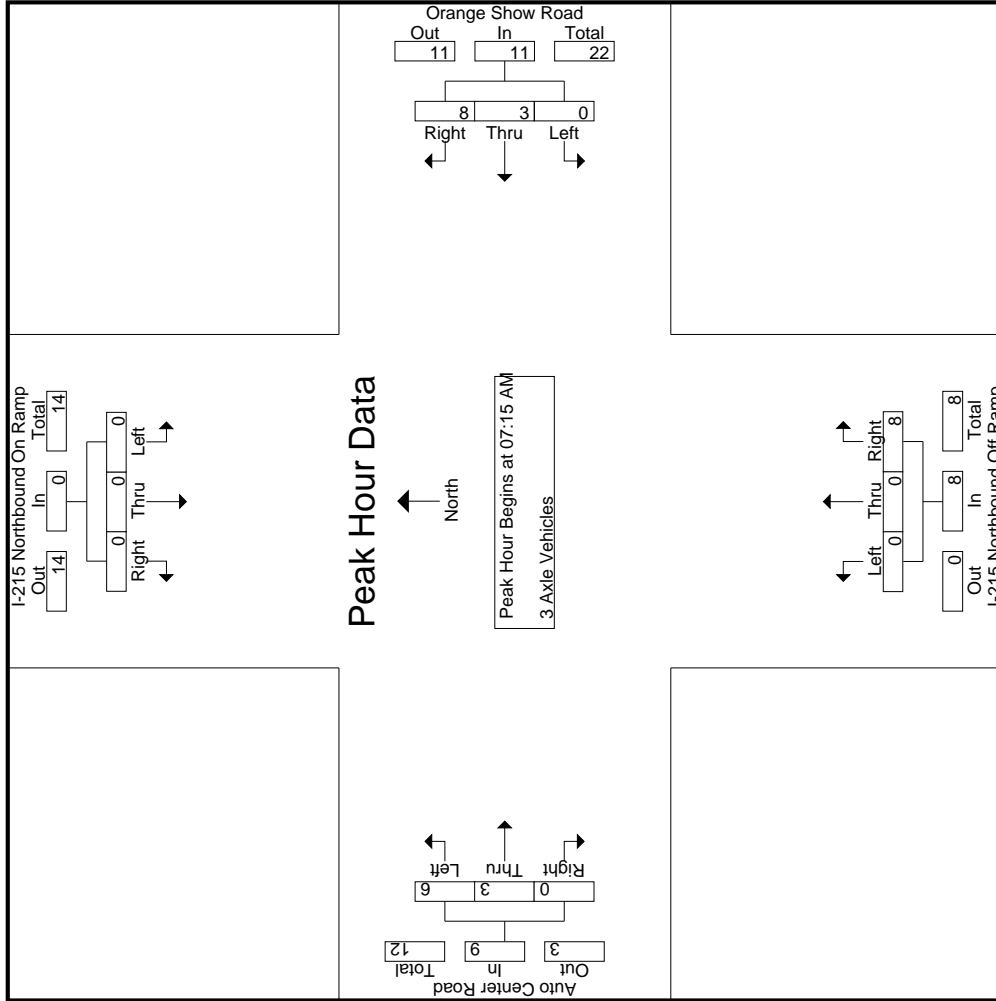
Start Time	I-215 Northbound On Ramp Southbound					Orange Show Road Westbound					I-215 Northbound Off Ramp Northbound					Auto Center Road Eastbound										
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total			
07:00 AM	0	0	0	0	0	0	2	0	0	2	1	0	1	0	2	1	0	0	0	1	0	0	5	0	5	5
07:15 AM	0	0	0	0	0	0	1	1	1	2	0	0	0	0	0	0	0	0	0	0	1	1	7	0	7	8
07:30 AM	0	0	0	0	0	0	0	4	0	4	0	0	3	0	3	1	1	0	0	2	0	0	9	0	9	9
07:45 AM	0	0	0	0	0	0	1	0	0	1	0	0	3	0	3	0	0	0	0	0	0	0	4	0	4	4
Total	0	0	0	0	0	0	4	5	1	9	1	0	7	0	8	7	1	0	0	8	1	25	26	1	25	26
08:00 AM	0	0	0	0	0	0	1	3	0	4	0	0	2	2	2	0	2	0	0	2	2	8	10	2	8	10
08:15 AM	0	0	0	0	0	0	1	1	0	2	0	0	1	0	1	0	0	0	0	0	0	0	3	0	3	3
08:30 AM	0	0	0	0	0	0	0	1	0	1	0	0	2	0	2	0	1	0	0	1	0	0	4	0	4	4
08:45 AM	0	0	0	0	0	0	2	2	1	4	0	0	0	0	0	3	0	0	0	3	1	7	8	1	7	8
Total	0	0	0	0	0	0	4	7	1	11	0	0	5	2	5	3	3	0	0	6	3	22	25	3	22	25
Grand Total	0	0	0	0	0	0	8	12	2	20	1	0	12	2	13	10	4	0	0	14	4	47	51	4	47	51
Approach %	0	0	0	0	0	0	40	60		42.6	7.7	0	92.3		27.7	71.4	28.6	0		29.8	7.8	92.2		7.8	92.2	
Total %	0	0	0	0	0	0	17	25.5		42.6	2.1	0	25.5		27.7	21.3	8.5	0		29.8	7.8	92.2		7.8	92.2	

Start Time	I-215 Northbound On Ramp Southbound					Orange Show Road Westbound					I-215 Northbound Off Ramp Northbound					Auto Center Road Eastbound										
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total			
07:15 AM	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	1	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	3	3	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	27.3	72.7	72.7	0	0	0	0	100	66.7	33.3	0		33.3	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.750	.500	.667	.000	.000	.000	.667	.667	.300	.375	.000		.450	.000	.450	.778	.000	.450	.778

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Road/Orange Show Road
 Weather: Clear

File Name : 02-SBC215NAUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Road/Orange Show Road
 Weather: Clear

File Name : 02-SBC215NAUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	I-215 Northbound On Ramp Southbound			Orange Show Road Westbound			I-215 Northbound Off Ramp Northbound			Auto Center Road Eastbound				
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	07:15 AM													
+0 mins.	0	0	0	0	1	1	0	0	0	0	0	0	5	0
+15 mins.	0	0	0	0	0	4	0	0	0	0	1	1	3	0
+30 mins.	0	0	0	0	0	0	1	0	0	0	0	0	3	0
+45 mins.	0	0	0	0	1	3	1	0	0	0	0	2	2	0
Total Volume	0	0	0	0	3	8	11	0	0	0	8	3	8	0
% App. Total	0	0	0	0	27.3	72.7	100	0	0	100	66.7	33.3	66.7	0
PHF	.000	.000	.000	.000	.750	.500	.688	.000	.000	.667	.300	.375	.667	.450

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Road/Orange Show Road
 Weather: Clear

File Name : 02-SBC215NAUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 4+ Axle Trucks

Start Time	I-215 Northbound On Ramp Southbound					Orange Show Road Westbound					I-215 Northbound Off Ramp Northbound					Auto Center Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	2	0	0	2	2	0	0	0	2	0	1	0	0	1	0	5	5
07:15 AM	0	0	0	0	0	0	2	1	0	3	1	0	2	1	3	0	3	0	0	3	1	9	10
07:30 AM	0	0	0	0	0	0	1	1	1	2	0	0	5	2	5	0	3	0	0	3	3	10	13
07:45 AM	0	0	0	0	0	0	3	0	0	3	0	0	1	0	1	1	5	0	0	6	0	10	10
Total	0	0	0	0	0	0	8	2	1	10	3	0	8	3	11	1	12	0	0	13	4	34	38
08:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	2	0	2	1	2	0	0	3	0	6	6
08:15 AM	0	0	0	0	0	0	4	2	0	6	1	0	6	0	7	0	3	0	0	3	0	16	16
08:30 AM	0	0	0	0	0	0	3	0	0	3	1	0	5	1	6	0	2	0	0	2	1	11	12
08:45 AM	0	0	0	0	0	0	5	0	0	5	2	0	9	0	11	0	0	0	0	0	0	16	16
Total	0	0	0	0	0	0	13	2	0	15	4	0	22	1	26	1	7	0	0	8	1	49	50
Grand Total	0	0	0	0	0	0	21	4	1	25	7	0	30	4	37	2	19	0	0	21	5	83	88
Approach %	0	0	0	0	0	0	84	16		30.1	18.9	0	81.1		44.6	9.5	90.5	0		25.3	5.7	94.3	
Total %	0	0	0	0	0	0	25.3	4.8		30.1	8.4	0	36.1		44.6	2.4	22.9	0		25.3	5.7	94.3	

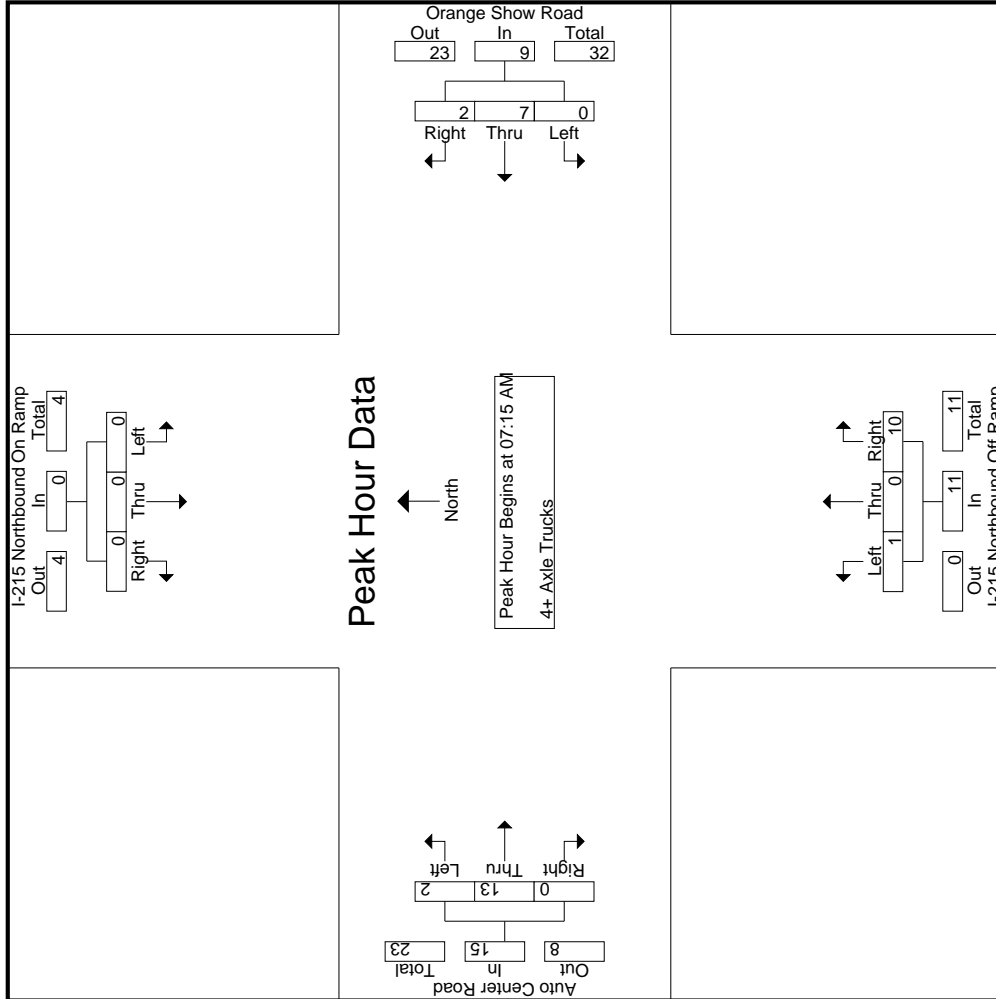
Start Time	I-215 Northbound On Ramp Southbound					Orange Show Road Westbound					I-215 Northbound Off Ramp Northbound					Auto Center Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:15 AM	0	0	0	0	0	0	2	0	0	2	1	0	0	0	1	0	3	0	0	3	0	3	3
07:30 AM	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	0	5	0	0	5	0	3	10
07:45 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	1	1	0	0	2	0	6	10
08:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2	2	0	0	4	0	3	6
Total Volume	0	0	0	0	0	0	7	2	0	9	1	0	10	0	11	2	13	0	0	15	0	15	35
% App. Total	0	0	0	0	0	0	77.8	22.2		90.9	9.1	0	90.9		90.9	13.3	86.7	0		25.3	5.7	94.3	
PHF	.000	.000	.000	.000	.000	.000	.583	.500		.750	.250	.000	.500		.550	.500	.650	.000		.625	.000	.625	.875

Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:15 AM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Road/Orange Show Road
 Weather: Clear

File Name : 02-SBC215NAUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Road/Orange Show Road
 Weather: Clear

File Name : 02-SBC215NAUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	I-215 Northbound On Ramp Southbound			Orange Show Road Westbound			I-215 Northbound Off Ramp Northbound			Auto Center Road Eastbound				
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	07:15 AM													
+0 mins.	0	0	0	0	2	1	3	1	0	2	3	0	3	3
+15 mins.	0	0	0	0	1	1	2	0	0	5	0	3	5	3
+30 mins.	0	0	0	0	3	0	3	0	0	1	1	5	1	6
+45 mins.	0	0	0	0	1	0	1	0	0	2	1	2	2	3
Total Volume	0	0	0	0	7	2	9	1	0	10	2	13	11	15
% App. Total	0	0	0	0	77.8	22.2	9	9.1	0	90.9	13.3	86.7	0	0
PHF	.000	.000	.000	.000	.583	.500	.750	.250	.000	.500	.500	.650	.550	.625

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Road/Orange Show Road
 Weather: Clear

File Name : 02-SBC215NAUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	I-215 Northbound On Ramp Southbound					Orange Show Road Westbound					I-215 Northbound Off Ramp Northbound					Auto Center Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	189	147	46	336	23	4	213	91	240	42	176	0	0	218	137	794	931
04:15 PM	0	0	0	0	0	0	161	147	49	308	31	6	212	38	249	35	186	0	0	221	87	778	865
04:30 PM	0	0	0	0	0	0	198	158	47	356	32	0	227	82	259	46	181	0	0	227	129	842	971
04:45 PM	0	0	0	0	0	0	182	145	51	327	31	2	217	89	250	52	168	0	0	220	140	797	937
Total	0	0	0	0	0	0	730	597	193	1327	117	12	869	300	998	175	711	0	0	886	493	3211	3704
05:00 PM	0	0	0	0	0	0	223	145	45	368	24	3	209	111	236	62	166	0	0	228	156	832	988
05:15 PM	0	0	0	0	0	0	186	163	57	349	18	2	187	45	207	60	204	0	0	264	102	820	922
05:30 PM	0	0	0	0	0	0	158	160	61	318	30	10	229	47	269	33	196	0	0	229	108	816	924
05:45 PM	0	0	0	0	0	0	152	128	40	280	27	6	229	43	262	31	186	0	0	217	83	759	842
Total	0	0	0	0	0	0	719	596	203	1315	99	21	854	246	974	186	752	0	0	938	449	3227	3676
Grand Total	0	0	0	0	0	0	1449	1193	396	2642	216	33	1723	546	1972	361	1463	0	0	1824	942	6438	7380
Approach %	0	0	0	0	0	0	54.8	45.2			11	1.7	87.4			19.8	80.2	0	0				
Total %	0	0	0	0	0	0	22.5	18.5	41		3.4	0.5	26.8	30.6		5.6	22.7	0	28.3		12.8	87.2	
Passenger Vehicles	0	0	0	0	0	0	1391	1165	2944	208	33	1627	2381	358	1347	0	0	1705	0	0	7030		
% Passenger Vehicles	0	0	0	0	0	0	96	97.7	98	96.3	100	94.4	94	94.6	99.2	92.1	0	0	93.5	0	0	95.3	
Large 2 Axle Vehicles	0	0	0	0	0	0	27	9	37	4	0	40	61	1	93	0	0	94	0	0	192		
% Large 2 Axle Vehicles	0	0	0	0	0	0	1.9	0.8	1.2	1.9	0	2.3	3.1	2.4	6.4	0	0	5.2	0	0	2.6		
3 Axle Vehicles	0	0	0	0	0	0	7	10	21	0	0	15	22	1	10	0	0	11	0	0	54		
% 3 Axle Vehicles	0	0	0	0	0	0	0.5	0.8	1	0.7	0	0.9	1.3	0.9	0.7	0	0	0.6	0	0	0.7		
4+ Axle Trucks	0	0	0	0	0	0	24	9	36	4	0	41	54	1	13	0	0	14	0	0	104		
% 4+ Axle Trucks	0	0	0	0	0	0	1.7	0.8	1.2	1.9	0	2.4	1.6	2.1	0.3	0.9	0	0.8	0	0	1.4		

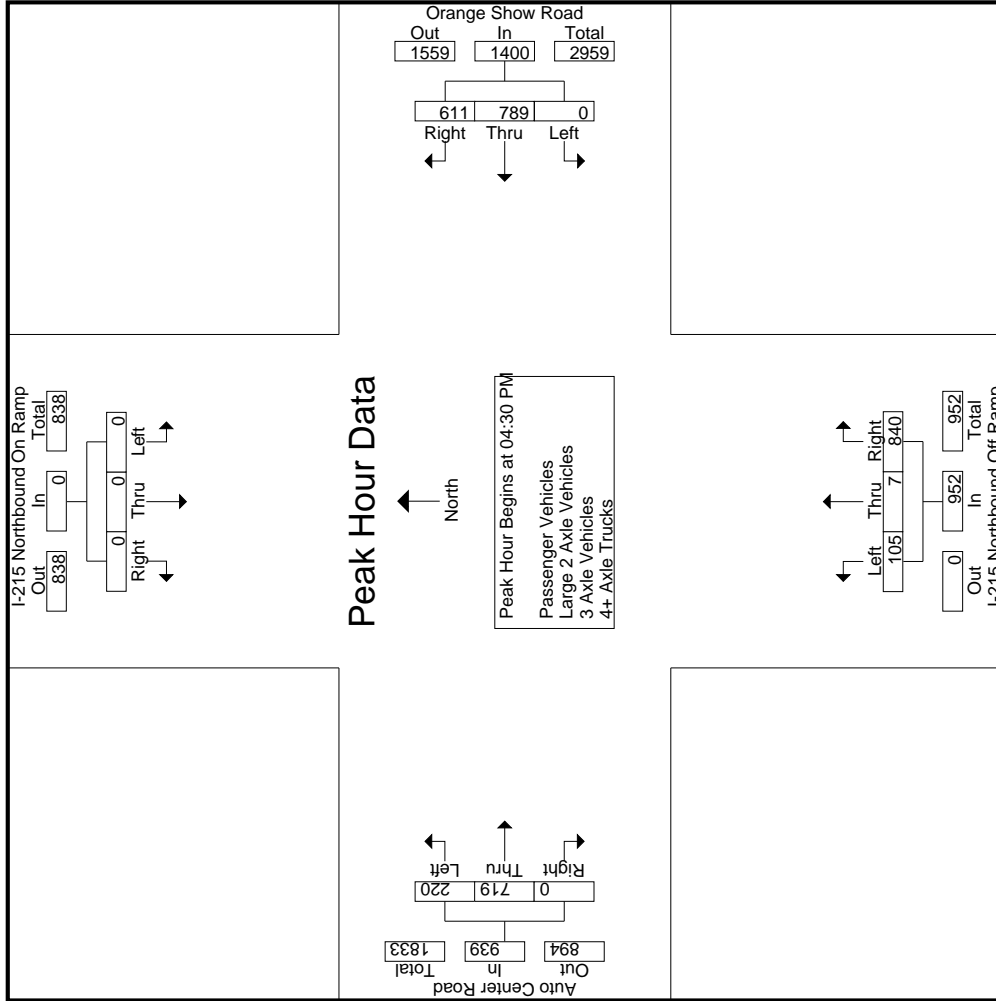
Start Time	I-215 Northbound On Ramp Southbound					Orange Show Road Westbound					I-215 Northbound Off Ramp Northbound					Auto Center Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:30 PM	0	0	0	0	0	0	198	158			32	0	227			46	181	0	0	227	0	227	842
04:45 PM	0	0	0	0	0	0	182	145			31	2	217			52	168	0	0	220	0	220	797
05:00 PM	0	0	0	0	0	0	223	145			24	3	209			62	166	0	0	228	0	228	832
05:15 PM	0	0	0	0	0	0	186	163			18	2	187			60	204	0	0	264	0	264	820
Total Volume	0	0	0	0	0	0	789	611			105	7	840			220	719	0	0	939	0	939	3291
% App. Total	0	0	0	0	0	0	56.4	43.6			11	0.7	88.2			23.4	76.6	0	0		0		
PHF	.000	.000	.000	.000	.000	.000	.885	.937			.820	.583	.925			.887	.881	.000	.000	.889	.000	.889	.977

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:30 PM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Road/Orange Show Road
 Weather: Clear

File Name : 02-SBC215NAUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Road/Orange Show Road
 Weather: Clear

File Name : 02-SBC215NAUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	I-215 Northbound On Ramp Southbound			Orange Show Road Westbound			I-215 Northbound Off Ramp Northbound			Auto Center Road Eastbound				
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	04:00 PM			04:30 PM			04:00 PM			04:45 PM				
+0 mins.	0	0	0	0	198	158	356	23	4	213	52	168	0	220
+15 mins.	0	0	0	0	182	145	327	31	6	212	62	166	0	228
+30 mins.	0	0	0	0	223	145	368	32	0	227	60	204	0	264
+45 mins.	0	0	0	0	186	163	349	31	2	217	33	196	0	229
Total Volume	0	0	0	0	789	611	1400	117	12	869	207	734	0	941
% App. Total	0	0	0	0	56.4	43.6	951	11.7	1.2	87.1	22	78	0	941
PHF	.000	.000	.000	.000	.885	.937	.951	.914	.500	.957	.835	.900	.000	.891

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Road/Orange Show Road
 Weather: Clear

File Name : 02-SBC215NAUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles

Start Time	I-215 Northbound On Ramp Southbound					Orange Show Road Westbound					I-215 Northbound Off Ramp Northbound					Auto Center Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	179	144	46	323	21	4	196	84	221	40	150	0	0	190	130	734	864
04:15 PM	0	0	0	0	0	0	151	143	48	294	31	6	194	34	231	35	149	0	0	184	82	709	791
04:30 PM	0	0	0	0	0	0	192	155	47	347	29	0	218	78	247	46	163	0	0	209	125	803	928
04:45 PM	0	0	0	0	0	0	173	139	48	312	31	2	205	85	238	52	159	0	0	211	133	761	894
Total	0	0	0	0	0	0	695	581	189	1276	112	12	813	281	937	173	621	0	0	794	470	3007	3477
05:00 PM	0	0	0	0	0	0	219	140	44	359	22	3	196	104	221	61	161	0	0	222	148	802	950
05:15 PM	0	0	0	0	0	0	180	162	57	342	18	2	178	41	198	60	200	0	0	260	98	800	898
05:30 PM	0	0	0	0	0	0	156	157	61	313	29	10	221	45	260	33	188	0	0	221	106	794	900
05:45 PM	0	0	0	0	0	0	141	125	37	266	27	6	219	42	252	31	177	0	0	208	79	726	805
Total	0	0	0	0	0	0	696	584	199	1280	96	21	814	232	931	185	726	0	0	911	431	3122	3553
Grand Total	0	0	0	0	0	0	1391	1165	388	2556	208	33	1627	513	1868	358	1347	0	0	1705	901	6129	7030
Approach %	0	0	0	0	0	0	54.4	45.6		41.7	11.1	1.8	87.1		30.5	21	79	0	0	27.8	12.8	87.2	
Total %	0	0	0	0	0	0	22.7	19			3.4	0.5	26.5			5.8	22	0	0				

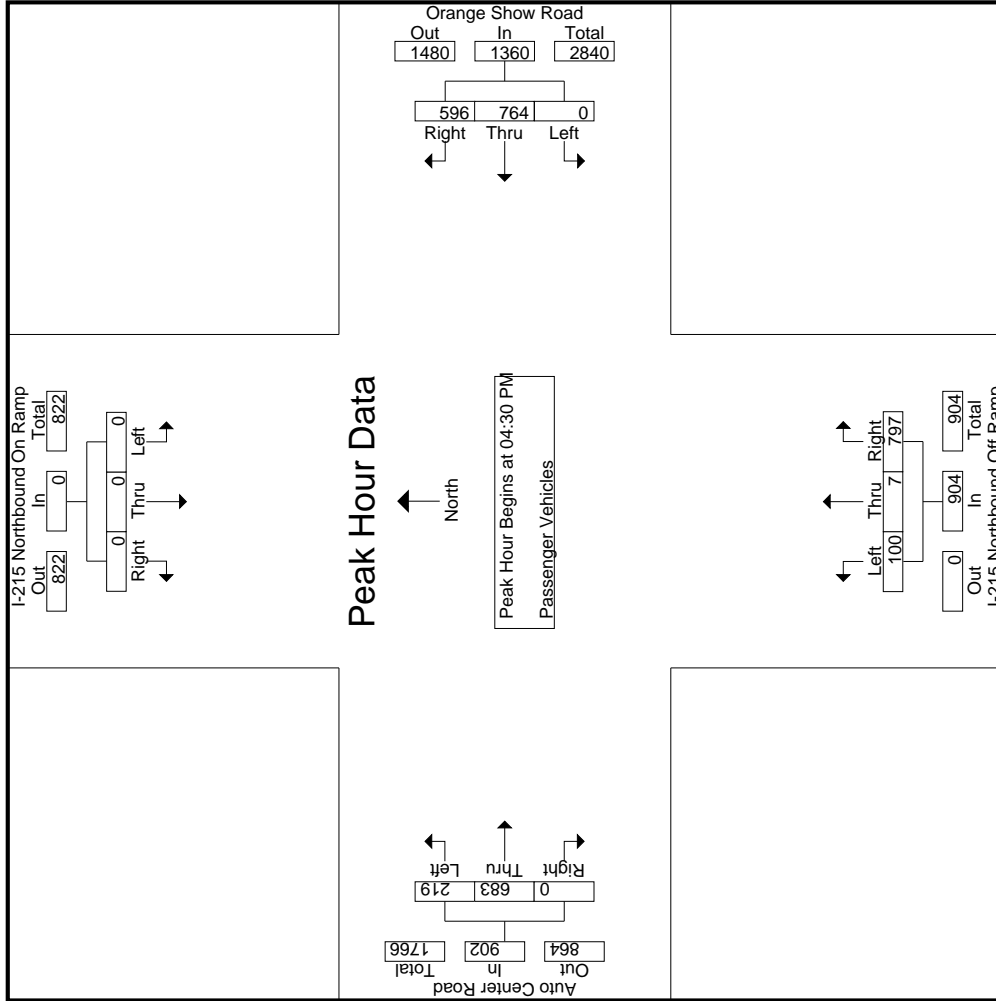
Start Time	I-215 Northbound On Ramp Southbound					Orange Show Road Westbound					I-215 Northbound Off Ramp Northbound					Auto Center Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:30 PM	0	0	0	0	0	0	192	155		155	29	0	218		218	46	163	0		209	0	209	803
04:45 PM	0	0	0	0	0	0	173	139		139	31	2	205		205	52	159	0		211	0	211	761
05:00 PM	0	0	0	0	0	0	219	140		140	22	3	196		196	61	161	0		222	0	222	802
05:15 PM	0	0	0	0	0	0	180	162		162	18	2	178		178	60	200	0		260	0	260	800
Total Volume	0	0	0	0	0	0	764	596		596	100	7	797		797	219	683	0		902	0	902	3166
% App. Total	0	0	0	0	0	0	56.2	43.8		43.8	11.1	0.8	88.2		88.2	24.3	75.7	0		87.2	0	87.2	.986
PHF	.000	.000	.000	.000	.000	.000	.872	.920		.920	.806	.583	.914		.914	.898	.854	.000		.867	.000	.867	

Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:30 PM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Road/Orange Show Road
 Weather: Clear

File Name : 02-SBC215NAUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Road/Orange Show Road
 Weather: Clear

File Name : 02-SBC215NAUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	I-215 Northbound On Ramp Southbound			Orange Show Road Westbound			I-215 Northbound Off Ramp Northbound			Auto Center Road Eastbound				
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	04:30 PM													
+0 mins.	0	0	0	0	192	155	347	29	0	218	46	163	0	209
+15 mins.	0	0	0	0	173	139	312	31	2	205	52	159	0	211
+30 mins.	0	0	0	0	219	140	359	22	3	196	61	161	0	222
+45 mins.	0	0	0	0	180	162	342	18	2	178	60	200	0	260
Total Volume	0	0	0	0	764	596	1360	100	7	797	219	683	0	902
% App. Total	0	0	0	0	56.2	43.8	94.7	11.1	0.8	88.2	24.3	75.7	0	90.2
PHF	.000	.000	.000	.000	.872	.920	.947	.806	.583	.914	.898	.854	.000	.867

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Road/Orange Show Road
 Weather: Clear

File Name : 02-SBC215NAUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Large 2 Axle Vehicles

Start Time	I-215 Northbound On Ramp Southbound					Orange Show Road Westbound					I-215 Northbound Off Ramp Northbound					Auto Center Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	6	2	0	8	2	0	10	5	12	1	24	0	0	25	5	45	50
04:15 PM	0	0	0	0	0	0	5	2	1	7	0	0	4	0	4	0	30	0	0	30	1	41	42
04:30 PM	0	0	0	0	0	0	6	0	0	6	1	0	6	3	7	0	16	0	0	16	3	29	32
04:45 PM	0	0	0	0	0	0	3	2	0	5	0	0	4	1	4	0	8	0	0	8	1	17	18
Total	0	0	0	0	0	0	20	6	1	26	3	0	24	9	27	1	78	0	0	79	10	132	142
05:00 PM	0	0	0	0	0	0	2	1	0	3	0	0	6	5	6	0	5	0	0	5	5	14	19
05:15 PM	0	0	0	0	0	0	3	1	0	4	0	0	2	1	2	0	1	0	0	1	1	7	8
05:30 PM	0	0	0	0	0	0	0	1	0	1	1	0	3	1	4	0	5	0	0	5	1	10	11
05:45 PM	0	0	0	0	0	0	2	0	0	2	0	0	5	1	5	0	4	0	0	4	1	11	12
Total	0	0	0	0	0	0	7	3	0	10	1	0	16	8	17	0	15	0	0	15	8	42	50
Grand Total	0	0	0	0	0	0	27	9	1	36	4	0	40	17	44	1	93	0	0	94	18	174	192
Approach %	0	0	0	0	0	0	75	25		20.7	9.1	0	90.9		25.3	1.1	98.9	0	0	54	9.4	90.6	
Total %	0	0	0	0	0	0	15.5	5.2			2.3	0	23			0.6	53.4	0	0				

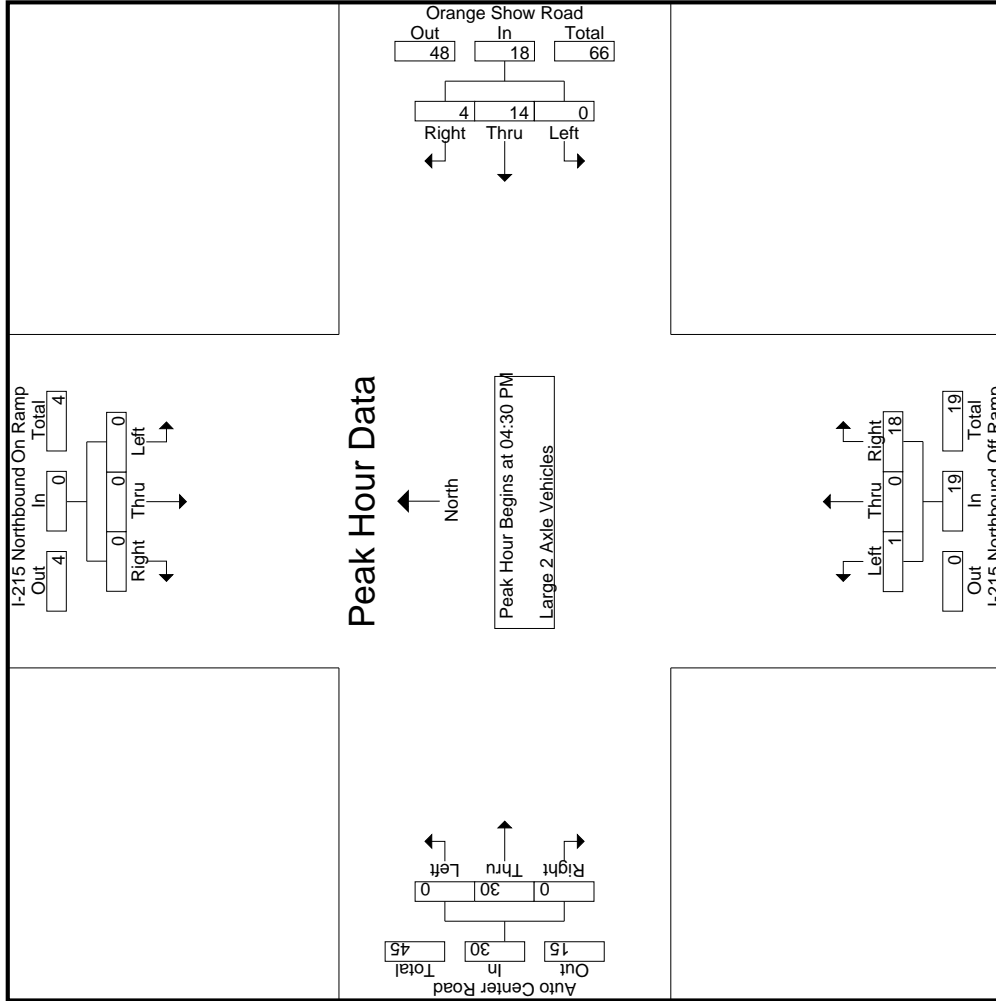
Start Time	I-215 Northbound On Ramp Southbound					Orange Show Road Westbound					I-215 Northbound Off Ramp Northbound					Auto Center Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.583	.500		.750	.250	.000	.750		.679	.000	.469	.000	.000	.469	.000	.469	.578

Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:30 PM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Road/Orange Show Road
 Weather: Clear

File Name : 02-SBC215NAUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Road/Orange Show Road
 Weather: Clear

File Name : 02-SBC215NAUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	I-215 Northbound On Ramp Southbound			Orange Show Road Westbound			I-215 Northbound Off Ramp Northbound			Auto Center Road Eastbound				
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	04:30 PM												04:30 PM	
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	3	2	0	0	0	0	4	4	0	8	0
+30 mins.	0	0	0	2	1	1	0	0	0	6	6	0	5	0
+45 mins.	0	0	0	3	1	1	0	0	0	2	2	0	1	0
Total Volume	0	0	0	14	4	4	1	0	18	19	30	0	0	30
% App. Total	0	0	0	77.8	22.2	22.2	5.3	0	94.7	0	100	0	0	0
PHF	.000	.000	.000	.583	.500	.500	.250	.000	.750	.679	.469	.000	.000	.469

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Road/Orange Show Road
 Weather: Clear

File Name : 02-SBC215NAUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 3 Axle Vehicles

Start Time	I-215 Northbound On Ramp Southbound					Orange Show Road Westbound					I-215 Northbound Off Ramp Northbound					Auto Center Road Eastbound								
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	4	1	4	1	0	0	0	0	1	1	5	6
04:15 PM	0	0	0	0	0	0	0	2	0	2	0	3	2	3	3	0	4	0	0	4	2	2	9	11
04:30 PM	0	0	0	0	0	0	0	2	0	2	0	1	1	1	1	0	1	0	0	1	1	1	4	5
04:45 PM	0	0	0	0	0	0	2	2	2	4	0	3	1	3	3	0	0	0	0	3	3	7	10	
Total	0	0	0	0	0	0	2	6	2	8	0	0	11	5	11	1	5	0	0	6	7	25	32	
05:00 PM	0	0	0	0	0	0	0	2	1	2	0	0	1	0	1	0	0	0	0	0	1	1	3	4
05:15 PM	0	0	0	0	0	0	2	0	0	2	0	1	1	1	1	0	1	0	0	1	1	1	4	5
05:30 PM	0	0	0	0	0	0	0	1	0	1	0	0	1	1	1	0	2	0	0	2	1	1	4	5
05:45 PM	0	0	0	0	0	0	3	1	1	4	0	0	1	0	1	0	2	0	0	2	1	1	7	8
Total	0	0	0	0	0	0	5	4	2	9	0	0	4	2	4	0	5	0	0	5	4	18	22	
Grand Total	0	0	0	0	0	0	7	10	4	17	0	0	15	7	15	1	10	0	0	11	11	43	54	
Approach %	0	0	0	0	0	0	41.2	58.8		39.5	0	0	100		34.9	9.1	90.9	0	0	25.6	20.4	79.6		
Total %	0	0	0	0	0	0	16.3	23.3			0	0	34.9			2.3	23.3	0	0					

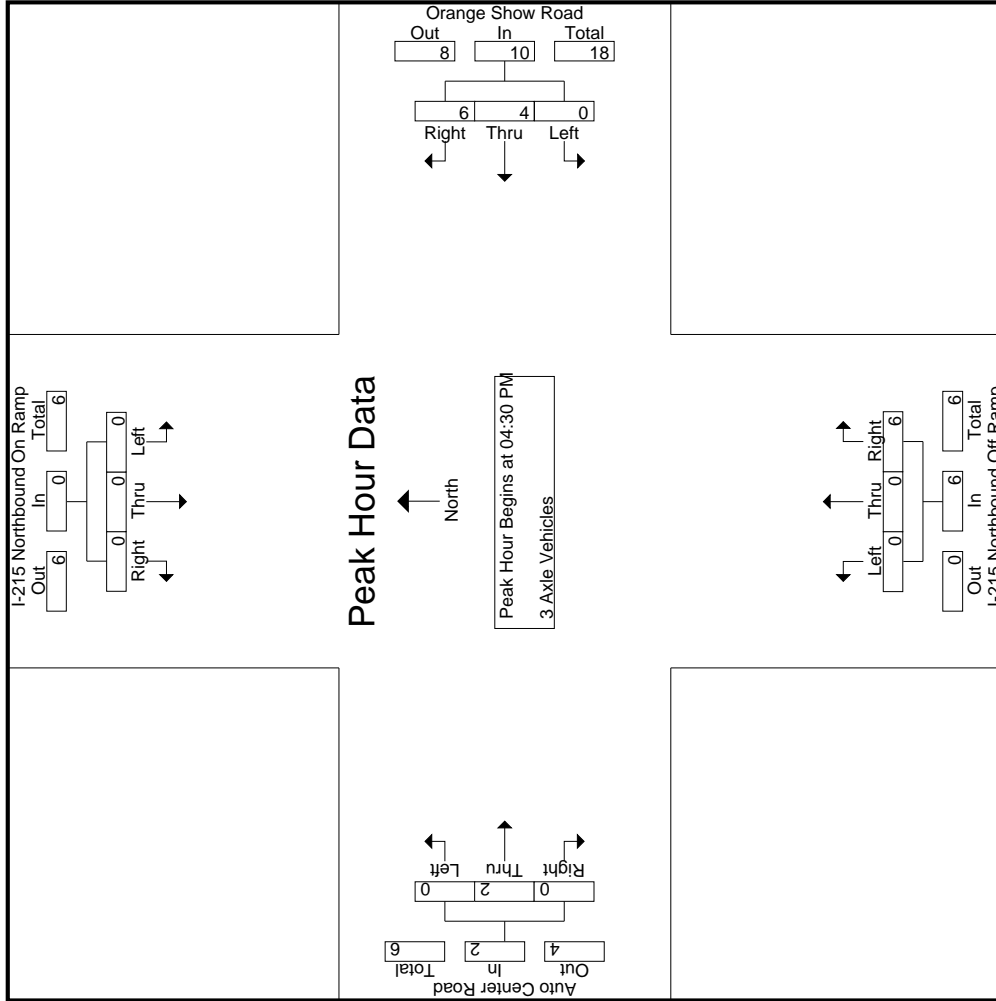
Start Time	I-215 Northbound On Ramp Southbound					Orange Show Road Westbound					I-215 Northbound Off Ramp Northbound					Auto Center Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	1	0	1	4
04:45 PM	0	0	0	0	0	0	0	2	4	4	0	0	3	0	3	0	3	0	0	0	0	0	7
05:00 PM	0	0	0	0	0	0	0	0	2	2	0	0	1	1	1	0	1	0	0	0	0	0	3
05:15 PM	0	0	0	0	0	0	0	2	0	2	0	0	1	1	1	0	1	0	0	1	0	1	4
Total Volume	0	0	0	0	0	0	0	4	6	6	0	0	6	6	6	0	6	0	0	2	0	2	18
% App. Total	0	0	0	0	0	0	0	40	60	60	0	0	100	0	100	0	100	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.500	.750	.625	.000	.000	.500	.000	.500	.000	.500	.000	.000	.500	.000	.500	.643

Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:30 PM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Road/Orange Show Road
 Weather: Clear

File Name : 02-SBC215NAUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Road/Orange Show Road
 Weather: Clear

File Name : 02-SBC215NAUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	I-215 Northbound On Ramp Southbound			Orange Show Road Westbound			I-215 Northbound Off Ramp Northbound			Auto Center Road Eastbound					
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total	
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1															
Peak Hour for Each Approach Begins at:															
	04:30 PM												04:30 PM		
+0 mins.	0	0	0	0	0	2	0	0	0	0	0	1	0	0	1
+15 mins.	0	0	0	2	2	4	0	0	0	0	0	3	0	0	0
+30 mins.	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0
+45 mins.	0	0	0	2	0	2	0	0	1	0	0	1	0	0	1
Total Volume	0	0	0	4	6	10	0	0	6	0	0	6	0	2	0
% App. Total	0	0	0	40	60	60	0	0	100	0	0	100	0	100	0
PHF	.000	.000	.000	.500	.750	.625	.000	.000	.500	.000	.000	.500	.000	.500	.500

Counts Unlimited
 PO Box 1178
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City of San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Road/Orange Show Road
 Weather: Clear

File Name : 02-SBC215NAUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 4+ Axle Trucks

Start Time	I-215 Northbound On Ramp Southbound					Orange Show Road Westbound					I-215 Northbound Off Ramp Northbound					Auto Center Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	4	1	0	5	0	0	3	1	3	0	2	0	0	2	1	10	11
04:15 PM	0	0	0	0	0	0	5	0	0	5	0	0	11	2	11	0	3	0	0	3	2	19	21
04:30 PM	0	0	0	0	0	0	0	1	0	1	2	0	2	0	4	0	1	0	0	1	0	6	6
04:45 PM	0	0	0	0	0	0	4	2	1	6	0	0	5	2	5	0	1	0	0	1	3	12	15
Total	0	0	0	0	0	13	4	4	1	17	2	0	21	5	23	0	7	0	0	7	6	47	53
05:00 PM	0	0	0	0	0	2	2	2	0	4	2	0	6	2	8	1	0	0	0	1	2	13	15
05:15 PM	0	0	0	0	0	1	0	0	0	1	0	0	6	2	6	0	2	0	0	2	2	9	11
05:30 PM	0	0	0	0	0	2	1	0	0	3	0	0	4	0	4	0	1	0	0	1	0	8	8
05:45 PM	0	0	0	0	0	6	2	2	2	8	0	0	4	0	4	0	3	0	0	3	2	15	17
Total	0	0	0	0	0	11	5	2	2	16	2	0	20	4	22	1	6	0	0	7	6	45	51
Grand Total	0	0	0	0	0	24	9	3	3	33	4	0	41	9	45	1	13	0	0	14	12	92	104
Approach %	0	0	0	0	0	72.7	27.3			35.9	8.9	0	91.1		48.9	7.1	92.9	0		15.2	11.5	88.5	
Total %	0	0	0	0	0	26.1	9.8				4.3	0	44.6			1.1	14.1	0					

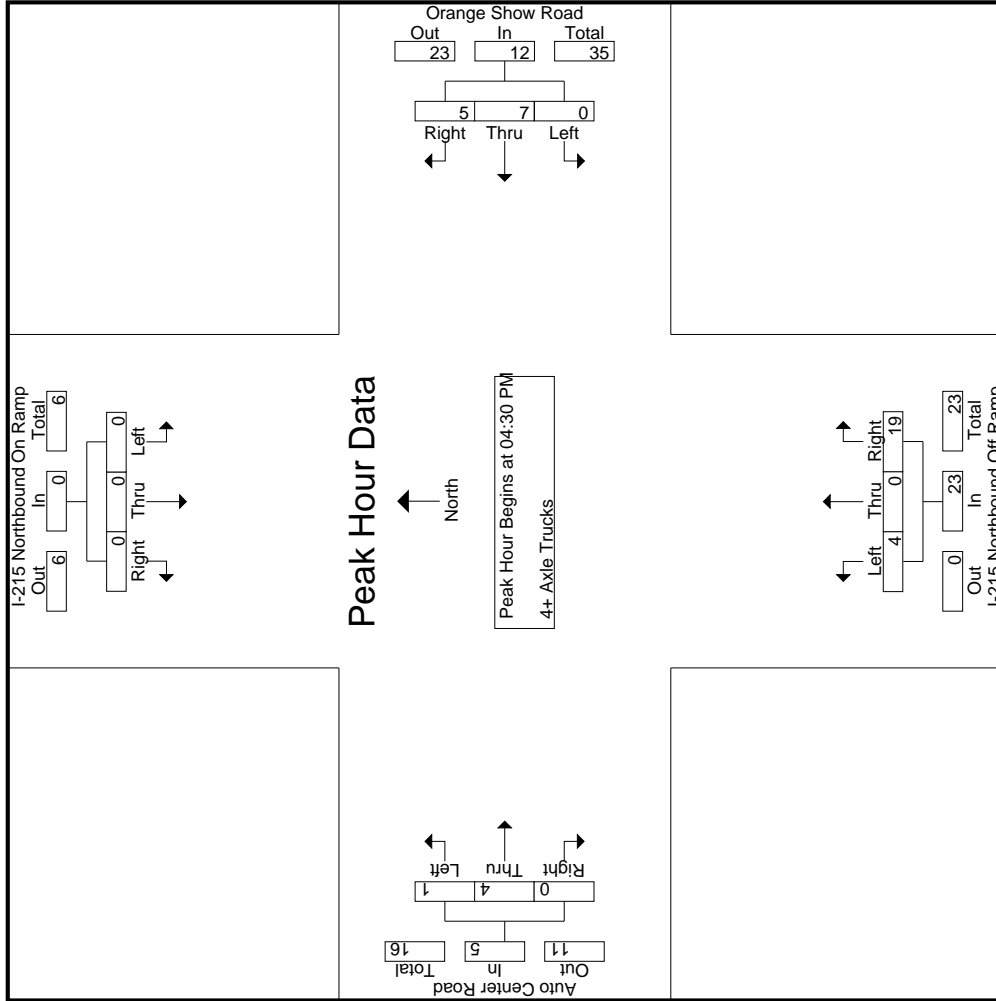
Start Time	I-215 Northbound On Ramp Southbound					Orange Show Road Westbound					I-215 Northbound Off Ramp Northbound					Auto Center Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:30 PM	0	0	0	0	0	0	0	0	0	0	2	0	2	0	2	0	1	0	0	1	0	1	6
04:45 PM	0	0	0	0	0	0	4	2	0	2	0	0	5	0	5	0	1	0	0	1	0	1	12
05:00 PM	0	0	0	0	0	0	2	2	0	2	2	0	6	0	6	1	0	0	0	1	0	1	13
05:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	2	0	0	2	0	2	9
Total Volume	0	0	0	0	0	0	7	7	0	5	4	0	19	0	19	1	4	0	0	4	0	5	40
% App. Total	0	0	0	0	0	58.3	41.7			41.7	17.4	0	82.6		82.6	20	80	0		80	0	0	
PHF	.000	.000	.000	.000	.000	.000	.438	.625	.500	.719	.500	.000	.792	.250	.500	.000	.625	.000		.625	.000	.769	

Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:30 PM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Road/Orange Show Road
 Weather: Clear

File Name : 02-SBC215NAUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Road/Orange Show Road
 Weather: Clear

File Name : 02-SBC215NAUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	I-215 Northbound On Ramp Southbound			Orange Show Road Westbound			I-215 Northbound Off Ramp Northbound			Auto Center Road Eastbound				
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	04:30 PM													
+0 mins.	0	0	0	0	0	1	1	0	2	0	0	1	0	1
+15 mins.	0	0	0	0	4	2	6	0	5	0	1	0	0	1
+30 mins.	0	0	0	0	2	2	4	2	6	1	0	0	0	1
+45 mins.	0	0	0	0	1	0	1	0	6	0	2	0	0	2
Total Volume	0	0	0	0	7	5	12	4	19	4	4	0	0	5
% App. Total	0	0	0	0	58.3	41.7	17.4	0	82.6	20	80	0	0	0
PHF	.000	.000	.000	.000	.438	.625	.500	.000	.792	.250	.500	.000	.000	.625

Location: San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Dr/Orange Show Rd



Date: 3/2/2017
 Day: Thursday

PEDESTRIANS

	North Leg I-215 Northbound Ramps	East Leg Orange Show Road	South Leg I-215 Northbound Ramps	West Leg Auto Center Road	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

	North Leg I-215 Northbound Ramps	East Leg Orange Show Road	South Leg I-215 Northbound Ramps	West Leg Auto Center Road	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	1	0	1
TOTAL VOLUMES:	0	0	1	0	1

Location: San Bernardino
 N/S: I-215 Northbound Ramps
 E/W: Auto Center Dr/Orange Show Rd



Date: 3/2/2017
 Day: Thursday

BICYCLES

	North Leg I-215 Northbound Ramps	East Leg Orange Show Road	South Leg I-215 Northbound Ramps	West Leg Auto Center Road	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	1	0	1
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	0	0	1	0	1

	North Leg I-215 Northbound Ramps	East Leg Orange Show Road	South Leg I-215 Northbound Ramps	West Leg Auto Center Road	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	1	0	1
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	0	1	0	1

Counts Unlimited, Inc.
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: E Street
 E/W: Orange Show Road
 Weather: Clear

File Name : 03-SBCESORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	E Street Southbound						Orange Show Road Westbound						E Street Northbound						Orange Show Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total		
	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total		
07:00 AM	10	8	3	3	21	81	11	61	9	6	81	18	12	9	5	39	15	209	76	34	300	48	441	489		
07:15 AM	9	30	10	6	49	88	17	61	10	9	88	25	23	21	9	69	36	272	117	62	425	86	631	717		
07:30 AM	10	20	6	4	36	92	10	71	11	6	92	30	25	20	7	75	44	261	104	43	409	60	612	672		
07:45 AM	15	42	8	4	65	90	14	60	16	10	90	34	49	24	7	107	65	295	142	71	502	92	764	856		
Total	44	100	27	17	171	351	52	253	46	31	351	107	109	74	28	290	160	1037	439	210	1636	286	2448	2734		
08:00 AM	7	23	12	5	42	120	10	101	9	6	120	23	32	11	5	66	63	311	82	45	456	61	684	745		
08:15 AM	14	21	12	5	47	115	15	90	10	4	115	26	21	12	6	59	41	190	85	41	316	56	537	593		
08:30 AM	14	19	11	7	44	119	12	97	10	6	119	19	32	13	9	64	49	185	93	30	327	52	554	606		
08:45 AM	20	30	20	12	70	104	24	63	17	11	104	42	30	12	2	84	66	188	120	29	374	54	632	686		
Total	55	93	55	29	203	458	61	351	46	27	458	110	115	48	22	273	219	874	380	145	1473	223	2407	2630		
Grand Total	99	193	82	46	374	809	113	604	92	58	809	217	224	122	50	563	379	1911	819	355	3109	509	4855	5364		
Approach %	26.5	51.6	21.9				14	74.7	11.4			38.5	39.8	21.7			12.2	61.5	26.3							
Total %	2	4	1.7		7.7	16.7	2.3	12.4	1.9		16.7	4.5	4.6	2.5		11.6	7.8	39.4	16.9		64	9.5	90.5			
% Passenger Vehicles	96	168	74		378	754	96	533	78		754	158	180	83		455	360	1802	756		3246	0	0	4833		
% Large 2 Axle Vehicles	97	87	90.2	87	90	87	85	88.2	84.8	81	87	72.8	80.4	68	68	74.2	95	94.3	92.3	92.4	93.7	0	0	90.1		
% 3 Axle Vehicles	2	11	3		18	55	12	38	4		55	54	31	29		120	18	58	45		131	0	0	324		
% 4+ Axle Trucks	2	5.7	3.7	4.3	4.3	10.6	6.3	4.3	1.7		6.3	24.9	13.8	23.8	12	19.6	4.7	3	5.5	2.8	3.8	0	0	6		
Total	1	13	4		22	37	4	13	10		37	1	12	9		31	1	8	14		37	0	0	127		
% 3 Axle Trucks	0	6.7	4.9	8.7	5.2	3.5	2.2	10.9	17.2		4.3	0.5	5.4	7.4	18	5.1	0.3	0.4	1.7	3.9	1.1	0	0	2.4		
% 4+ Axle Trucks	0	1	1		2	21	1	20	0		21	4	1	1		7	0	43	4		50	0	0	80		
Total	0	0.5	1.2	0	0.5	2.4	0.9	3.3	0	0	2.4	1.8	0.4	0.8	2	1.1	0	2.3	0.5	0.8	1.4	0	0	1.5		

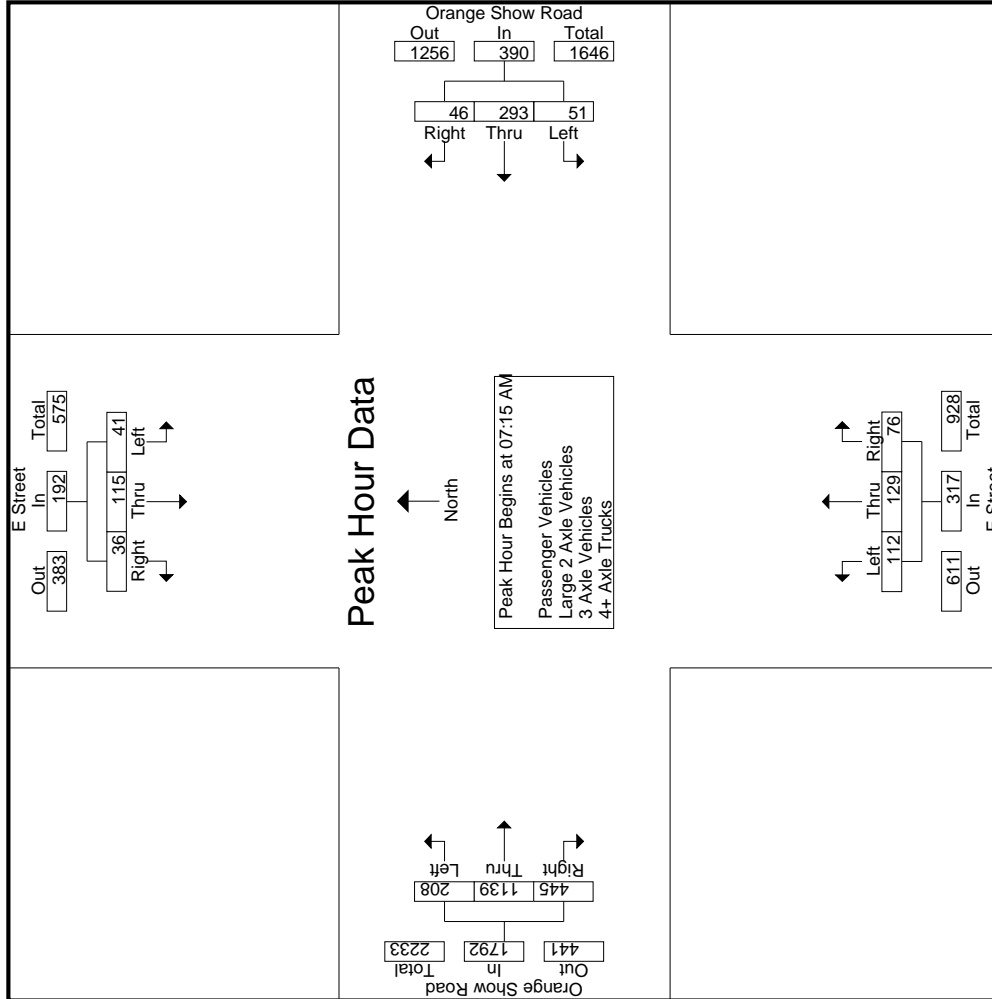
Start Time	E Street Southbound						Orange Show Road Westbound						E Street Northbound						Orange Show Road Eastbound					
	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total
	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total
07:15 AM	9	30	10	6	49	88	17	61	9	6	81	25	23	21	9	69	36	272	117	62	425	86	631	717
07:30 AM	10	20	6	4	36	92	10	71	11	6	92	30	25	20	7	75	44	261	104	43	409	60	612	672
07:45 AM	15	42	8	4	65	90	14	60	16	10	90	34	49	24	7	107	65	295	142	71	502	92	764	856
08:00 AM	7	23	12	5	42	120	10	101	9	6	120	23	32	11	5	66	63	311	82	45	456	61	684	745
Total Volume	41	115	36		192	390	51	293	46		390	112	129	76		317	208	1139	445		1792	2691		
% App. Total	21.4	59.9	18.8		11.8	11.8	13.1	75.1	11.8		11.8	35.3	40.7	24		24	11.6	63.6	24.8		24.8	28.8		
PHF	.683	.685	.750		.738	.738	.750	.725	.719		.813	.824	.658	.792		.741	.800	.916	.783		.892	.881		

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:15 AM

Counts Unlimited, Inc.
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: E Street
 E/W: Orange Show Road
 Weather: Clear

File Name : 03-SBCESORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



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 PO Box 1178
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City of San Bernardino
 N/S: E Street
 E/W: Orange Show Road
 Weather: Clear

File Name : 03-SBCESORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	E Street Southbound				Orange Show Road Westbound				E Street Northbound				Orange Show Road Eastbound			
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																
Peak Hour for Each Approach Begins at:																
	08:00 AM				08:00 AM				07:15 AM				07:15 AM			
+0 mins.	7	23	12	42	10	101	9	120	25	23	21	69	36	272	117	425
+15 mins.	14	21	12	47	15	90	10	115	30	25	20	75	44	261	104	409
+30 mins.	14	19	11	44	12	97	10	119	34	49	24	107	65	295	142	502
+45 mins.	20	30	20	70	24	63	17	104	23	32	11	66	63	311	82	456
Total Volume	55	93	55	203	61	351	46	458	112	129	76	317	208	1139	445	1792
% App. Total	27.1	45.8	27.1		13.3	76.6	10		35.3	40.7	24		11.6	63.6	24.8	
PHF	.688	.775	.688	.725	.635	.869	.676	.954	.824	.658	.792	.741	.800	.916	.783	.892

Counts Unlimited, Inc.
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City of San Bernardino
 N/S: E Street
 E/W: Orange Show Road
 Weather: Clear

File Name : 03-SBCESORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles

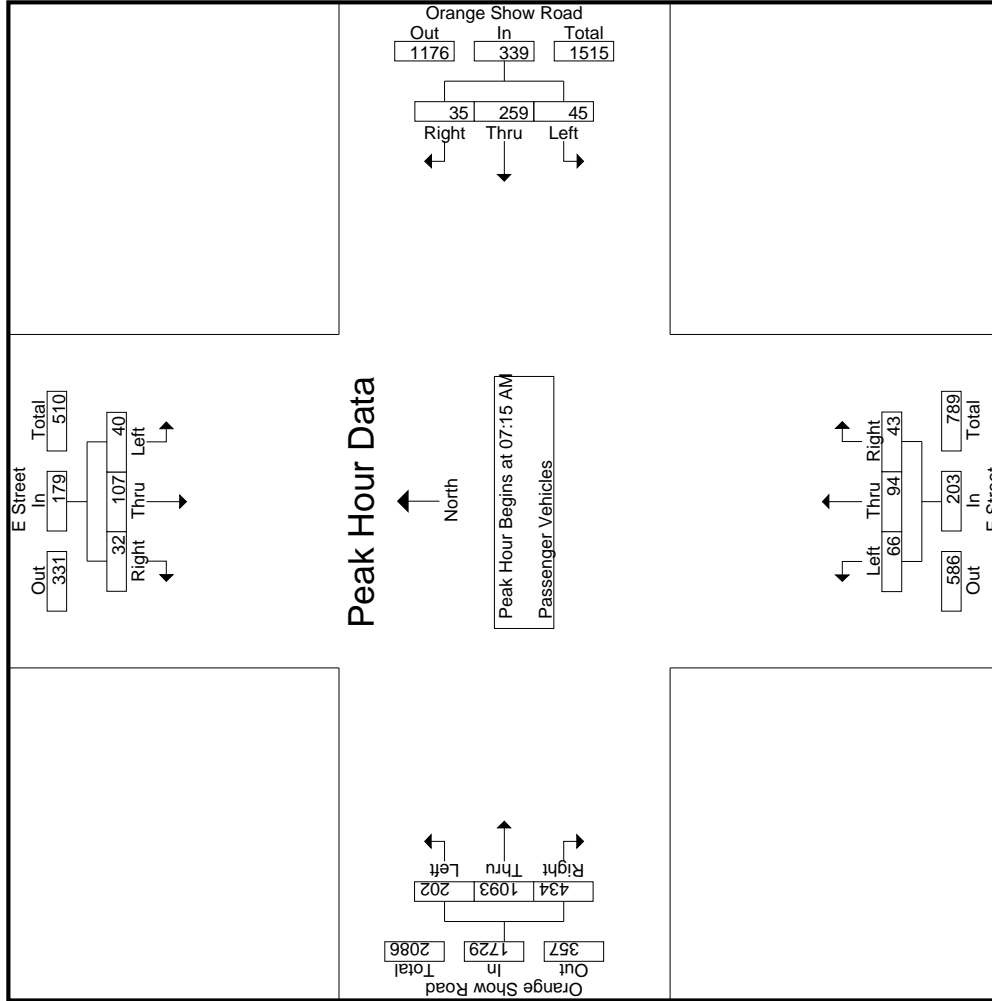
Start Time	E Street Southbound						Orange Show Road Westbound						E Street Northbound						Orange Show Road Eastbound					
	Left	Thru	Right	RTOR	App. Total	Int. Total	Left	Thru	Right	RTOR	App. Total	Int. Total	Left	Thru	Right	RTOR	App. Total	Int. Total	Left	Thru	Right	RTOR	App. Total	Int. Total
	07:00 AM	8	6	1	1	15		10	51	9	6	70		12	8	7	4	27		15	202	74	33	291
07:15 AM	9	28	8	4	45		17	54	4	3	75		17	20	14	5	51		36	262	115	60	413	
07:30 AM	9	19	6	4	34		10	62	9	6	81		19	17	6	2	42		43	248	101	40	392	
07:45 AM	15	39	8	4	62		9	50	14	8	73		28	28	13	5	60		63	290	140	69	493	
Total	41	92	23	13	156		46	217	36	23	299		67	73	40	16	180		157	1002	430	202	1589	
08:00 AM	7	21	10	4	38		9	93	8	5	110		11	29	10	4	50		60	293	78	43	431	
08:15 AM	14	17	11	5	42		15	81	10	4	106		22	19	11	6	52		41	177	81	37	299	
08:30 AM	14	16	10	6	40		11	86	8	5	105		18	30	10	6	58		45	169	79	26	293	
08:45 AM	20	22	20	12	62		15	56	16	10	87		40	29	12	2	81		57	161	88	20	306	
Total	55	76	51	27	182		50	316	42	24	408		91	107	43	18	241		203	800	326	126	1329	
Grand Total	96	168	74	40	338		96	533	78	47	707		158	180	83	34	421		360	1802	756	328	2918	
Approach %	28.4	49.7	21.9				13.6	75.4	11		16.1		37.5	42.8	19.7		9.6		12.3	61.8	25.9		66.6	
Total %	2.2	3.8	1.7		7.7		2.2	12.2	1.8				3.6	4.1	1.9				8.2	41.1	17.2			

Start Time	E Street Southbound						Orange Show Road Westbound						E Street Northbound						Orange Show Road Eastbound					
	Left	Thru	Right	RTOR	App. Total	Int. Total	Left	Thru	Right	RTOR	App. Total	Int. Total	Left	Thru	Right	RTOR	App. Total	Int. Total	Left	Thru	Right	RTOR	App. Total	Int. Total
	07:15 AM	9	28	8		45		17	54	4		75		17	20	14		51		36	262	115		413
07:30 AM	9	19	6		34		10	62	9		81		19	17	6		42		43	248	101		392	
07:45 AM	15	39	8		62		9	50	14		73		19	28	13		60		63	290	140		493	
08:00 AM	7	21	10		38		9	93	8		110		11	29	10		50		60	293	78		431	
Total Volume	40	107	32		179		45	259	35		339		66	94	43		203		202	1093	434		1729	
% App. Total	22.3	59.8	17.9				13.3	76.4	10.3		16.1		32.5	46.3	21.2		9.6		11.7	63.2	25.1		66.6	
PHF	.667	.666	.800		.722		.662	.696	.625		.770		.868	.810	.768		.846		.802	.933	.775		.877	

Counts Unlimited, Inc.
 PO Box 1178
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 (951) 268-6268

City of San Bernardino
 N/S: E Street
 E/W: Orange Show Road
 Weather: Clear

File Name : 03-SBCESORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



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City of San Bernardino
 N/S: E Street
 E/W: Orange Show Road
 Weather: Clear

File Name : 03-SBCESORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	E Street Southbound				Orange Show Road Westbound				E Street Northbound				Orange Show Road Eastbound			
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																
Peak Hour for Each Approach Begins at:																
	07:15 AM				07:15 AM				07:15 AM				07:15 AM			
+0 mins.	9	28	8	45	17	54	4	75	17	20	14	51	36	262	115	413
+15 mins.	9	19	6	34	10	62	9	81	19	17	6	42	43	248	101	392
+30 mins.	15	39	8	62	9	50	14	73	19	28	13	60	63	290	140	493
+45 mins.	7	21	10	38	9	93	8	110	11	29	10	50	60	293	78	431
Total Volume	40	107	32	179	45	259	35	339	66	94	43	203	202	1093	434	1729
% App. Total	22.3	59.8	17.9		13.3	76.4	10.3		32.5	46.3	21.2		11.7	63.2	25.1	
PHF	.667	.686	.800	.722	.662	.696	.625	.770	.868	.810	.768	.846	.802	.933	.775	.877

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City of San Bernardino
 N/S: E Street
 E/W: Orange Show Road
 Weather: Clear

File Name : 03-SBCESORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Large 2 Axle Vehicles

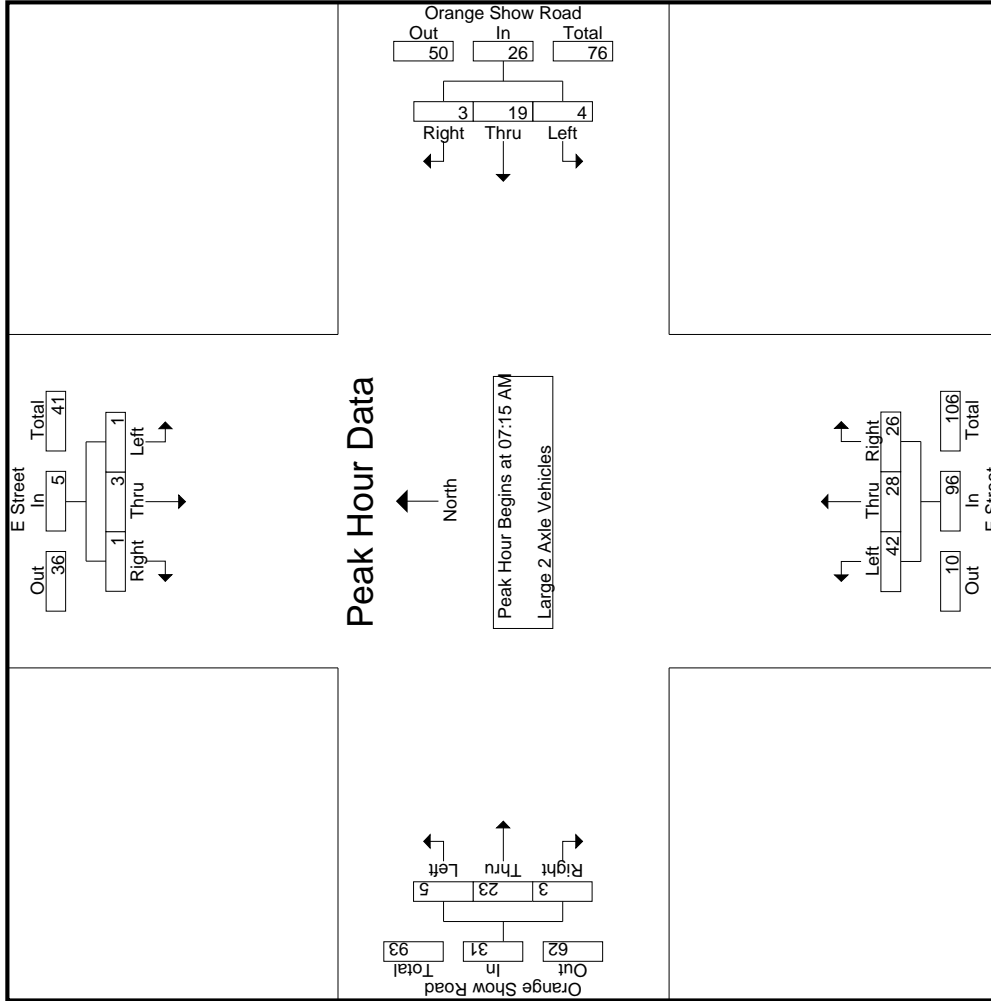
Start Time	E Street Southbound						Orange Show Road Westbound						E Street Northbound						Orange Show Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total		
	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total		
07:00 AM	1	0	0	0	1	0	7	0	0	0	7	0	2	2	1	1	9	0	4	4	0	0	4	1	21	22
07:15 AM	0	1	0	0	1	0	3	0	0	0	3	0	7	2	4	1	13	2	4	4	1	1	5	2	22	24
07:30 AM	1	0	0	0	1	0	4	2	0	6	11	5	12	3	28	0	43	3	7	7	0	0	7	3	42	45
07:45 AM	0	1	0	0	1	0	7	1	1	11	13	20	10	1	43	2	58	2	1	0	0	0	3	2	58	60
Total	2	2	0	0	4	0	21	3	1	27	36	29	28	6	93	2	143	8	16	1	1	1	19	8	143	151
08:00 AM	0	1	1	1	2	0	5	0	0	6	11	1	0	0	12	0	16	1	3	11	2	0	16	1	36	37
08:15 AM	0	2	1	0	3	0	4	0	0	4	4	1	1	0	6	0	8	3	0	5	3	3	8	3	21	24
08:30 AM	0	2	1	1	3	0	5	1	0	7	1	0	0	0	1	1	23	2	4	8	11	1	23	2	34	36
08:45 AM	0	4	0	0	4	0	3	0	0	10	2	0	0	0	2	0	55	5	9	18	28	5	55	5	71	76
Total	0	9	3	2	12	0	17	1	0	27	18	2	1	0	21	0	102	11	16	42	44	9	102	11	162	173
Grand Total	2	11	3	2	16	0	38	4	1	54	54	31	29	6	114	18	305	19	58	58	45	10	121	19	305	324
Approach %	12.5	68.8	18.8				22.2	70.4	7.4	17.7	47.4	27.2	25.4	37.4	37.2	14.9	47.9	37.2	5.9	19	14.8		39.7	5.9	94.1	
Total %	0.7	3.6	1				3.9	12.5	1.3	17.7	17.7	10.2	9.5			5.9	19	14.8								

Start Time	E Street Southbound						Orange Show Road Westbound						E Street Northbound						Orange Show Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total		
	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total		
07:15 AM	0	1	0	0	1	0	3	0	0	3	7	2	2	4	4	1	13	2	4	4	1	1	5	1	5	5
07:30 AM	1	0	0	0	1	0	4	0	0	4	11	5	5	12	10	0	28	0	4	7	0	0	7	0	7	7
07:45 AM	0	1	0	0	1	0	7	1	1	9	13	20	10	1	43	2	58	3	2	11	1	0	16	0	3	3
08:00 AM	0	1	1	1	2	0	5	0	0	6	11	1	0	0	12	0	16	1	3	11	2	0	16	2	16	16
Total Volume	1	3	1	1	5	0	19	3	3	26	42	28	26	0	96	5	158	3	23	23	3	3	31	3	31	158
% App. Total	20	60	20				73.1	11.5		15.4	43.8	29.2	27.1	16.1	74.2	9.7			16.1	74.2	9.7					
PHF	.250	.750	.250				.679	.375		.591	.808	.350	.542	.417	.523	.375	.484	.681	.417	.523	.375				.484	.681

Counts Unlimited, Inc.
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 (951) 268-6268

City of San Bernardino
 N/S: E Street
 E/W: Orange Show Road
 Weather: Clear

File Name : 03-SBCESORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



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City of San Bernardino
 N/S: E Street
 E/W: Orange Show Road
 Weather: Clear

File Name : 03-SBCESORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	E Street Southbound			Orange Show Road Westbound			E Street Northbound			Orange Show Road Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	07:15 AM			07:15 AM			07:15 AM			07:15 AM				
+0 mins.	0	1	0	0	3	0	3	0	2	4	0	4	1	5
+15 mins.	1	0	0	0	4	2	6	11	5	12	0	7	0	7
+30 mins.	0	1	0	3	7	1	11	13	20	10	2	1	0	3
+45 mins.	0	1	1	1	5	0	6	11	1	0	3	11	2	16
Total Volume	1	3	1	4	19	3	26	42	28	26	5	23	3	31
% App. Total	20	60	20	15.4	73.1	11.5	43.8	29.2	27.1	16.1	74.2	9.7		
PHF	.250	.750	.250	.333	.679	.375	.591	.808	.350	.542	.417	.523	.375	.484

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City of San Bernardino
 N/S: E Street
 E/W: Orange Show Road
 Weather: Clear

File Name : 03-SBCESORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 3 Axle Vehicles

Start Time	E Street Southbound						Orange Show Road Westbound						E Street Northbound						Orange Show Road Eastbound					
	Left	Thru	Right	RTOR	App. Total	Int. Total	Left	Thru	Right	RTOR	App. Total	Int. Total	Left	Thru	Right	RTOR	App. Total	Int. Total	Left	Thru	Right	RTOR	App. Total	Int. Total
	07:00 AM	1	2	2	2	5		1	1	0	0	2		1	1	0	0	2		0	1	1	1	2
07:15 AM	0	1	2	2	3		0	2	6	6	8		0	1	3	3	4		0	2	1	1	3	
07:30 AM	0	1	0	0	1		0	4	0	0	4		0	3	2	2	5		1	0	3	3	4	
07:45 AM	0	2	0	0	2		1	1	1	1	3		1	1	1	1	4		2	0	2	2	4	
Total	1	6	4	4	11		2	8	7	7	17		1	6	6	6	13		1	4	7	7	12	
08:00 AM	0	1	0	0	1		0	2	1	1	3		0	2	1	1	3		0	1	2	2	3	
08:15 AM	0	2	0	0	2		0	0	0	0	0		0	1	0	0	1		0	0	0	0	0	
08:30 AM	0	1	0	0	1		0	3	1	1	4		0	2	2	2	4		0	1	3	3	4	
08:45 AM	0	3	0	0	3		2	0	1	1	3		0	1	0	0	1		0	2	2	2	4	
Total	0	7	0	0	7		2	5	3	3	10		0	6	3	3	9		0	4	7	7	11	
Grand Total	1	13	4	4	18		4	13	10	10	27		1	12	9	9	22		1	8	14	14	23	
Approach %	5.6	72.2	22.2		14.8		4.4	48.1	37		30		4.5	54.5	40.9		24.4		4.3	34.8	60.9		25.6	
Total %	1.1	14.4	4.4		4.4		1.1	14.4	11.1		10		1.1	13.3	10		10		1.1	8.9	15.6		15.6	

Start Time	E Street Southbound						Orange Show Road Westbound						E Street Northbound						Orange Show Road Eastbound					
	Left	Thru	Right	RTOR	App. Total	Int. Total	Left	Thru	Right	RTOR	App. Total	Int. Total	Left	Thru	Right	RTOR	App. Total	Int. Total	Left	Thru	Right	RTOR	App. Total	Int. Total
	07:15 AM	0	1	2	3	3		0	2	6	6	8		0	1	3	3	4		0	2	1	1	3
07:30 AM	0	1	0	0	1		0	4	0	0	4		0	3	2	2	5		0	0	3	3	4	
07:45 AM	0	2	0	0	2		1	1	1	1	3		0	1	1	1	2		1	0	2	2	3	
08:00 AM	0	1	0	0	1		0	2	1	1	3		0	2	2	2	4		0	1	3	3	4	
Total Volume	0	5	2	2	7		1	9	8	8	18		0	7	7	7	14		1	4	8	8	13	
% App. Total	0	71.4	28.6		28.6		5.6	50	44.4		44.4		0	50	50		50		7.7	30.8	61.5		61.5	
PHF	.000	.625	.250		.583		.250	.563	.333		.563		.000	.583	.583		.583		.250	.500	.667		.667	

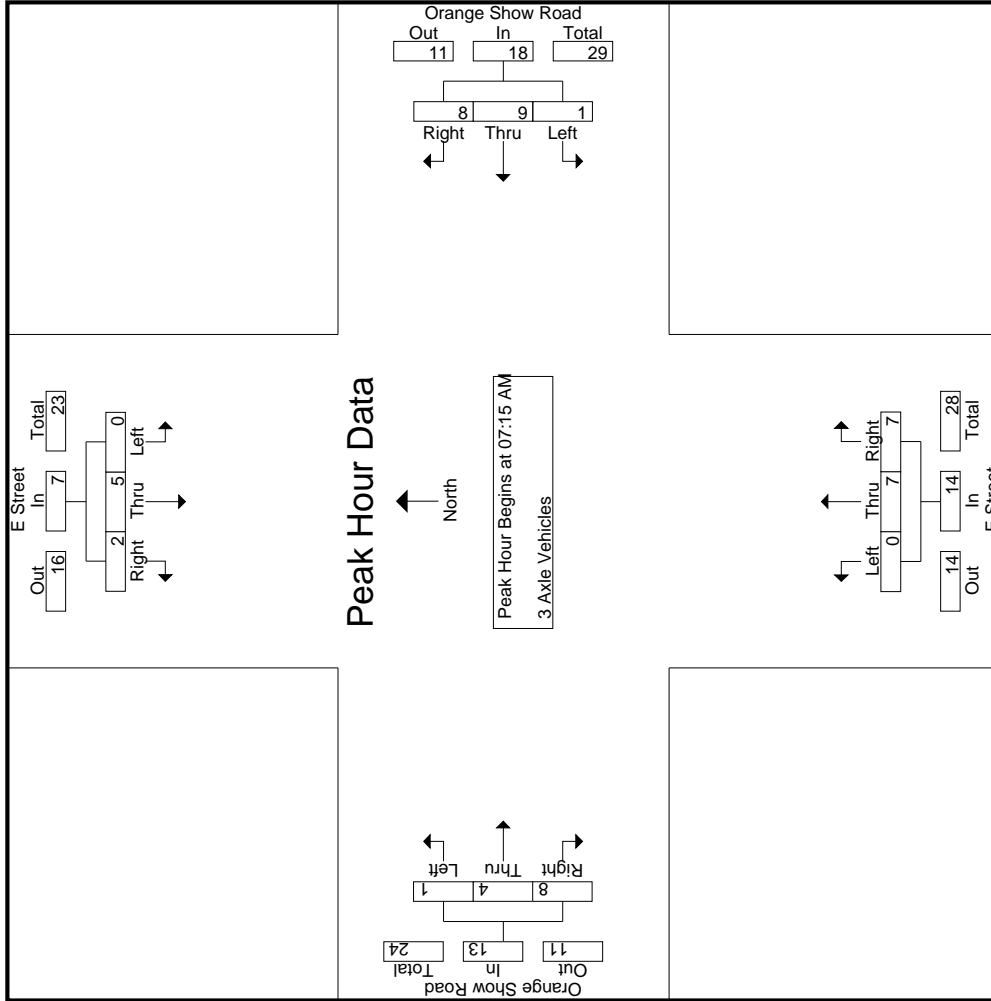
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:15 AM

Start Time	E Street Southbound						Orange Show Road Westbound						E Street Northbound						Orange Show Road Eastbound					
	Left	Thru	Right	RTOR	App. Total	Int. Total	Left	Thru	Right	RTOR	App. Total	Int. Total	Left	Thru	Right	RTOR	App. Total	Int. Total	Left	Thru	Right	RTOR	App. Total	Int. Total
07:15 AM	0	1	2	3	3		0	2	6	6	8		0	1	3	3	4		0	2	1	1	3	
07:30 AM	0	1	0	0	1		0	4	0	0	4		0	3	2	2	5		0	0	3	3	4	
07:45 AM	0	2	0	0	2		1	1	1	1	3		0	1	1	1	2		1	0	2	2	3	
08:00 AM	0	1	0	0	1		0	2	1	1	3		0	2	2	2	4		0	1	3	3	4	
Total Volume	0	5	2	2	7		1	9	8	8	18		0	7	7	7	14		1	4	8	8	13	
% App. Total	0	71.4	28.6		28.6		5.6	50	44.4		44.4		0	50	50		50		7.7	30.8	61.5		61.5	
PHF	.000	.625	.250		.583		.250	.563	.333		.563		.000	.583	.583		.583		.250	.500	.667		.667	

Counts Unlimited, Inc.
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City of San Bernardino
 N/S: E Street
 E/W: Orange Show Road
 Weather: Clear

File Name : 03-SBCESORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



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City of San Bernardino
 N/S: E Street
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File Name : 03-SBCESORAM
 Site Code : 05117141
 Start Date : 3/2/2017
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Start Time	E Street Southbound			Orange Show Road Westbound			E Street Northbound			Orange Show Road Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	07:15 AM			07:15 AM			07:15 AM			07:15 AM				
+0 mins.	0	1	2	3	0	2	6	8	0	0	1	3	4	3
+15 mins.	0	1	0	1	0	4	0	4	0	3	2	5	0	4
+30 mins.	0	2	0	2	1	1	1	3	0	1	1	2	0	3
+45 mins.	0	1	0	1	0	2	1	3	0	2	1	3	0	3
Total Volume	0	5	2	7	1	9	8	18	0	7	7	14	1	13
% App. Total	0	71.4	28.6	.583	5.6	50	44.4	.250	.250	.563	.333	.563	.700	.813
PHF	.000	.625	.250	.583	.250	.563	.333	.563	.250	.563	.333	.563	.700	.813

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City of San Bernardino
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 E/W: Orange Show Road
 Weather: Clear

File Name : 03-SBCESORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 4+ Axle Trucks

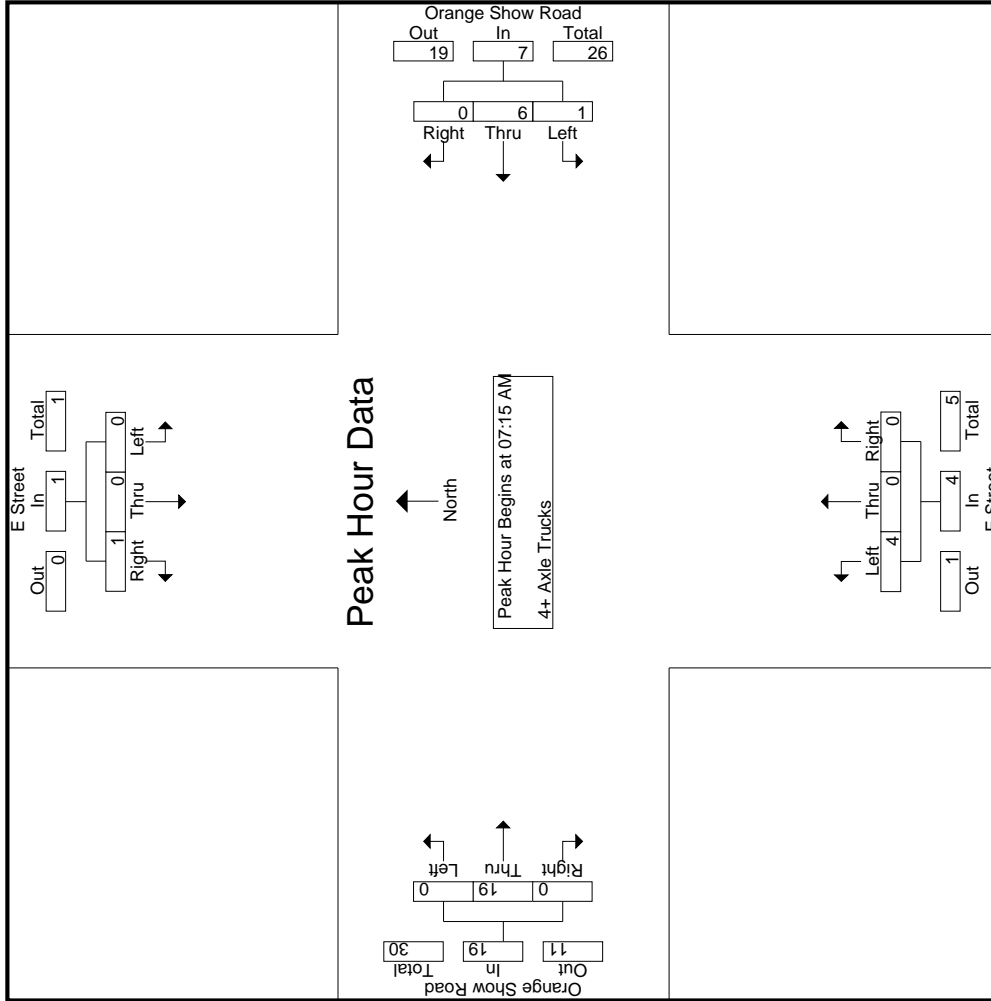
Start Time	E Street Southbound				Orange Show Road Westbound				E Street Northbound				Orange Show Road Eastbound				Exclu. Total	Inclu. Total	Int. Total			
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left				Thru	Right	RTOR
07:00 AM	0	0	0	0	0	0	2	0	0	2	0	1	0	0	1	0	2	1	0	3	0	6
07:15 AM	0	0	0	0	0	0	2	0	0	2	0	1	0	0	1	0	4	0	0	4	0	7
07:30 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	6	0	0	6	0	7
07:45 AM	0	0	0	0	0	1	2	0	0	3	0	2	0	0	2	0	3	0	0	3	0	8
Total	0	0	0	0	0	1	7	0	0	8	3	1	0	0	4	0	15	1	0	16	0	28
08:00 AM	0	0	1	0	1	0	1	0	0	1	1	0	0	0	1	0	6	0	0	6	0	9
08:15 AM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	8	1	1	9	1	14
08:30 AM	0	0	0	0	0	0	3	0	0	3	0	1	1	0	1	0	7	0	0	7	1	11
08:45 AM	0	1	0	0	1	0	4	0	0	4	0	0	0	0	0	0	7	2	2	9	2	14
Total	0	1	1	0	2	0	13	0	0	13	1	0	1	1	2	0	28	3	3	31	4	48
Grand Total	0	1	1	0	2	1	20	0	0	21	4	1	1	1	6	0	43	4	3	47	4	76
Approch %	0	50	50		2.6	4.8	95.2	0		27.6	66.7	16.7	16.7		7.9	0	91.5	8.5		61.8	5	95
Total %	0	1.3	1.3			1.3	26.3	0			5.3	1.3	1.3			0	56.6	5.3				

Start Time	E Street Southbound				Orange Show Road Westbound				E Street Northbound				Orange Show Road Eastbound				Exclu. Total	Inclu. Total	Int. Total			
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left				Thru	Right	RTOR
07:15 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	4
07:30 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	6
07:45 AM	0	0	0	0	0	1	2	0	0	3	0	0	0	0	0	0	2	0	0	2	0	3
08:00 AM	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	6
Total Volume	0	0	1		1	1	6	0		7	4	0	0	0	4	0	19	0		19	0	31
% App. Total	0	0	100		.250	14.3	85.7	0		0	100	0	0	0	0	0	100	0		0	0	100
PHF	.000	.000	.250		.250	.250	.750	.000		.583	.500	.000	.000	.000	.500	.000	.792	.000		.792	.000	.861

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City of San Bernardino
 N/S: E Street
 E/W: Orange Show Road
 Weather: Clear

File Name : 03-SBCESORAM
 Site Code : 05117141
 Start Date : 3/2/2017
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File Name : 03-SBCESORAM
 Site Code : 05117141
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City of San Bernardino
 N/S: E Street
 E/W: Orange Show Road
 Weather: Clear

Start Time	E Street Southbound			Orange Show Road Westbound			E Street Northbound			Orange Show Road Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	07:15 AM			07:15 AM			07:15 AM			07:15 AM				
+0 mins.	0	0	0	0	0	0	2	0	0	1	0	0	4	0
+15 mins.	0	0	0	0	0	0	1	0	0	0	0	0	6	0
+30 mins.	0	0	0	0	1	0	3	0	0	2	0	0	3	0
+45 mins.	0	0	1	0	0	0	1	0	0	1	0	0	6	0
Total Volume	0	0	1	1	6	0	7	0	0	4	0	0	19	0
% App. Total	0	0	100	14.3	85.7	0	100	0	0	0	0	0	100	0
PHF	.000	.000	.250	.250	.750	.000	.583	.000	.000	.500	.000	.000	.792	.000

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 Site Code : 05117141
 Start Date : 3/2/2017
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Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	E Street Southbound						Orange Show Road Westbound						E Street Northbound						Orange Show Road Eastbound						
	Left	Thru	Right	RTOR	App. Total	Int. Total	Left	Thru	Right	RTOR	App. Total	Int. Total	Left	Thru	Right	RTOR	App. Total	Int. Total	Left	Thru	Right	RTOR	App. Total	Int. Total	
	04:00 PM	49	70	58	32	177	277	36	209	32	11	277	77	77	32	12	186	62	217	87	31	366	86	1006	1092
04:15 PM	48	85	53	30	186	226	26	175	25	9	226	80	80	27	5	187	57	239	91	34	387	78	986	1064	
04:30 PM	39	54	61	20	154	284	40	214	30	17	284	68	50	42	17	160	58	238	90	37	386	91	984	1075	
04:45 PM	42	73	53	21	168	223	37	167	19	8	223	85	79	31	7	195	63	231	89	46	383	82	969	1051	
Total	178	282	225	103	685	1010	139	765	106	45	1010	310	286	132	41	728	240	925	357	148	1522	337	3945	4282	
05:00 PM	68	47	71	24	186	303	44	233	26	13	303	67	99	42	7	208	44	260	73	37	377	81	1074	1155	
05:15 PM	62	72	51	27	185	262	37	192	33	19	262	75	102	41	9	218	65	235	90	51	390	106	1055	1161	
05:30 PM	45	56	69	31	170	246	24	187	35	19	246	77	82	21	7	180	53	285	76	35	414	92	1010	1102	
05:45 PM	38	57	46	23	141	223	28	169	26	12	223	68	84	19	4	171	63	265	80	32	408	71	943	1014	
Total	213	232	237	105	682	1034	133	781	120	63	1034	287	367	123	27	777	225	1045	319	155	1589	350	4082	4432	
Grand Total	391	514	462	208	1367	2044	272	1546	226	108	2044	597	653	255	68	1505	465	1970	676	303	3111	687	8027	8714	
Approach %	28.6	37.6	33.8				13.3	75.6	11.1			39.7	43.4	16.9			14.9	63.3	21.7				7.9	92.1	
Total %	4.9	6.4	5.8		17	25.5	3.4	19.3	2.8		25.5	7.4	8.1	3.2		18.7	5.8	24.5	8.4			38.8	7.9	92.1	
Passenger Vehicles	386	494	452		1534	2029	261	1465	209		2029	593	637	243		1532	440	1837	635			3205	0	0	8300
% Passenger Vehicles	98.7	96.1	97.8		97.4	94.3	96	94.8	92.5		94.3	99.3	97.5	95.3		97.4	94.6	93.2	93.9			96.7	0	0	95.2
Large 2 Axle Vehicles	5	9	5		21	47	10	34	3		47	2	5	4		13	25	56	37			124	0	0	205
% Large 2 Axle Vehicles	1.3	1.8	1.1		1.3	2.2	3.7	2.2	1.3		2.2	0.3	0.8	1.6		2.9	5.4	2.8	5.5			3.6	0	0	2.4
3 Axle Vehicles	0	11	3		17	43	1	14	14		43	0	11	8		26	0	26	4			34	0	0	120
% 3 Axle Vehicles	0	2.1	0.6		1.4	2.1	0.4	0.9	6.2		2.1	0	1.7	3.1		10.3	0	1.3	0.6			1.3	0	0	1.4
4+ Axle Trucks	0	0	2		3	33	0	33	0		33	2	0	0		2	0	51	0			51	0	0	89
% 4+ Axle Trucks	0	0	0.4		0.5	0.2	0	2.1	0		1.5	0.3	0	0		0.1	0	2.6	0			1.5	0	0	1

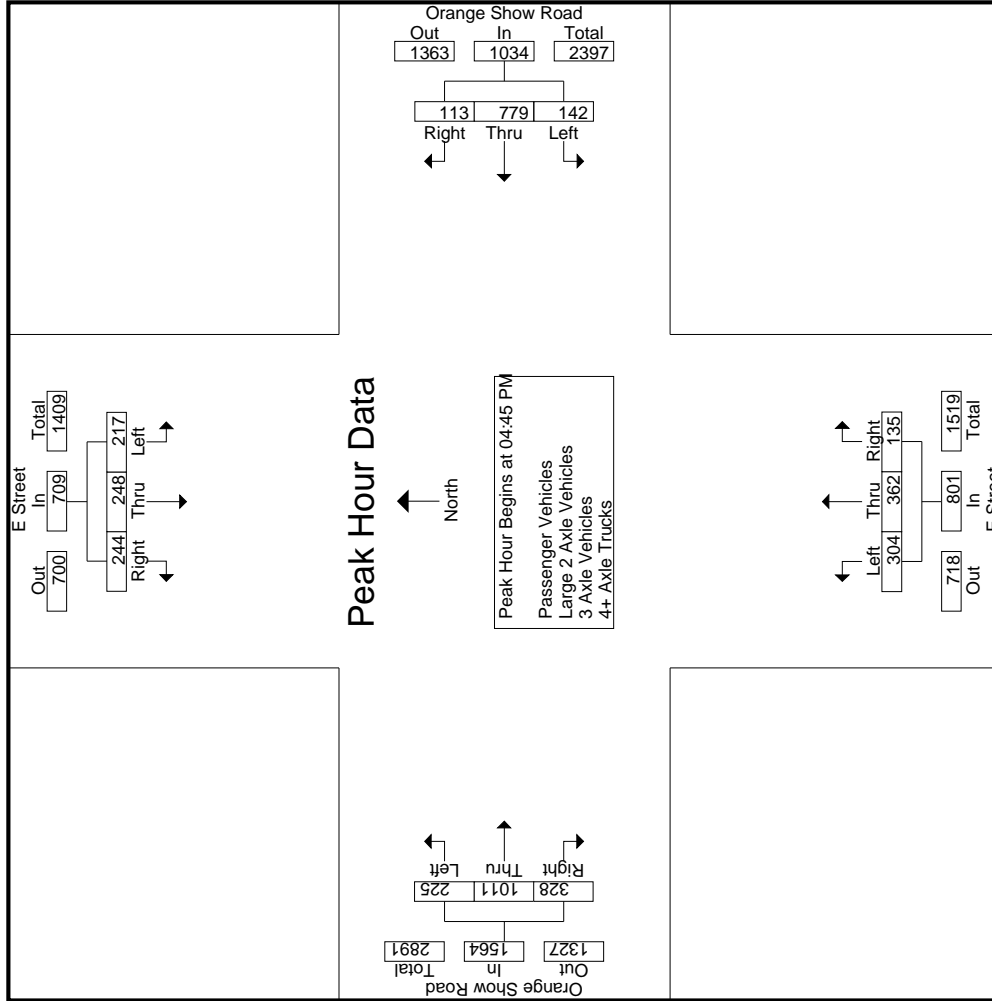
Start Time	E Street Southbound						Orange Show Road Westbound						E Street Northbound						Orange Show Road Eastbound					
	Left	Thru	Right	RTOR	App. Total	Int. Total	Left	Thru	Right	RTOR	App. Total	Int. Total	Left	Thru	Right	RTOR	App. Total	Int. Total	Left	Thru	Right	RTOR	App. Total	Int. Total
	04:45 PM	42	73	53		168		37	167	19		19	223	85	79	31		63	231	89			383	969
05:00 PM	68	47	71		186		44	233	26		26	303	67	99	42		44	260	73			377	1074	
05:15 PM	62	72	51		185		37	192	33		33	262	75	102	41		65	235	90			390	1055	
05:30 PM	45	56	69		170		24	187	35		35	246	77	82	21		53	285	76			414	1010	
Total Volume	217	248	244		709		142	779	113		113	1034	304	362	135		225	1011	328			1564	4108	
% App. Total	30.6	35	34.4		34.4		13.7	75.3	10.9		10.9	85.3	89.4	88.7	80.4		14.4	64.6	21			94.4	95.6	
PHF	.798	.849	.859		.859		.807	.836	.807		.807	.853	.894	.887	.804		.865	.887	.911			.944	.956	

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:45 PM

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Start Time	E Street Southbound				Orange Show Road Westbound				E Street Northbound				Orange Show Road Eastbound			
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																
Peak Hour for Each Approach Begins at:																
	04:45 PM				04:30 PM				04:45 PM				05:00 PM			
+0 mins.	42	73	53	168	40	214	30	284	85	79	31	195	44	260	73	377
+15 mins.	68	47	71	186	37	167	19	223	67	99	42	208	65	235	90	390
+30 mins.	62	72	51	185	44	233	26	303	75	102	41	218	53	285	76	414
+45 mins.	45	56	69	170	37	192	33	262	77	82	21	180	63	265	80	408
Total Volume	217	248	244	709	158	806	108	1072	304	362	135	801	225	1045	319	1589
% App. Total	30.6	35	34.4	.953	14.7	75.2	10.1	.884	38	45.2	16.9	.919	14.2	65.8	20.1	.960
PHF	.798	.849	.859		.898	.865	.818		.894	.887	.804		.865	.917	.886	

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Groups Printed- Passenger Vehicles

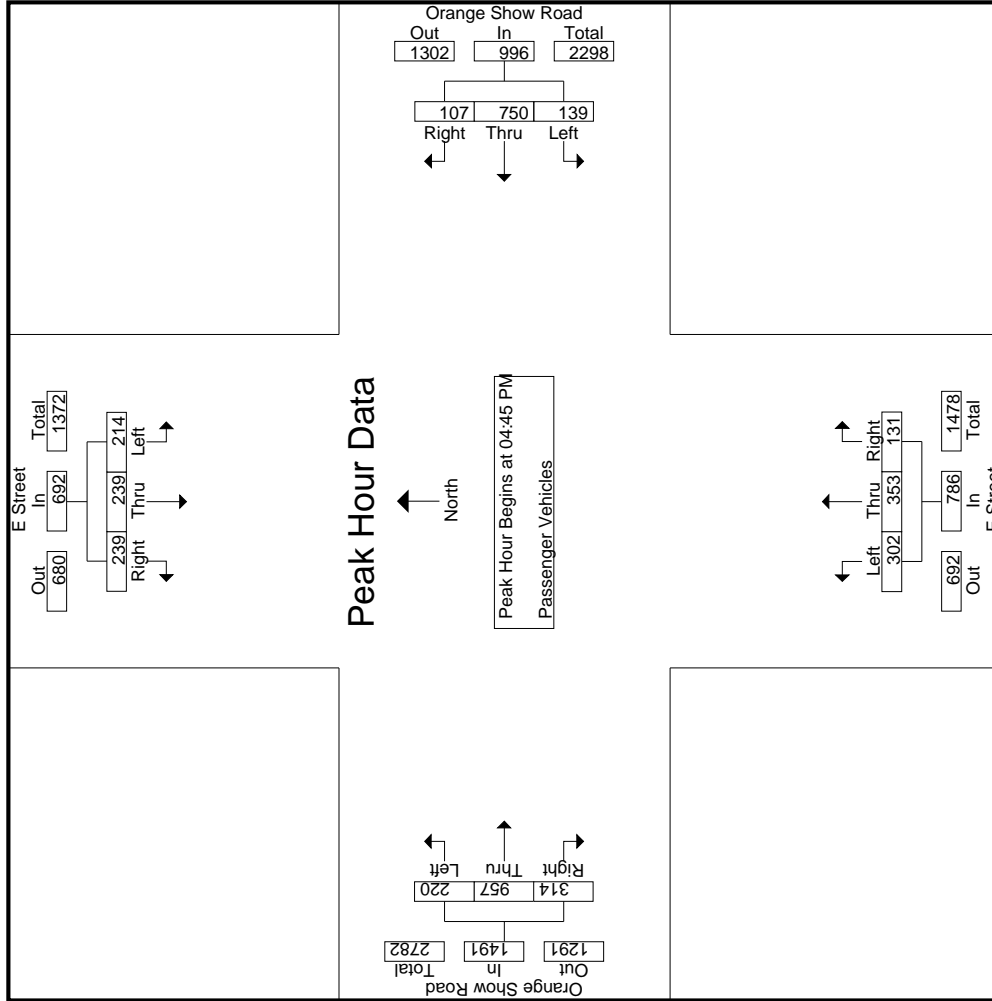
Start Time	E Street Southbound						Orange Show Road Westbound						E Street Northbound						Orange Show Road Eastbound					
	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total
04:00 PM	49	67	55	30	171	77	34	190	29	9	253	184	77	76	31	11	184	55	198	75	27	328	77	936
04:15 PM	48	80	52	29	180	80	22	161	23	9	206	183	80	77	26	5	183	50	207	82	34	339	77	908
04:30 PM	38	52	60	20	150	67	205	24	11	267	153	49	37	13	13	153	54	224	87	37	365	81	935	
04:45 PM	42	70	52	20	164	84	162	18	7	214	191	62	76	31	7	191	62	211	84	45	357	79	926	
Total	177	269	219	99	665	308	718	94	36	940	711	221	840	328	143	1389	314	840	328	143	1389	314	3705	
05:00 PM	67	46	71	24	184	67	222	26	13	292	206	41	250	70	36	361	80	1043	1123					
05:15 PM	62	70	48	26	180	37	186	29	15	252	212	65	223	86	47	374	94	1018	1112					
05:30 PM	43	53	68	30	164	24	180	34	18	238	177	52	273	74	35	399	90	978	1068					
05:45 PM	37	56	46	23	139	28	159	26	12	213	167	61	251	77	32	389	70	908	978					
Total	209	225	233	103	667	133	747	115	58	995	762	219	997	307	150	1523	334	3947	4281					
Grand Total	386	494	452	202	1332	261	1465	209	94	1935	1473	440	1837	635	293	2912	648	7652	8300					
Approach %	29	37.1	33.9		17.4	13.5	75.7	10.8		25.3	19.2	15.1	63.1	21.8		38.1	7.8	92.2						
Total %	5	6.5	5.9		17.4	3.4	19.1	2.7		25.3	19.2	5.8	24	8.3		38.1	7.8	92.2						

Start Time	E Street Southbound						Orange Show Road Westbound						E Street Northbound						Orange Show Road Eastbound					
	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1	42	70	52	20	164	84	162	18	7	214	191	62	76	31	11	184	55	198	75	27	328	77	936	
Peak Hour for Entire Intersection Begins at 04:45 PM	42	70	52	20	164	84	162	18	7	214	191	62	76	31	11	184	55	198	75	27	328	77	936	
04:45 PM	42	70	52	20	164	84	162	18	7	214	191	62	76	31	11	184	55	198	75	27	328	77	936	
05:00 PM	67	46	71	24	184	67	222	26	13	292	206	41	250	70	36	361	80	1043	1123					
05:15 PM	62	70	48	26	180	37	186	29	15	252	212	65	223	86	47	374	94	1018	1112					
05:30 PM	43	53	68	30	164	24	180	34	18	238	177	52	273	74	35	399	90	978	1068					
05:45 PM	37	56	46	23	139	28	159	26	12	213	167	61	251	77	32	389	70	908	978					
Total Volume	214	239	239		692	139	750	107		996	786	220	957	314		1491	314	84	211	84	357	926		
% App. Total	30.9	34.5	34.5		34.5	14	75.3	10.7		25.3	19.2	14.8	64.2	21.1		38.1	7.8	92.2						
PHF	.799	.854	.842		.940	.790	.845	.787		.853	.799	.846	.876	.913		.934	.950							

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Start Time	E Street Southbound				Orange Show Road Westbound				E Street Northbound				Orange Show Road Eastbound			
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																
Peak Hour for Each Approach Begins at:																
	04:45 PM				04:45 PM				04:45 PM				04:45 PM			
+0 mins.	42	70	52	164	34	162	18	214	84	76	31	191	62	211	84	357
+15 mins.	67	46	71	184	44	222	26	292	67	98	41	206	41	250	70	361
+30 mins.	62	70	48	180	37	186	29	252	75	99	38	212	65	223	86	374
+45 mins.	43	53	68	164	24	180	34	238	76	80	21	177	52	273	74	399
Total Volume	214	239	239	692	139	750	107	996	302	353	131	786	220	957	314	1491
% App. Total	30.9	34.5	34.5	940	14	75.3	10.7	853	38.4	44.9	16.7	927	14.8	64.2	21.1	934
PHF	.799	.854	.842	.940	.790	.845	.787	.853	.899	.891	.799	.927	.846	.876	.913	.934

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Groups Printed- Large 2 Axle Vehicles

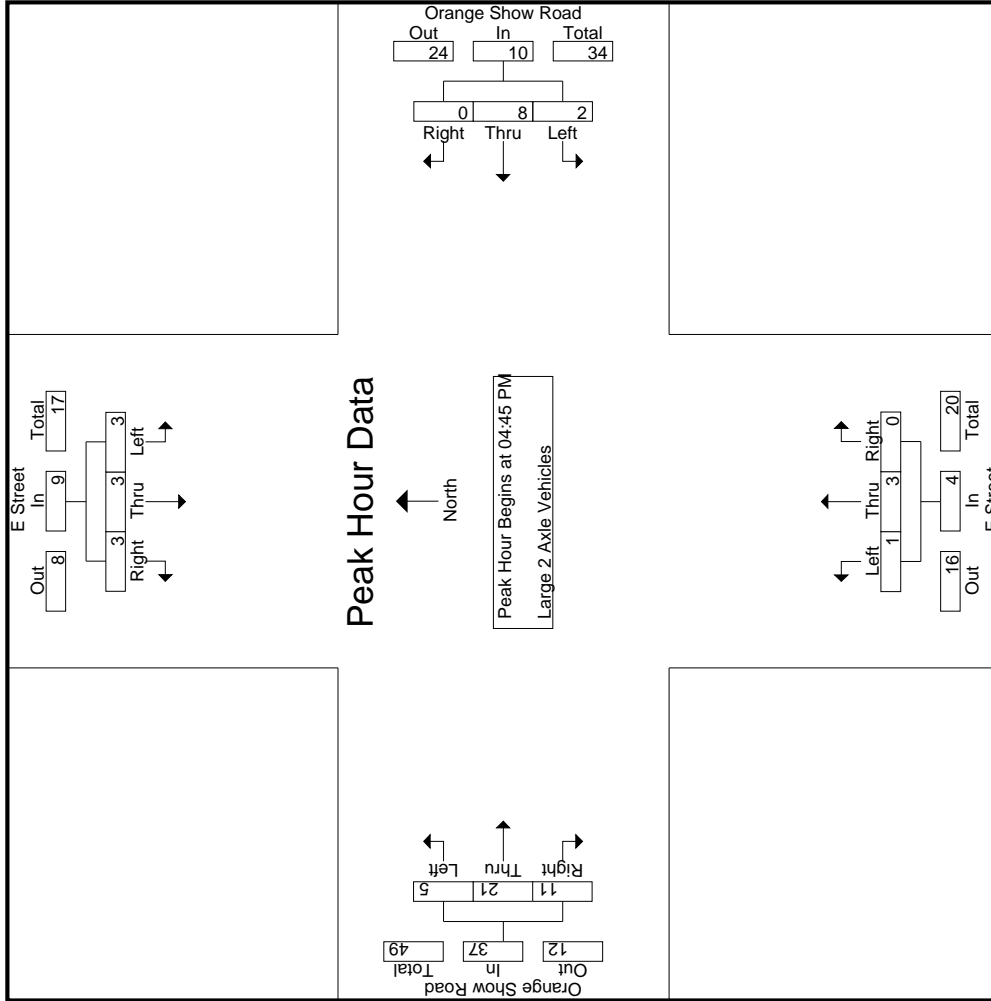
Start Time	E Street Southbound						Orange Show Road Westbound						E Street Northbound						Orange Show Road Eastbound								
	Left		Right		RTOR		Left		Right		RTOR		Left		Right		RTOR		Left		Right		RTOR				
	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total			
04:00 PM	0	1	1	1	2	14	2	11	1	0	0	1	1	1	1	1	1	1	1	7	13	11	3	31	5	48	53
04:15 PM	0	4	0	0	4	15	4	9	2	0	0	1	1	0	0	0	0	0	7	11	9	0	27	0	48	48	
04:30 PM	1	1	1	0	3	7	2	5	0	0	0	1	0	0	2	2	0	0	4	8	3	0	15	0	27	27	
04:45 PM	0	1	1	1	2	5	2	3	0	0	0	1	0	0	1	1	0	0	1	10	5	1	16	2	24	26	
Total	1	7	3	2	11	41	10	28	3	0	0	4	2	3	1	6	1	6	19	42	28	4	89	7	147	154	
05:00 PM	1	0	0	0	1	2	0	2	0	0	0	1	0	0	1	1	0	0	3	4	2	0	9	0	13	13	
05:15 PM	0	1	2	0	3	1	0	1	0	0	0	1	0	0	1	1	0	0	0	2	2	2	4	2	9	11	
05:30 PM	2	1	0	0	3	2	0	2	0	0	0	1	0	0	1	1	0	0	1	5	2	0	8	0	14	14	
05:45 PM	1	0	0	0	1	1	0	1	0	0	1	1	1	1	2	2	3	3	2	3	3	0	8	1	12	13	
Total	4	2	2	0	8	6	0	6	0	0	0	3	1	1	5	6	14	9	6	14	9	2	29	3	48	51	
Grand Total	5	9	5	2	19	47	10	34	3	0	0	4	2	11	25	56	37	6	25	56	37	6	118	10	195	205	
Approach %	26.3	47.4	26.3		21.3	72.3	6.4		18.2	45.5	36.4		5.6		21.2	47.5	31.4		12.8	28.7	19		60.5	4.9	95.1		
Total %	2.6	4.6	2.6		9.7	17.4	1.5		1	2.6	2.1																

Start Time	E Street Southbound						Orange Show Road Westbound						E Street Northbound						Orange Show Road Eastbound									
	Left		Right		RTOR		Left		Right		RTOR		Left		Right		RTOR		Left		Right		RTOR					
	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total				
04:45 PM	0	1	1	1	2	3	2	2	3	0	0	5	0	1	1	1	0	0	0	1	1	0	4	1	10	5	16	24
05:00 PM	1	0	0	0	1	2	0	2	0	0	0	2	0	1	1	1	0	0	0	3	4	2	9	2	9	13		
05:15 PM	0	1	1	2	3	1	0	1	0	0	1	0	0	1	1	1	0	0	0	0	2	2	4	2	4	9		
05:30 PM	2	1	1	0	3	2	0	2	0	0	2	1	0	0	2	1	1	1	1	1	1	1	5	2	8	14		
Total Volume	3	3	3	3	9	8	2	8	0	10	1	3	0	4	5	21	11	37	60	13.5	56.8	29.7	60					
% App. Total	33.3	33.3	33.3		75.0	.667	.250	.000	.500	.750	.000	.000	.000	1.00	.417	.525	.578	.625										
PHF	.375	.750	.375		.750	.667	.250	.000	.500	.750	.000	.000	1.00	.417	.525	.578	.625											

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File Name : 03-SBCESORPM
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Start Time	E Street Southbound				Orange Show Road Westbound				E Street Northbound				Orange Show Road Eastbound			
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																
Peak Hour for Each Approach Begins at:																
	04:45 PM				04:45 PM				04:45 PM				04:45 PM			
+0 mins.	0	1	1	2	2	3	0	5	0	1	0	1	1	10	5	16
+15 mins.	1	0	0	1	0	2	0	2	0	1	0	1	3	4	2	9
+30 mins.	0	1	2	3	0	1	0	1	0	0	0	0	0	2	2	4
+45 mins.	2	1	0	3	0	2	0	2	1	0	0	1	1	5	2	8
Total Volume	3	3	3	9	2	8	0	10	1	3	0	4	5	21	11	37
% App. Total	33.3	33.3	33.3	.750	.250	.667	.000	.500	.250	.750	.000	1.000	13.5	56.8	29.7	.578
PHF	.375	.750	.375	.750	.250	.667	.000	.500	.250	.750	.000	1.000	.417	.525	.550	.578

Counts Unlimited, Inc.
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: E Street
 E/W: Orange Show Road
 Weather: Clear

File Name : 03-SBCESORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 3 Axle Vehicles

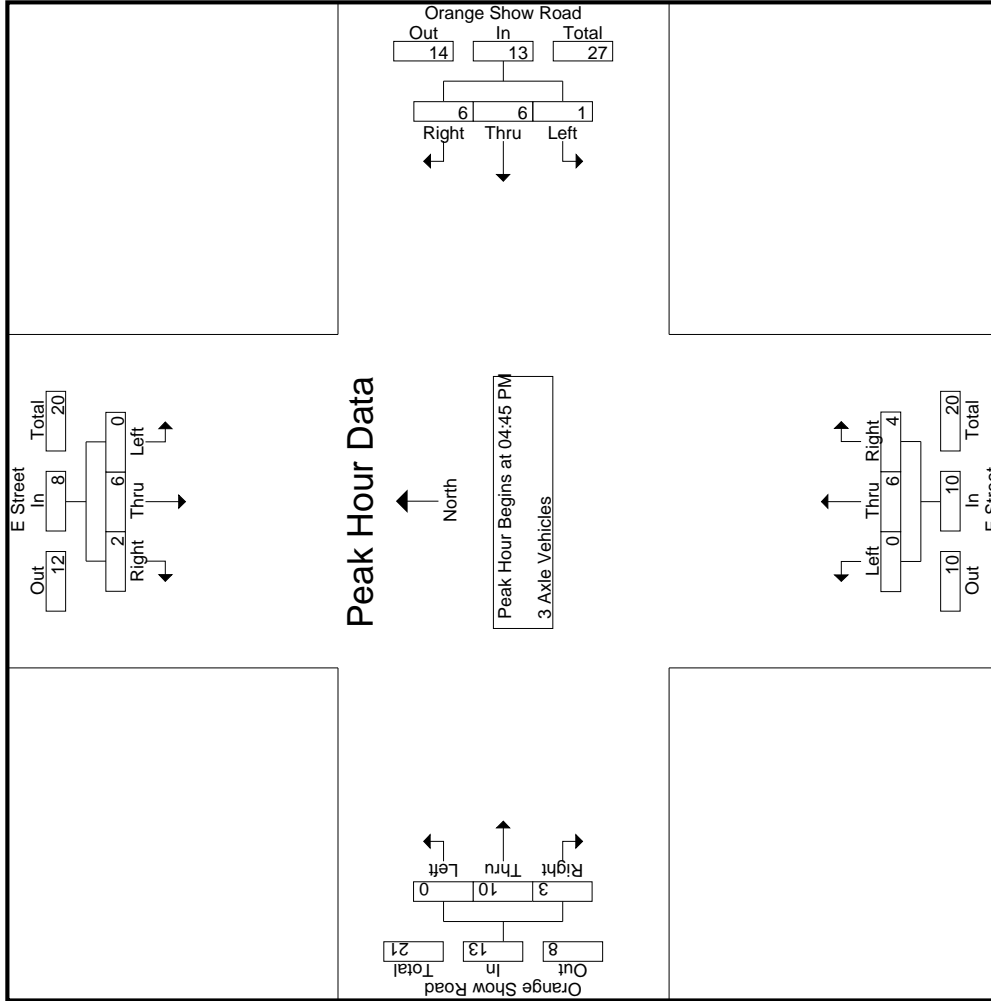
Start Time	E Street Southbound					Orange Show Road Westbound					E Street Northbound					Orange Show Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	2	1	1	3	0	2	2	2	4	0	1	0	0	1	0	4	1	1	5	4	13	17
04:15 PM	0	1	0	0	1	0	2	0	0	2	0	2	0	0	2	0	7	0	0	7	0	12	12
04:30 PM	0	1	0	0	1	0	2	6	6	8	0	1	4	4	5	0	2	0	2	10	16	26	
04:45 PM	0	2	0	0	2	1	0	1	1	2	0	2	0	0	2	0	4	0	0	4	1	10	11
Total	0	6	1	1	7	1	6	9	9	16	0	6	4	4	10	0	17	1	1	18	15	51	66
05:00 PM	0	1	0	0	1	0	2	0	0	2	0	0	1	0	1	0	1	1	1	2	1	6	7
05:15 PM	0	1	1	1	2	0	3	4	4	7	0	2	3	3	5	0	2	2	4	10	18	28	
05:30 PM	0	2	1	1	3	0	1	1	1	2	0	2	0	0	2	0	3	0	0	3	2	10	12
05:45 PM	0	1	0	0	1	0	2	0	0	2	0	1	0	0	1	0	3	0	0	3	0	7	7
Total	0	5	2	2	7	0	8	5	5	13	0	5	4	3	9	0	9	3	3	12	13	41	54
Grand Total	0	11	3	3	14	1	14	14	14	29	0	11	8	7	19	0	26	4	4	30	28	92	120
Approch %	0	78.6	21.4		15.2	3.4	48.3	48.3		31.5	0	57.9	42.1		20.7	0	86.7	13.3		32.6	23.3	76.7	
Total %	0	12	3.3			1.1	15.2	15.2			0	12	8.7			0	28.3	4.3					

Start Time	E Street Southbound					Orange Show Road Westbound					E Street Northbound					Orange Show Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:45 PM	0	2	0	0	2	1	0	1	2	2	0	2	0	0	2	0	2	0	0	4	0	4	10
05:00 PM	0	1	0	0	1	0	2	0	0	2	0	0	0	0	1	0	1	1	1	1	1	2	6
05:15 PM	0	1	1	1	2	0	0	3	4	7	0	7	0	2	3	0	5	0	2	2	2	4	18
05:30 PM	0	2	1	1	3	0	0	1	1	2	0	2	0	0	2	0	2	0	0	3	0	3	10
Total Volume	0	6	2	2	8	1	6	6	6	13	0	6	4	4	10	0	10	3	3	13	13	44	44
% App. Total	0	.75	.25		.667	7.7	46.2	46.2		31.5	0	60	40		76.9	0	76.9	23.1		23.1	23.1	76.7	76.7
PHF	.000	.750	.500		.667	.250	.500	.375		.464	.000	.750	.333		.500	.000	.625	.375		.813	.813	.611	.611

Counts Unlimited, Inc.
 PO Box 1178
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 (951) 268-6268

City of San Bernardino
 N/S: E Street
 E/W: Orange Show Road
 Weather: Clear

File Name : 03-SBCESORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



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City of San Bernardino
 N/S: E Street
 E/W: Orange Show Road
 Weather: Clear

File Name : 03-SBCESORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	E Street Southbound			Orange Show Road Westbound			E Street Northbound			Orange Show Road Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	04:45 PM			04:45 PM			04:45 PM			04:45 PM				
+0 mins.	0	2	0	1	0	1	2	2	0	0	0	4	0	4
+15 mins.	0	1	0	0	2	0	2	1	0	1	1	1	1	2
+30 mins.	0	1	1	0	3	4	7	5	0	3	2	2	2	4
+45 mins.	0	2	1	0	1	1	2	2	0	0	0	3	0	3
Total Volume	0	6	2	1	6	6	13	10	0	4	10	3	3	13
% App. Total	0	.75	.25	7.7	46.2	46.2	.464	.500	0	40	23.1	.375	0	.813
PHF	.000	.750	.500	.250	.500	.375	.464	.500	.000	.333	.500	.375	.000	.813

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City of San Bernardino
 N/S: E Street
 E/W: Orange Show Road
 Weather: Clear

File Name : 03-SBCESORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 4+ Axle Trucks

Start Time	E Street Southbound						Orange Show Road Westbound						E Street Northbound						Orange Show Road Eastbound											
	Left		Right		RTOR		Thru		Right		RTOR		App. Total		Left		Thru		Right		RTOR		App. Total		Exclu. Total		Inclu. Total		Int. Total	
	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right
04:00 PM	0	0	1	0	0	0	6	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	2	0	0	9			
04:15 PM	0	0	1	1	0	0	3	0	0	0	0	3	0	0	0	0	0	14	0	0	0	0	14	1	18	19				
04:30 PM	0	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0	4	0	0	0	0	4	0	6	6				
04:45 PM	0	0	0	0	0	0	2	0	0	0	0	2	1	0	0	0	1	6	0	0	0	0	6	0	9	9				
Total	0	0	2	1	2	0	13	0	0	0	13	1	0	0	0	1	0	26	0	0	0	0	26	1	42	43				
05:00 PM	0	0	0	0	0	0	7	0	0	0	0	7	0	0	0	0	0	5	0	0	0	0	5	0	12	12				
05:15 PM	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	8	0	0	0	0	8	0	10	10				
05:30 PM	0	0	0	0	0	0	4	0	0	0	4	0	0	0	0	0	0	4	0	0	0	0	4	0	8	8				
05:45 PM	0	0	0	0	0	0	7	0	0	0	7	1	0	0	0	0	1	8	0	0	0	0	8	0	16	16				
Total	0	0	0	0	0	0	20	0	0	0	20	1	0	0	0	0	1	25	0	0	0	0	25	0	46	46				
Grand Total	0	0	2	1	2	0	33	0	0	0	33	2	0	0	0	2	0	51	0	0	0	0	51	1	88	89				
Approach %	0	0	100			0	100	0			100	0	0	0			100	0				100	0	1.1	98.9					
Total %	0	0	2.3			0	37.5	0			37.5	2.3	0	0			58	0				58	1.1	98.9						

3.1-92

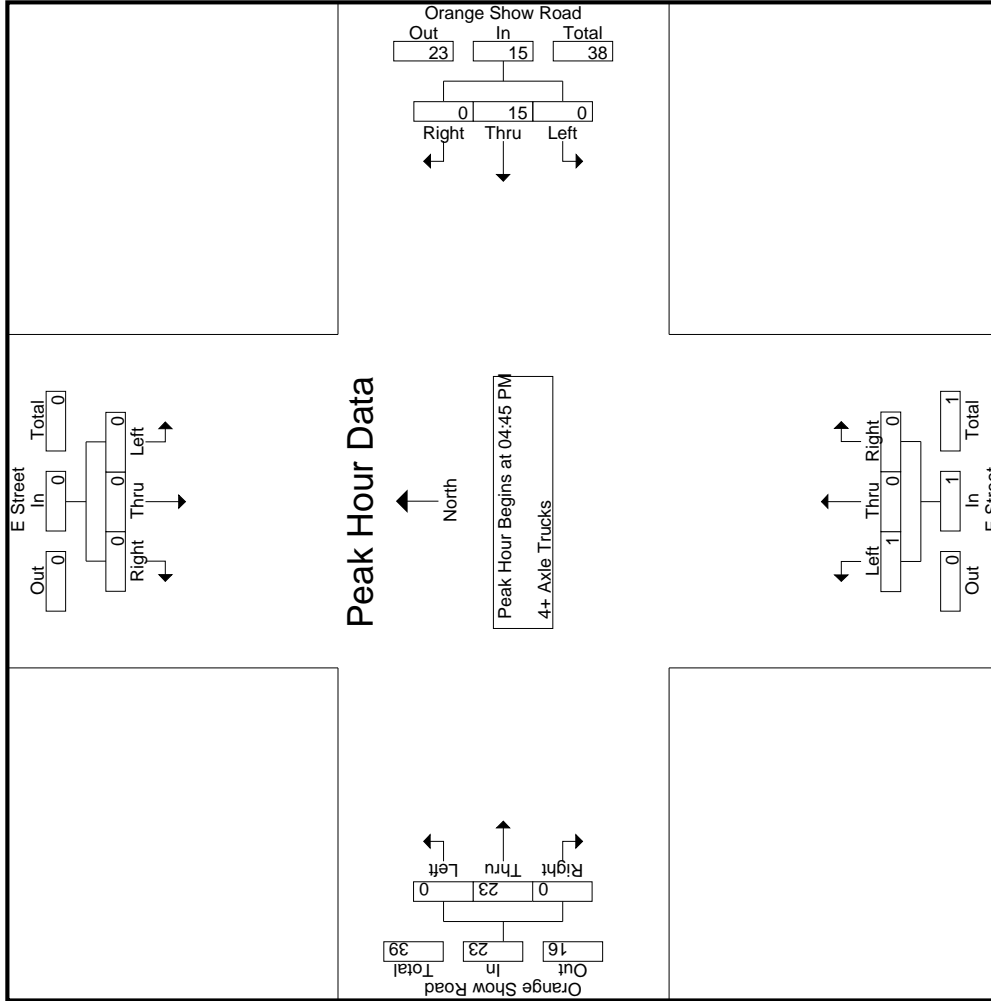
Start Time	E Street Southbound						Orange Show Road Westbound						E Street Northbound						Orange Show Road Eastbound									
	Left		Right		RTOR		Thru		Right		RTOR		Thru		Right		RTOR		Thru		Right		RTOR		App. Total		Int. Total	
	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right	Thru	Right
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	6	0	6	9		
05:00 PM	0	0	0	0	0	0	7	0	0	0	7	0	0	0	0	0	0	5	0	0	0	0	5	0	5	12		
05:15 PM	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	8	0	0	0	0	8	0	8	10		
05:30 PM	0	0	0	0	0	0	4	0	0	0	4	0	0	0	0	0	0	4	0	0	0	0	4	0	4	8		
Total Volume	0	0	0	0	0	0	15	0	0	0	15	1	0	0	0	0	1	23	0	0	0	0	23	0	23	39		
% App. Total	0	0	0	0	0	0	100	0			100	0	0			0	100	0				100	0	100	0			
PHF	.000	.000	.000	.000	.000	.000	.536	.000			.536	.250	.000			.000	.250	.000				.000	.719	.000	.719	.813		

Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:45 PM

Counts Unlimited, Inc.
 PO Box 1178
 Corona, CA 92878
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City of San Bernardino
 N/S: E Street
 E/W: Orange Show Road
 Weather: Clear

File Name : 03-SBCESORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



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City of San Bernardino
 N/S: E Street
 E/W: Orange Show Road
 Weather: Clear

File Name : 03-SBCESORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	E Street Southbound				Orange Show Road Westbound				E Street Northbound				Orange Show Road Eastbound			
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																
Peak Hour for Each Approach Begins at:																
	04:45 PM															
+0 mins.	0	0	0	0	0	2	0	0	2	1	0	0	0	6	0	6
+15 mins.	0	0	0	0	0	7	0	0	7	0	0	0	0	5	0	5
+30 mins.	0	0	0	0	0	2	0	0	2	0	0	0	0	8	0	8
+45 mins.	0	0	0	0	0	4	0	0	4	0	0	0	0	4	0	4
Total Volume	0	0	0	0	0	15	0	0	15	1	0	0	0	23	0	23
% App. Total	0	0	0	0	0	100	0	0	100	100	0	0	0	100	0	100
PHF	.000	.000	.000	.000	.000	.536	.000	.000	.536	.250	.000	.000	.000	.719	.000	.719

Location: San Bernardino
 N/S: E Street
 E/W: Orange Show Road



Date: 3/2/2017
 Day: Thursday

PEDESTRIANS

	North Leg E Street	East Leg Orange Show Road	South Leg E Street	West Leg Orange Show Road	TOTAL
7:00 AM	0	1	0	1	2
7:15 AM	0	0	0	0	0
7:30 AM	0	1	0	0	1
7:45 AM	0	1	0	0	1
8:00 AM	0	0	0	0	0
8:15 AM	2	2	0	1	5
8:30 AM	0	1	0	0	1
8:45 AM	0	0	0	1	1
TOTAL VOLUMES:	2	6	0	3	11

	North Leg E Street	East Leg Orange Show Road	South Leg E Street	West Leg Orange Show Road	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	0	2	0	1	3
4:30 PM	0	0	0	0	0
4:45 PM	0	1	0	1	2
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	1	0	1	2
5:45 PM	1	1	0	0	2
TOTAL VOLUMES:	1	5	0	3	9

Location: San Bernardino
 N/S: E Street
 E/W: Orange Show Road



Date: 3/2/2017
 Day: Thursday

BICYCLES

	North Leg E Street	East Leg Orange Show Road	South Leg E Street	West Leg Orange Show Road	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

	North Leg E Street	East Leg Orange Show Road	South Leg E Street	West Leg Orange Show Road	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

Counts Unlimited
 PO Box 1178
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 (951) 268-6268

City of San Bernardino
 N/S: Arrowhead Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 04-SBCARORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	Arrowhead Avenue Southbound						Orange Show Road Westbound						AMF Arrowhead Lanes Driveway Northbound						Orange Show Road Eastbound							
	Left		Right		RTOR		Left		Right		RTOR		Left		Right		RTOR		Left		Right		RTOR			
	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total		
07:00 AM	13	53	1	68	56	11	4	68	0	0	0	0	0	0	0	0	0	0	0	53	158	0	211	21	332	353
07:15 AM	15	41	0	85	67	18	7	85	0	3	0	0	3	70	215	2	1	287	18	416	434	18	416	434		
07:30 AM	20	49	1	84	66	17	5	84	0	0	0	0	0	53	225	5	1	283	16	416	432	16	416	432		
07:45 AM	29	83	7	73	55	16	6	73	0	0	1	0	1	57	234	8	1	299	24	456	480	24	456	480		
Total	77	226	10	310	244	62	22	310	0	3	1	0	4	233	832	15	3	1080	79	1620	1699	79	1620	1699		
08:00 AM	20	75	2	105	71	31	11	105	0	0	3	3	3	76	239	2	0	317	41	500	541	41	500	541		
08:15 AM	18	60	2	94	73	18	7	94	1	0	0	0	1	40	155	4	0	199	19	354	373	19	354	373		
08:30 AM	16	55	0	53	38	13	8	53	0	0	0	0	0	59	156	0	0	215	22	323	345	22	323	345		
08:45 AM	19	59	0	87	66	20	10	87	0	1	1	1	2	51	130	3	1	184	27	332	359	27	332	359		
Total	73	249	4	339	248	82	36	339	1	1	4	4	6	226	680	9	1	915	109	1509	1618	109	1509	1618		
Grand Total	150	475	13	649	492	144	58	649	1	4	5	4	10	459	1512	24	4	1995	188	3129	3317	188	3129	3317		
Approach %	31.6	65.5	2	75.8	75.8	22.2		20.7	10	40	50		0.3	14.7	48.3	0.8		63.8	5.7	94.3		5.7	94.3			
Total %	4.8	9.9	0.4	15.2	15.7	4.6		20.7	0	0.1	0.2		0.3	14.7	48.3	0.8		63.8	5.7	94.3		5.7	94.3			
Passenger Vehicles	146	496	12	644	436	139		644	1	4	4		12	423	1419	23		1869	0	0	3021	0	0	3021		
% Passenger Vehicles	97.3	83.1	92.3	91.1	88.6	96.5	98.3	91.1	100	100	80	75	85.7	92.2	93.8	95.8	100	93.5	0	0	91.1	0	0	91.1		
Large 2 Axle Vehicles	4	80	1	30	25	3		30	0	0	1	2	2	20	46	0		66	0	0	178	0	0	178		
% Large 2 Axle Vehicles	2.7	13.4	7.7	4.2	5.1	2.1	1.7	4.2	0	0	20	25	14.3	4.4	3	0		3.3	0	0	5.4	0	0	5.4		
3 Axle Vehicles	0	5	0	22	0	0		22	0	0	0	0	0	4	11	0		15	0	0	42	0	0	42		
% 3 Axle Vehicles	0	0.8	0	3.1	4.5	0	0	3.1	0	0	0	0	0	0.9	0.7	0		0.8	0	0	1.3	0	0	1.3		
4+ Axle Trucks	0	16	0	11	9	2		11	0	0	0	0	0	12	36	1		49	0	0	76	0	0	76		
% 4+ Axle Trucks	0	2.7	0	1.6	1.8	1.4	0	1.6	0	0	0	0	0	2.6	2.4	4.2		2.5	0	0	2.3	0	0	2.3		

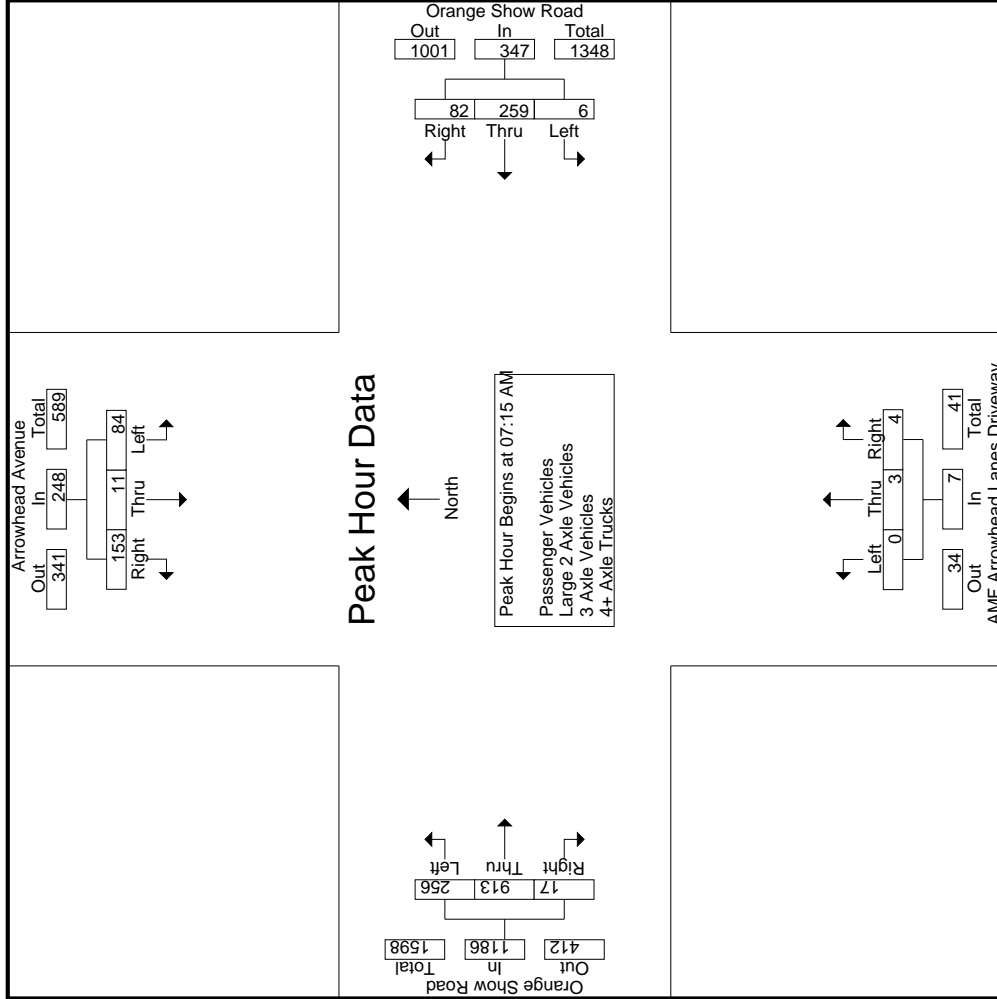
Start Time	Arrowhead Avenue Southbound						Orange Show Road Westbound						AMF Arrowhead Lanes Driveway Northbound						Orange Show Road Eastbound						
	Left		Right		RTOR		Left		Right		RTOR		Left		Right		RTOR		Left		Right		RTOR		
	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	
07:15 AM	15	25	1	41	0	67	18	85	0	0	3	0	0	0	0	0	0	0	0	3	215	2	287	2	287
07:30 AM	20	28	1	49	1	66	17	84	0	0	0	0	0	0	0	0	0	0	0	0	225	5	283	5	283
07:45 AM	29	47	7	83	2	55	16	73	0	0	0	1	1	57	234	8	1	299	1	299	234	8	299	456	
08:00 AM	20	53	2	75	3	71	31	105	0	0	0	0	3	76	239	2	3	317	0	0	239	2	317	500	
Total Volume	84	153	11	248	6	259	82	347	0	0	3	4	7	256	913	17	1186	1788	0	0	1186	17	1186	1788	
% App. Total	33.9	61.7	4.4	74.6	1.7	74.6	23.6	74.6	0	0	42.9	57.1	7	21.6	77	1.4	1.4	77	0	0	77	1.4	1.4	77	
PHF	.724	.722	.393	.747	.500	.912	.661	.826	.000	.000	.250	.333	.583	.842	.955	.531	.935	.894			.935	.531	.935	.894	

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:15 AM

Counts Unlimited
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City of San Bernardino
 N/S: Arrowhead Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 04-SBCARORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



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City of San Bernardino
 N/S: Arrowhead Avenue
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File Name : 04-SBCARORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Arrowhead Avenue Southbound			Orange Show Road Westbound			AMF Arrowhead Lanes Driveway Northbound			Orange Show Road Eastbound			App. Total	Int. Total		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right				
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																
Peak Hour for Each Approach Begins at:																
	07:45 AM			07:30 AM			07:15 AM			07:15 AM						
+0 mins.	29	7	47	83	1	66	17	84	0	3	0	0	70	215	2	287
+15 mins.	20	2	53	75	2	55	16	73	0	0	0	0	53	225	5	283
+30 mins.	18	2	40	60	3	71	31	105	0	0	1	1	57	234	8	299
+45 mins.	16	0	39	55	3	73	18	94	0	0	3	3	76	239	2	317
Total Volume	83	11	179	273	9	265	82	356	0	3	4	7	256	913	17	1186
% App. Total	30.4	4	65.6	.822	2.5	74.4	23	.848	0	42.9	57.1	7	21.6	77	1.4	.935
PHF	.716	.393	.844	.822	.750	.908	.661	.848	.000	.250	.333	.583	.842	.955	.531	.935

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Arrowhead Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 04-SBCARORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles

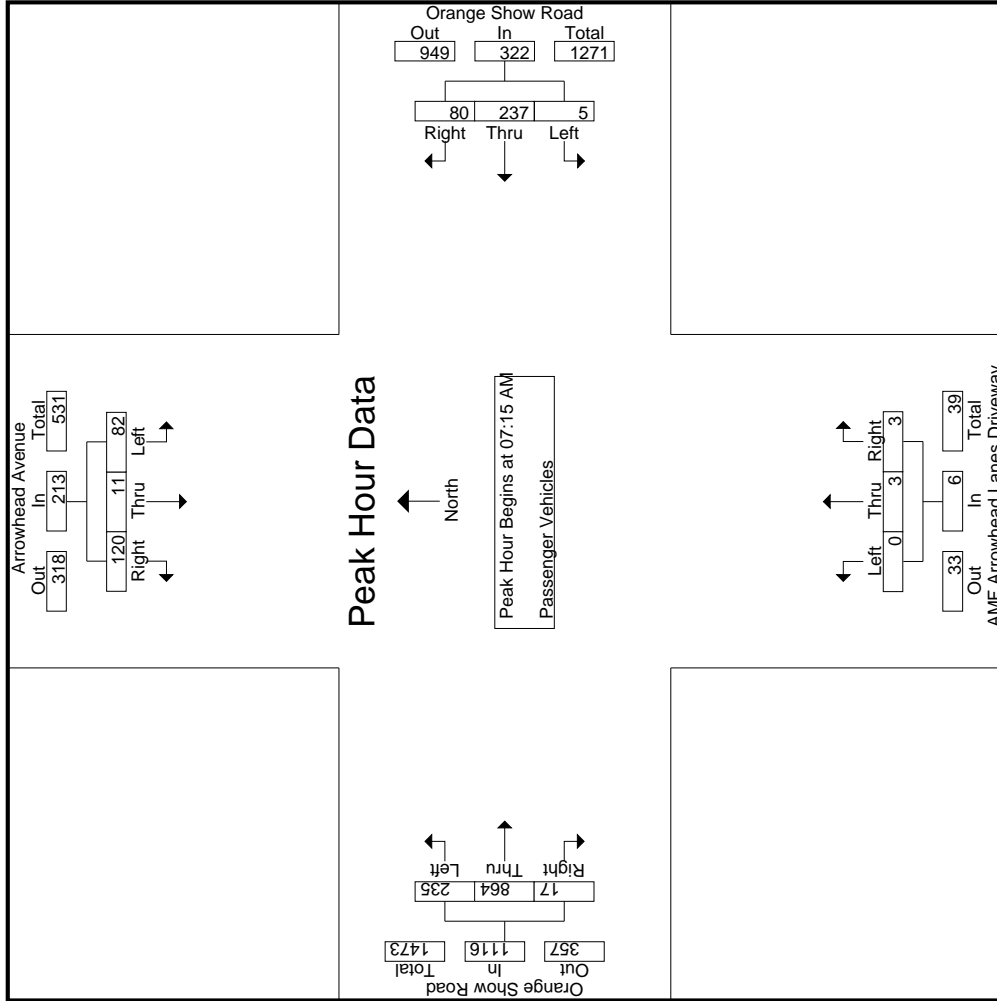
Start Time	Arrowhead Avenue Southbound				Orange Show Road Westbound				AMF Arrowhead Lanes Driveway Northbound				Orange Show Road Eastbound				Exclu. Total	Inclu. Total	Int. Total				
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left				Thru	Right	RTOR	App. Total
07:00 AM	13	1	29	13	43	1	50	11	4	62	0	0	0	0	0	52	149	0	0	201	17	306	323
07:15 AM	14	1	19	6	34	0	58	17	7	75	0	3	0	0	3	67	205	2	1	274	14	386	400
07:30 AM	19	1	21	7	41	1	60	17	5	78	0	0	0	0	0	47	212	5	1	264	13	383	396
07:45 AM	29	7	35	12	71	2	53	16	6	71	0	0	1	0	1	54	226	8	1	288	19	431	450
Total	75	10	104	38	189	4	221	61	22	286	0	3	1	0	4	220	792	15	3	1027	63	1506	1569
08:00 AM	20	2	45	23	67	2	66	30	11	98	0	0	2	2	2	67	221	2	0	290	36	457	493
08:15 AM	17	2	31	11	50	3	69	18	7	90	1	0	0	0	1	39	143	4	0	186	18	327	345
08:30 AM	16	0	29	13	45	2	34	11	7	47	0	0	0	0	0	54	142	0	0	196	20	288	308
08:45 AM	18	0	30	12	48	1	46	19	10	66	0	1	1	1	2	43	121	2	1	166	24	282	306
Total	71	4	135	59	210	8	215	78	35	301	1	1	3	3	5	203	627	8	1	838	98	1354	1452
Grand Total	146	14	239	97	399	12	436	139	57	587	1	4	4	3	9	423	1419	23	4	1865	161	2860	3021
Approach %	36.6	3.5	59.9			2	74.3	23.7			11.1	44.4	44.4			22.7	76.1	1.2			65.2	5.3	94.7
Total %	5.1	0.5	8.4			0.4	15.2	4.9			0	0.1	0.1			14.8	49.6	0.8					

Start Time	Arrowhead Avenue Southbound				Orange Show Road Westbound				AMF Arrowhead Lanes Driveway Northbound				Orange Show Road Eastbound				Exclu. Total	Inclu. Total	Int. Total				
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left				Thru	Right	RTOR	App. Total
07:15 AM	14	1	19		34	0	58	17		75	0	3	0		3	67	205	2		274	2	274	386
07:30 AM	19	1	21		41	1	60	17		78	0	0	0		0	47	212	5		264	5	264	383
07:45 AM	29	7	35		71	2	53	16		71	0	0	0		1	54	226	8		288	8	288	431
08:00 AM	20	2	45		67	2	53	16		98	0	0	0		2	67	221	2		290	2	290	457
Total Volume	82	11	120		213	5	237	80		322	0	3	3		6	235	864	17		1116	17	1116	1657
% App. Total	38.5	5.2	56.3			1.6	73.6	24.8			0	50	50			21.1	77.4	1.5					
PHF	.707	.393	.667		.750	.625	.898	.667		.821	.000	.250	.375		.500	.877	.956	.531		.962		.906	

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Arrowhead Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 04-SBCARORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Arrowhead Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 04-SBCARORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Arrowhead Avenue Southbound			Orange Show Road Westbound			AMF Arrowhead Lanes Driveway Northbound			Orange Show Road Eastbound				
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	07:15 AM													
+0 mins.	14	1	19	0	58	17	75	0	3	0	67	205	2	274
+15 mins.	19	1	21	1	60	17	78	0	0	0	47	212	5	264
+30 mins.	29	7	35	2	53	16	71	0	0	1	54	226	8	288
+45 mins.	20	2	45	2	66	30	98	0	0	2	67	221	2	290
Total Volume	82	11	120	5	237	80	322	0	3	3	235	864	17	1116
% App. Total	38.5	5.2	56.3	1.6	73.6	24.8	.821	0	50	50	21.1	77.4	1.5	.962
PHF	.707	.393	.667	.625	.898	.667	.821	.000	.250	.375	.877	.956	.531	.962

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Arrowhead Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 04-SBCARORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Large 2 Axle Vehicles

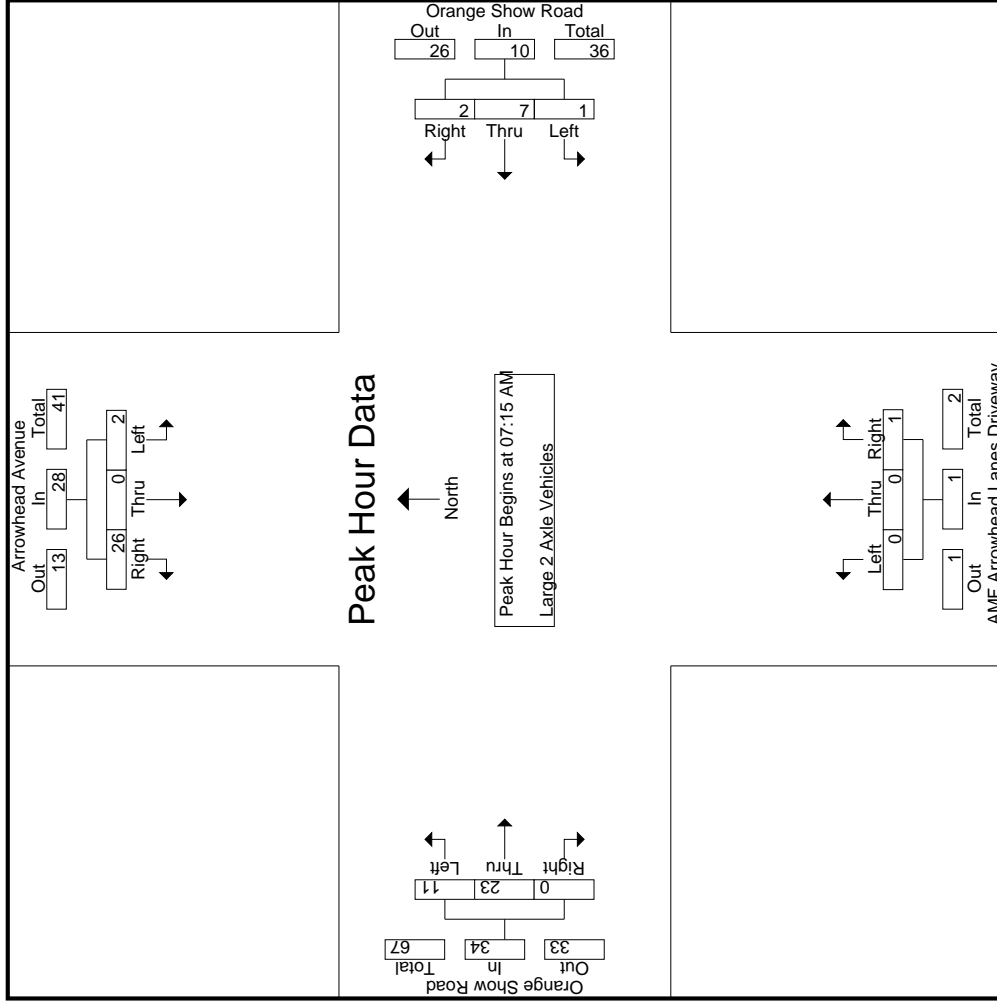
Start Time	Arrowhead Avenue Southbound					Orange Show Road Westbound					AMF Arrowhead Lanes Driveway Northbound					Orange Show Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	9	3	9	0	3	0	0	3	0	0	0	0	0	1	6	0	0	7	3	19	22
07:15 AM	1	0	4	3	5	0	5	1	0	6	0	0	0	0	0	1	5	0	0	6	3	17	20
07:30 AM	1	0	6	3	7	0	0	0	0	0	0	0	0	0	0	2	6	0	0	8	3	15	18
07:45 AM	0	0	9	3	9	0	0	0	0	0	0	0	0	0	0	1	2	0	0	3	3	12	15
Total	2	0	28	12	30	0	8	1	0	9	0	0	0	0	0	5	19	0	0	24	12	63	75
08:00 AM	0	0	7	4	7	1	2	1	0	4	0	0	1	1	1	7	10	0	0	17	5	29	34
08:15 AM	1	0	5	1	6	0	1	0	0	1	0	0	0	0	0	1	3	0	0	4	1	11	12
08:30 AM	0	0	6	1	6	0	1	1	1	2	0	0	0	0	0	3	8	0	0	11	2	19	21
08:45 AM	1	0	9	3	10	0	13	0	0	13	0	0	0	0	0	4	6	0	0	10	3	33	36
Total	2	0	27	9	29	1	17	2	1	20	0	0	1	1	1	15	27	0	0	42	11	92	103
Grand Total	4	0	55	21	59	1	25	3	1	29	0	0	1	1	1	20	46	0	0	66	23	155	178
Approach %	6.8	0	93.2		3.4	86.2	10.3			18.7	0	0	100	0	0.6	30.3	69.7	0	0	42.6	12.9	87.1	
Total %	2.6	0	35.5		0.6	16.1	1.9				0	0	0.6	0		12.9	29.7	0	0				

Start Time	Arrowhead Avenue Southbound					Orange Show Road Westbound					AMF Arrowhead Lanes Driveway Northbound					Orange Show Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:15 AM	1	0	4		5	0	5	1	6	6	0	0	0	0	0	1	5	0	0	6	0	6	17
07:30 AM	1	0	6		7	0	0	0	0	0	0	0	0	0	0	2	6	0	0	8	0	8	15
07:45 AM	0	0	9		9	0	0	0	0	0	0	0	0	0	0	1	2	0	0	3	0	3	12
08:00 AM	0	0	7		7	1	1	2	4	4	0	0	1	1	1	7	10	0	0	17	0	17	29
Total Volume	2	0	26		28	1	7	2	10	10	0	0	0	0	1	11	23	0	0	34	0	34	73
% App. Total	7.1	0	92.9		7.78	10	70	20		100	0	0	100	0		32.4	67.6	0	0				
PHF	.500	.000	.722		.778	.250	.350	.500		.417	.000	.000	.250	.000		.393	.575	.000		.500		.629	

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Arrowhead Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 04-SBCARORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
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 (951) 268-6268

City of San Bernardino
 N/S: Arrowhead Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 04-SBCARORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Arrowhead Avenue Southbound			Orange Show Road Westbound			AMF Arrowhead Lanes Driveway Northbound			Orange Show Road Eastbound				
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1	07:15 AM													
Peak Hour for Each Approach Begins at:	07:15 AM													
+0 mins.	1	0	4	5	0	1	6	0	0	0	0	0	0	6
+15 mins.	1	0	6	7	0	0	0	0	0	2	6	0	0	8
+30 mins.	0	0	9	9	0	0	0	0	0	1	2	0	0	3
+45 mins.	0	0	7	7	1	2	4	0	1	7	10	0	0	17
Total Volume	2	0	26	28	1	7	10	0	1	11	23	0	0	34
% App. Total	7.1	0	92.9	77.8	10	70	20	0	100	32.4	67.6	0	0	
PHF	.500	.000	.722	.778	.250	.350	.417	.000	.250	.393	.575	.000	.000	.500

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Arrowhead Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 04-SBCARORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 3 Axle Vehicles

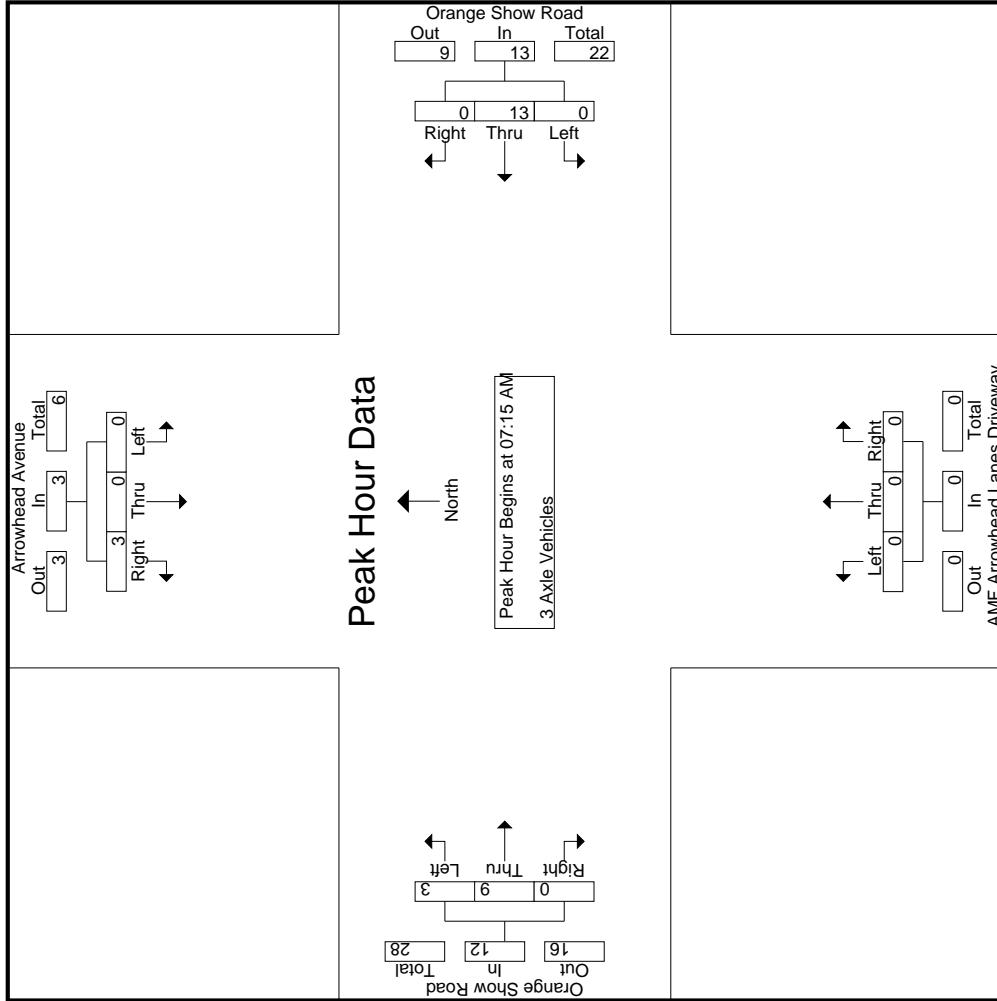
Start Time	Arrowhead Avenue Southbound				Orange Show Road Westbound				AMF Arrowhead Lanes Driveway Northbound				Orange Show Road Eastbound											
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
07:00 AM	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	1	0	0	0	1	0	3	3
07:15 AM	0	0	1	1	1	3	0	0	0	3	0	0	0	0	0	1	1	0	0	2	1	6	7	7
07:30 AM	0	0	0	0	0	6	0	0	0	6	0	0	0	0	0	2	2	0	0	4	0	10	10	10
07:45 AM	0	0	1	1	1	1	0	0	0	1	0	0	0	0	0	3	0	0	0	3	1	5	6	6
Total	0	0	2	2	2	12	0	0	0	12	0	0	0	0	0	3	7	0	0	10	2	24	26	26
08:00 AM	0	0	1	0	1	3	0	0	0	3	0	0	0	0	0	0	3	0	0	3	0	7	7	7
08:15 AM	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	2	2
08:30 AM	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	1	1	0	0	2	0	4	4	4
08:45 AM	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	3	3	3
Total	0	0	1	0	1	10	0	0	0	10	0	0	0	0	0	1	4	0	0	5	0	16	16	16
Grand Total	0	0	3	2	3	22	0	0	0	22	0	0	0	0	0	4	11	0	0	15	2	40	42	42
Approach %	0	0	100		7.5	100	0	0	0	55	0	0	0	0	26.7	73.3	0	0	37.5	4.8	95.2			
Total %	0	0	7.5			55	0	0	0	55	0	0	0	0	10	27.5	0	0						

Start Time	Arrowhead Avenue Southbound				Orange Show Road Westbound				AMF Arrowhead Lanes Driveway Northbound				Orange Show Road Eastbound											
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Exclu. Total	Inclu. Total	Int. Total	
07:15 AM	0	0	1	1	0	3	0	3	0	0	0	0	0	0	0	0	1	0	0	1	0	2	6	6
07:30 AM	0	0	0	0	0	6	0	6	0	0	0	0	0	0	0	0	2	2	0	4	0	4	10	10
07:45 AM	0	0	1	1	0	1	0	1	0	0	0	0	0	0	0	0	0	3	0	3	0	3	5	5
08:00 AM	0	0	1	1	0	3	0	3	0	0	0	0	0	0	0	0	0	3	0	3	0	3	7	7
Total Volume	0	0	3	3	0	13	0	13	0	0	0	0	0	0	0	0	3	9	0	12	0	12	28	28
% App. Total	0	0	100	.750	0	100	0	100	0	0	0	0	0	0	0	0	25	75	0	75	0	75	100	100
PHF	.000	.000	.750	.750	.000	.542	.000	.542	.000	.000	.000	.000	.000	.000	.000	.000	.375	.750	.000	.750	.000	.750	.700	.700

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Arrowhead Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 04-SBCARORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
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 (951) 268-6268

City of San Bernardino
 N/S: Arrowhead Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 04-SBCARORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Arrowhead Avenue Southbound			Orange Show Road Westbound			AMF Arrowhead Lanes Driveway Northbound			Orange Show Road Eastbound						
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total		
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																
Peak Hour for Each Approach Begins at:																
	07:15 AM			07:15 AM			07:15 AM			07:15 AM			07:15 AM			
+0 mins.	0	0	1	0	3	0	0	0	0	0	0	0	1	0	2	
+15 mins.	0	0	0	0	6	0	0	0	0	0	0	0	2	2	4	
+30 mins.	0	0	1	0	1	0	0	0	0	0	0	0	0	3	3	
+45 mins.	0	0	1	0	3	0	0	0	0	0	0	0	0	3	3	
Total Volume	0	0	3	0	13	0	0	0	0	0	0	0	3	9	12	
% App. Total	0	0	100	0	100	0	0	0	0	0	0	0	25	75	0	
PHF	.000	.000	.750	.000	.542	.000	.000	.542	.000	.000	.000	.000	.375	.750	.000	.750

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Arrowhead Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 04-SBCARORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 4+ Axle Trucks

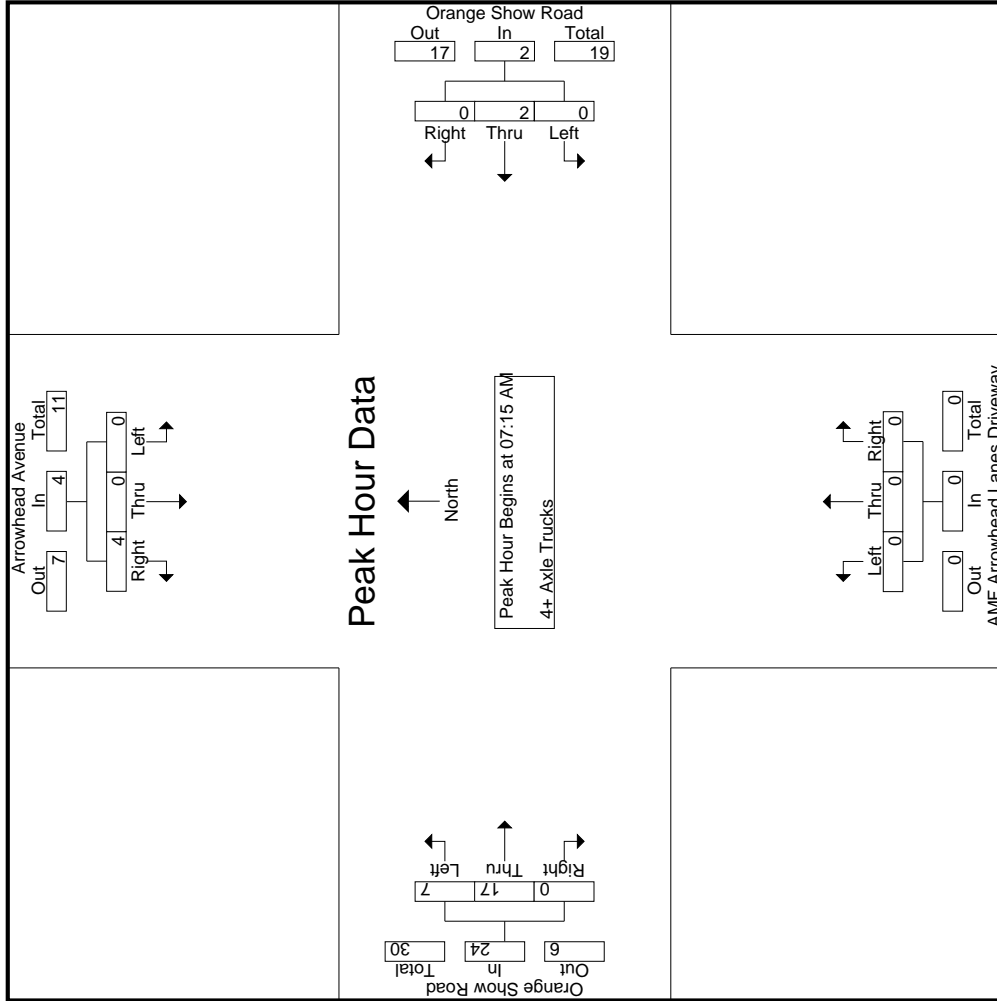
Start Time	Arrowhead Avenue Southbound					Orange Show Road Westbound					AMF Arrowhead Lanes Driveway Northbound					Orange Show Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	1	1	1	0	1	0	0	1	0	0	0	0	0	0	0	2	0	2	1	4	5
07:15 AM	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	1	4	0	0	5	0	7	7
07:30 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2	5	0	0	7	0	8	8
07:45 AM	0	0	2	1	2	0	1	0	0	1	0	0	0	0	0	2	3	0	0	5	1	8	9
Total	0	0	5	2	5	0	3	0	0	3	0	0	0	0	0	5	14	0	0	19	2	27	29
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	5	0	0	7	0	7	7
08:15 AM	0	0	4	0	4	0	1	0	0	1	0	0	0	0	0	0	9	0	0	9	0	14	14
08:30 AM	0	0	4	0	4	0	1	1	0	2	0	0	0	0	1	5	0	0	6	6	0	12	12
08:45 AM	0	0	1	0	1	0	4	1	0	5	0	0	0	0	4	3	1	0	8	8	0	14	14
Total	0	0	9	0	9	0	6	2	0	8	0	0	0	0	7	22	1	0	30	30	0	47	47
Grand Total	0	0	14	2	14	0	9	2	0	11	0	0	0	0	12	36	1	0	49	49	2	74	76
Approach %	0	0	100		18.9	0	81.8	18.2		14.9	0	0	0	0	24.5	73.5	2		66.2	66.2	2.6	97.4	
Total %	0	0	18.9		18.9	0	12.2	2.7		14.9	0	0	0	0	16.2	48.6	1.4						

Start Time	Arrowhead Avenue Southbound					Orange Show Road Westbound					AMF Arrowhead Lanes Driveway Northbound					Orange Show Road Eastbound					
	Left	Thru	Right	App. Total	Int. Total	Left	Thru	Right	App. Total	Int. Total	Left	Thru	Right	App. Total	Int. Total	Left	Thru	Right	App. Total	Int. Total	
07:15 AM	0	0	1	1	1	0	1	0	1	1	0	0	0	0	0	1	4	0	0	5	7
07:30 AM	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	2	5	0	0	7	8
07:45 AM	0	0	2	2	2	0	0	1	0	0	0	0	0	0	0	2	3	0	0	5	8
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	5	0	0	7	7
Total Volume	0	0	4	4	4	0	0	2	0	2	0	0	0	0	7	17	0	0	24	30	
% App. Total	0	0	100		.500	0	100	0		.500	0	0	0		.875	.850	0		.938		
PHF	.000	.000	.500		.500	.000	.500	.000		.000	.000	.000	.000		.850	.000	.000		.938		

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Arrowhead Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 04-SBCARORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
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City of San Bernardino
 N/S: Arrowhead Avenue
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File Name : 04-SBCARORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Arrowhead Avenue Southbound			Orange Show Road Westbound			AMF Arrowhead Lanes Driveway Northbound			Orange Show Road Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	07:15 AM													
+0 mins.	0	0	1	0	1	0	0	0	0	0	0	0	0	5
+15 mins.	0	0	1	0	0	0	0	0	0	2	5	0	0	7
+30 mins.	0	0	2	0	1	0	0	0	0	2	3	0	0	5
+45 mins.	0	0	0	0	0	0	0	0	0	2	5	0	0	7
Total Volume	0	0	4	0	2	0	0	0	0	7	17	0	0	24
% App. Total	0	0	100	0	100	0	0	0	0	29.2	70.8	0	0	
PHF	.000	.000	.500	.000	.500	.000	.000	.000	.000	.875	.850	.000	.000	.857

Counts Unlimited
 PO Box 1178
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 (951) 268-6268

City of San Bernardino
 N/S: Arrowhead Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 04-SBCARORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	Arrowhead Avenue Southbound					Orange Show Road Westbound					AMF Arrowhead Lanes Driveway Northbound					Orange Show Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	44	3	102	12	149	2	147	34	16	183	0	0	9	5	9	67	189	1	0	257	33	598	631
04:15 PM	49	2	93	19	144	8	130	32	10	170	0	0	4	3	4	65	215	2	0	282	32	600	632
04:30 PM	45	0	125	10	170	1	168	38	11	207	1	2	11	9	14	67	253	1	0	321	30	712	742
04:45 PM	47	0	101	12	148	2	124	35	16	161	8	1	10	4	19	64	212	0	0	276	32	604	636
Total	185	5	421	53	611	13	569	139	53	721	9	3	34	21	46	263	869	4	0	1136	127	2514	2641
05:00 PM	44	0	135	29	179	1	145	28	10	174	8	5	9	5	22	58	223	1	0	282	44	657	701
05:15 PM	46	2	97	13	145	6	152	33	11	191	3	0	5	4	8	75	242	2	0	319	28	663	691
05:30 PM	30	5	91	7	126	5	141	27	9	173	4	0	5	0	9	83	275	3	0	361	16	669	685
05:45 PM	35	3	68	14	106	10	103	29	12	142	0	0	6	4	6	73	233	1	0	307	30	561	591
Total	155	10	391	63	556	22	541	117	42	680	15	5	25	13	45	289	973	7	0	1269	118	2550	2668
Grand Total	340	15	812	116	1167	35	1110	256	95	1401	24	8	59	34	91	552	1842	11	0	2405	245	5064	5309
Approach %	29.1	1.3	69.6			2.5	79.2	18.3			26.4	8.8	64.8			23	76.6	0.5			4.6	95.4	
Total %	6.7	0.3	16		23	0.7	21.9	5.1		27.7	0.5	0.2	1.2		1.8	10.9	36.4	0.2		47.5			
Passenger Vehicles	335	15	766		1231	34	1051	248		1427	24	7	57		121	526	1728	11		2265	0	0	5044
% Passenger Vehicles	98.5	100	94.3		99.1	97.1	94.7	96.9		98.9	100	87.5	96.6		97.1	96.8	93.8	100		94.2	0	0	95
Large 2 Axle Vehicles	4	0	32		37	1	22	3		27	0	1	1		2	12	45	0		57	0	0	123
% Large 2 Axle Vehicles	1.2	0	3.9		2.9	2.9	2	1.2		1.8	0	12.5	1.7		0	2.2	2.4	0		2.4	0	0	2.3
3 Axle Vehicles	0	0	3		3	0	13	3		16	0	0	0		0	6	21	0		27	0	0	46
% 3 Axle Vehicles	0	0	0.4		0.2	0	1.2	1.2		1.1	0	0	0		0	1.1	1.1	0		1.1	0	0	0.9
4+ Axle Trucks	1	0	11		12	0	24	2		26	0	0	1		2	8	48	0		56	0	0	96
% 4+ Axle Trucks	0.3	0	1.4		0.9	0	2.2	0.8		1.7	0	0	1.7		2.9	1.4	2.6	0		2.3	0	0	1.8

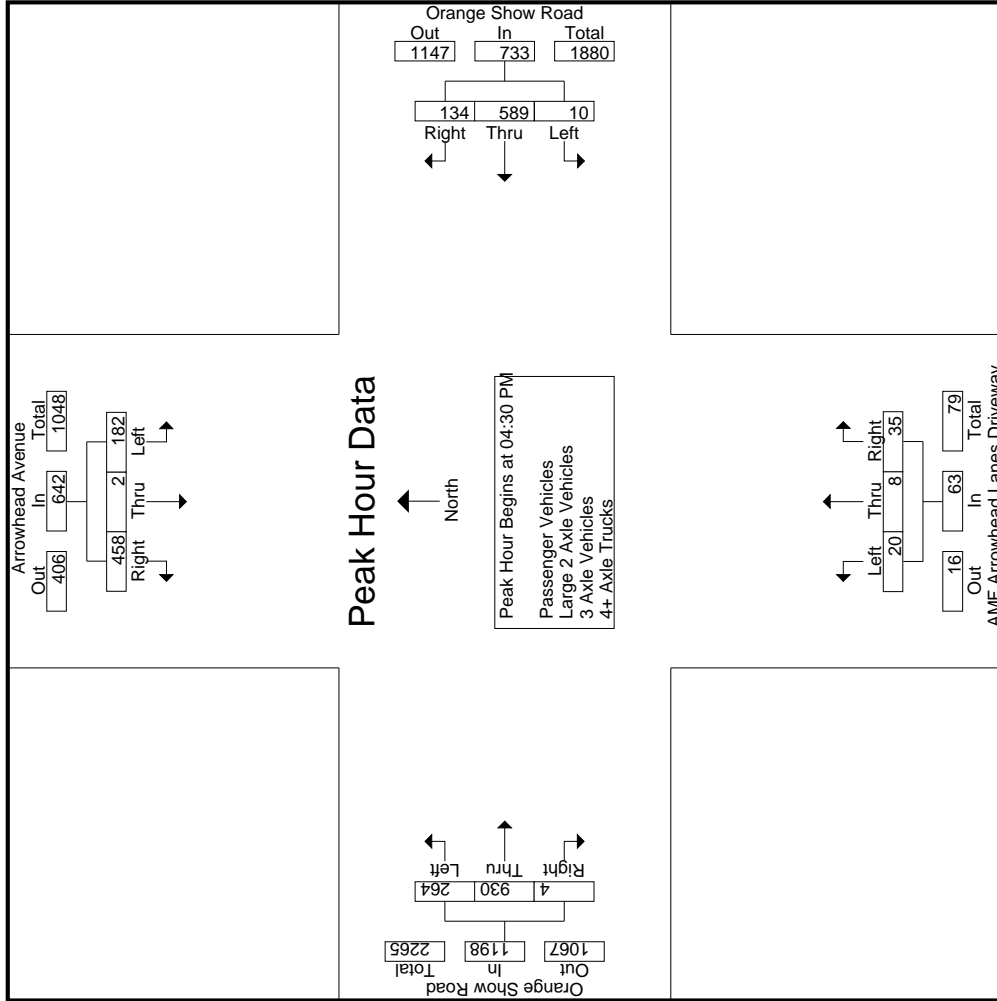
Start Time	Arrowhead Avenue Southbound					Orange Show Road Westbound					AMF Arrowhead Lanes Driveway Northbound					Orange Show Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:30 PM	45	0	125		170	1	168	38		207	1	2	11		14	67	253	1		321	1	321	712
04:45 PM	47	0	101		148	2	124	35		161	8	1	10		19	64	212	0		276	0	276	604
05:00 PM	44	0	135		179	1	145	28		174	8	5	9		22	58	223	1		282	1	282	657
05:15 PM	46	2	97		145	6	152	33		191	3	0	5		8	75	242	2		319	2	319	663
Total Volume	182	2	458		642	10	589	134		733	20	8	35		63	264	930	4		1198	4	1198	2636
% App. Total	28.3	0.3	71.3		71.3	1.4	80.4	18.3		18.3	31.7	12.7	55.6		0.3	22	77.6	0.3					
PHF	.968	.250	.848		.897	.417	.876	.882		.885	.625	.400	.795		.716	.880	.919	.500		.933			.926

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:30 PM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
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City of San Bernardino
 N/S: Arrowhead Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 04-SBCARORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



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 (951) 268-6268

City of San Bernardino
 N/S: Arrowhead Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 04-SBCARORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Arrowhead Avenue Southbound			Orange Show Road Westbound			AMF Arrowhead Lanes Driveway Northbound			Orange Show Road Eastbound						
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total		
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																
Peak Hour for Each Approach Begins at:																
	04:30 PM												04:30 PM		05:00 PM	
+0 mins.	45	0	125	170	1	168	38	207	1	2	11	14	58	223	1	282
+15 mins.	47	0	101	148	2	124	35	161	8	1	10	19	75	242	2	319
+30 mins.	44	0	135	179	1	145	28	174	8	5	9	22	83	275	3	361
+45 mins.	46	2	97	145	6	152	33	191	3	0	5	8	73	233	1	307
Total Volume	182	2	458	642	10	589	134	733	20	8	35	63	289	973	7	1269
% App. Total	28.3	0.3	71.3	89.7	1.4	80.4	18.3	31.7	12.7	55.6	22.8	76.7	22.8	76.7	0.6	87.9
PHF	.968	.250	.848	.897	.417	.876	.882	.885	.625	.400	.795	.716	.870	.885	.583	.879

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City of San Bernardino
 N/S: Arrowhead Avenue
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File Name : 04-SBCARORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles

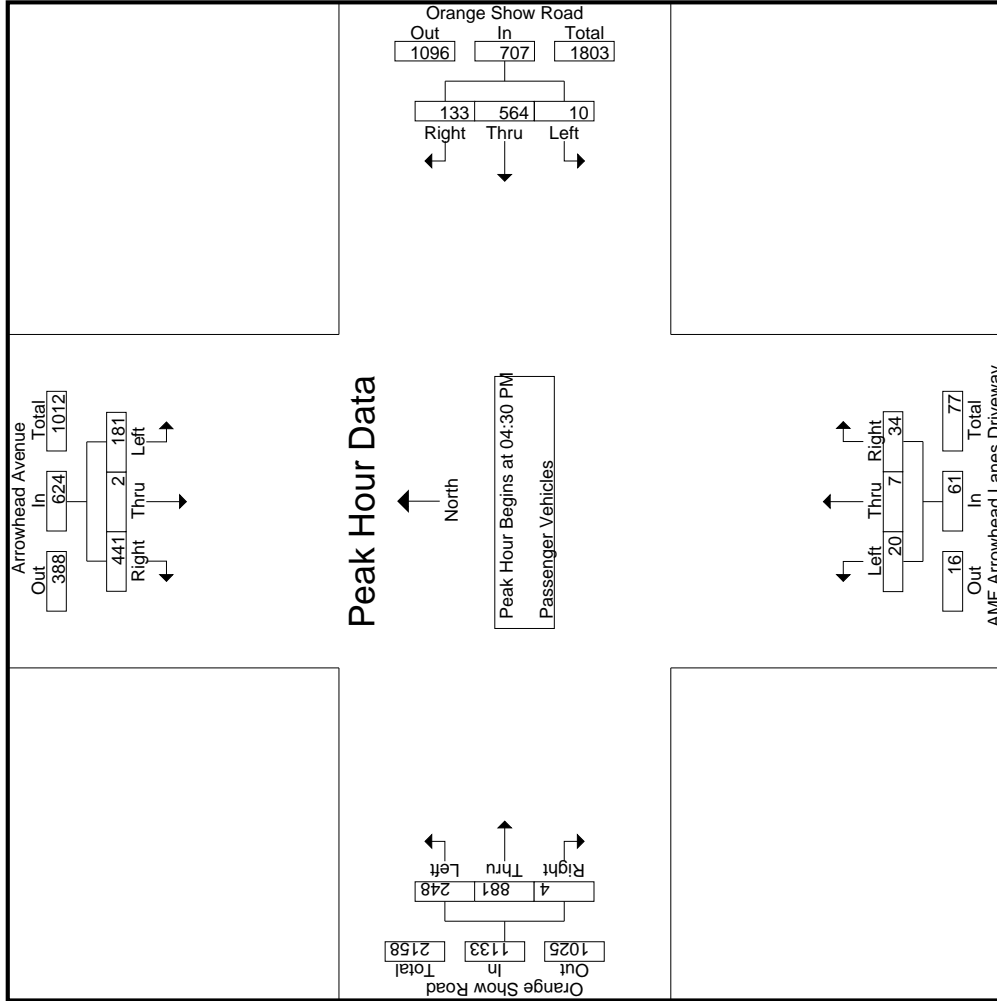
Start Time	Arrowhead Avenue Southbound					Orange Show Road Westbound					AMF Arrowhead Lanes Driveway Northbound					Orange Show Road Eastbound								
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
04:00 PM	42	3	90	12	135	1	137	32	16	170	0	0	9	5	9	65	172	1	0	238	33	552	585	
04:15 PM	48	2	80	18	130	8	117	31	10	156	0	0	3	3	3	64	193	2	0	259	31	548	579	
04:30 PM	45	0	120	10	165	1	161	37	11	199	1	1	10	8	12	65	240	1	0	306	29	682	711	
04:45 PM	47	0	98	12	145	2	112	35	16	149	8	1	10	4	19	58	200	0	0	258	32	571	603	
Total	182	5	388	52	575	12	527	135	53	674	9	2	32	20	43	252	805	4	0	1061	125	2353	2478	
05:00 PM	43	0	130	29	173	1	140	28	10	169	8	5	9	5	22	54	210	1	0	265	44	629	673	
05:15 PM	46	2	93	13	141	6	151	33	11	190	3	0	5	4	8	71	231	2	0	304	28	643	671	
05:30 PM	29	5	88	7	122	5	138	25	8	168	4	0	5	0	9	81	262	3	0	346	15	645	660	
05:45 PM	35	3	67	14	105	10	95	27	12	132	0	0	6	4	6	68	220	1	0	289	30	532	562	
Total	153	10	378	63	541	22	524	113	41	659	15	5	25	13	45	274	923	7	0	1204	117	2449	2566	
Grand Total	335	15	766	115	1116	34	1051	248	94	1333	24	7	57	33	88	526	1728	11	0	2265	242	4802	5044	
Approach %	30	1.3	68.6		23.2	2.6	78.8	18.6		27.8	0.5	0.1	1.2		1.8	23.2	76.3	0.5		47.2	4.8	95.2		
Total %	7	0.3	16			0.7	21.9	5.2								11	36	0.2						

Start Time	Arrowhead Avenue Southbound					Orange Show Road Westbound					AMF Arrowhead Lanes Driveway Northbound					Orange Show Road Eastbound								
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
04:30 PM	45	0	120		165	1	161	37		37	1	1	10		10	12	240	1		306		306	682	
04:45 PM	47	0	98		145	2	112	35		35	8	1	10		10	19	200	0		258		258	571	
05:00 PM	43	0	130		173	1	140	28		28	8	5	9		9	22	210	1		265		265	629	
05:15 PM	46	2	93		141	6	151	33		33	3	0	5		5	8	231	2		304		304	643	
Total Volume	181	2	441		624	10	564	133		133	20	7	34		34	61	881	4		1133		1133	2525	
% App. Total	29	0.3	70.7		23.2	1.4	79.8	18.8		18.8	32.8	11.5	55.7		55.7	21.9	77.8	0.4						
PHF	.963	.250	.848		.902	.417	.876	.899		.899	.888	.625	.850		.850	.693	.918	.500						.926

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Arrowhead Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 04-SBCARORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
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 (951) 268-6268

City of San Bernardino
 N/S: Arrowhead Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 04-SBCARORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Arrowhead Avenue Southbound			Orange Show Road Westbound			AMF Arrowhead Lanes Driveway Northbound			Orange Show Road Eastbound				
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	04:30 PM													
+0 mins.	45	0	120	1	161	37	199	1	10	12	65	240	1	306
+15 mins.	47	0	98	2	112	35	149	8	10	19	58	200	0	258
+30 mins.	43	0	130	1	140	28	169	8	9	22	54	210	1	265
+45 mins.	46	2	93	6	151	33	190	3	5	8	71	231	2	304
Total Volume	181	2	441	10	564	133	707	20	34	61	248	881	4	1133
% App. Total	29	0.3	70.7	1.4	79.8	18.8	32.8	11.5	55.7	21.9	77.8	77.8	0.4	
PHF	.963	.250	.848	.417	.876	.899	.888	.625	.850	.693	.873	.918	.500	.926

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 PO Box 1178
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City of San Bernardino
 N/S: Arrowhead Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 04-SBCARORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Large 2 Axle Vehicles

Start Time	Arrowhead Avenue Southbound				Orange Show Road Westbound				AMF Arrowhead Lanes Driveway Northbound				Orange Show Road Eastbound			
	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR
04:00 PM	2	0	9	0	1	8	0	0	0	0	0	0	2	5	0	0
04:15 PM	1	0	11	1	0	5	0	0	0	0	1	0	1	5	0	0
04:30 PM	0	0	4	0	0	4	1	0	0	1	0	0	0	6	0	0
04:45 PM	0	0	2	0	0	3	0	0	0	0	0	0	4	4	0	0
Total	3	0	26	1	1	20	1	0	0	1	1	0	7	20	0	0
05:00 PM	1	0	3	0	0	1	0	0	0	0	0	0	2	8	0	0
05:15 PM	0	0	1	0	0	1	0	0	0	0	0	0	0	3	0	0
05:30 PM	0	0	1	0	0	0	1	1	0	0	0	0	1	7	0	0
05:45 PM	0	0	1	0	0	0	1	0	0	0	0	0	2	7	0	0
Total	1	0	6	0	0	2	2	1	0	0	0	0	5	25	0	0
Grand Total	4	0	32	1	1	22	3	1	0	1	1	0	12	45	0	0
Approach %	11.1	0	88.9		3.8	84.6	11.5		0	50	50		21.1	78.9	0	
Total %	3.3	0	26.4		0	18.2	2.5		0	0.8	0.8		9.9	37.2	0	
					29.8	21.5			1.7				1.6	47.1		

3.1-118

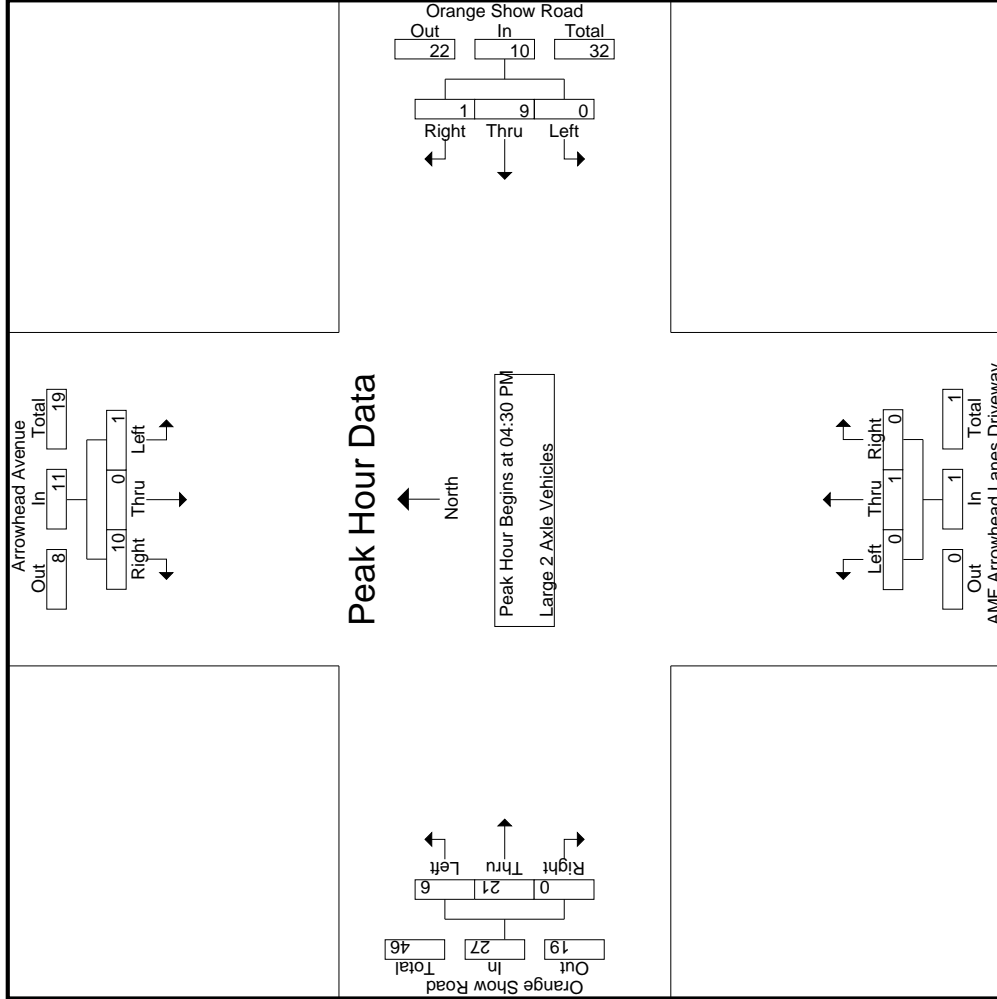
Start Time	Arrowhead Avenue Southbound				Orange Show Road Westbound				AMF Arrowhead Lanes Driveway Northbound				Orange Show Road Eastbound			
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total
04:30 PM	0	0	4	4	0	4	1	5	0	1	0	1	0	6	0	6
04:45 PM	0	0	2	2	0	3	0	3	0	0	0	0	4	4	0	8
05:00 PM	1	0	3	4	0	1	0	1	0	0	0	0	2	8	0	10
05:15 PM	0	0	1	1	0	1	0	1	0	0	0	0	0	3	0	3
Total Volume	1	0	10	11	0	9	1	10	0	1	0	1	6	21	0	27
% App. Total	9.1	0	90.9		0	90	10		0	100	0		22.2	77.8	0	
PHF	.250	.000	.625	.688	.000	.563	.250	.500	.000	.250	.000	.250	.375	.656	.000	.766

Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:30 PM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
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City of San Bernardino
 N/S: Arrowhead Avenue
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 Weather: Clear

File Name : 04-SBCARORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
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City of San Bernardino
 N/S: Arrowhead Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 04-SBCARORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Arrowhead Avenue Southbound			Orange Show Road Westbound			AMF Arrowhead Lanes Driveway Northbound			Orange Show Road Eastbound				
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1	04:30 PM													
Peak Hour for Each Approach Begins at:	04:30 PM													
+0 mins.	0	0	4	4	1	1	0	0	1	0	0	6	0	6
+15 mins.	0	0	2	3	0	0	0	0	0	4	4	0	0	8
+30 mins.	1	0	3	1	0	0	0	0	0	2	8	0	0	10
+45 mins.	0	0	1	0	0	0	0	0	0	0	3	0	0	3
Total Volume	1	0	10	11	9	1	10	1	1	6	21	0	0	27
% App. Total	9.1	0	90.9	100	90	10	100	100	100	22.2	77.8	0	0	100
PHF	.250	.000	.625	.688	.000	.563	.250	.500	.000	.375	.656	.000	.000	.675

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City of San Bernardino
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File Name : 04-SBCARORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 3 Axle Vehicles

Start Time	Arrowhead Avenue Southbound				Orange Show Road Westbound				AMF Arrowhead Lanes Driveway Northbound				Orange Show Road Eastbound											
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
04:00 PM	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	6	0	0	0	6	0	8	8
04:15 PM	0	0	1	0	1	0	2	1	0	3	0	0	0	0	0	4	0	4	0	4	0	8	8	8
04:30 PM	0	0	1	0	1	0	2	0	0	2	0	0	0	0	0	2	0	2	0	4	0	7	7	7
04:45 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	4	0	4	0	4	0	6	6	6
Total	0	0	2	0	2	0	6	3	0	9	0	0	0	0	0	16	0	18	0	18	0	29	29	29
05:00 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	1	1	0	0	2	0	6	6	6
05:15 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	0	3	3	3
05:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2	0	0	0	2	0	3	3	3
05:45 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2	1	0	0	3	0	5	5	5
Total	0	0	1	0	1	0	7	0	0	7	0	0	0	0	0	4	5	0	0	9	0	17	17	17
Grand Total	0	0	3	0	3	0	13	3	0	16	0	0	0	0	0	6	21	0	0	27	0	46	46	46
Approach %	0	0	100		6.5	0	81.2	18.8		34.8	0	0	0	0	0	22.2	77.8	0	0	58.7	0	100	100	100
Total %	0	0	6.5		6.5	0	28.3	6.5		34.8	0	13	45.7	0	0	13	45.7	0	0	58.7	0	100	100	100

3.1-121

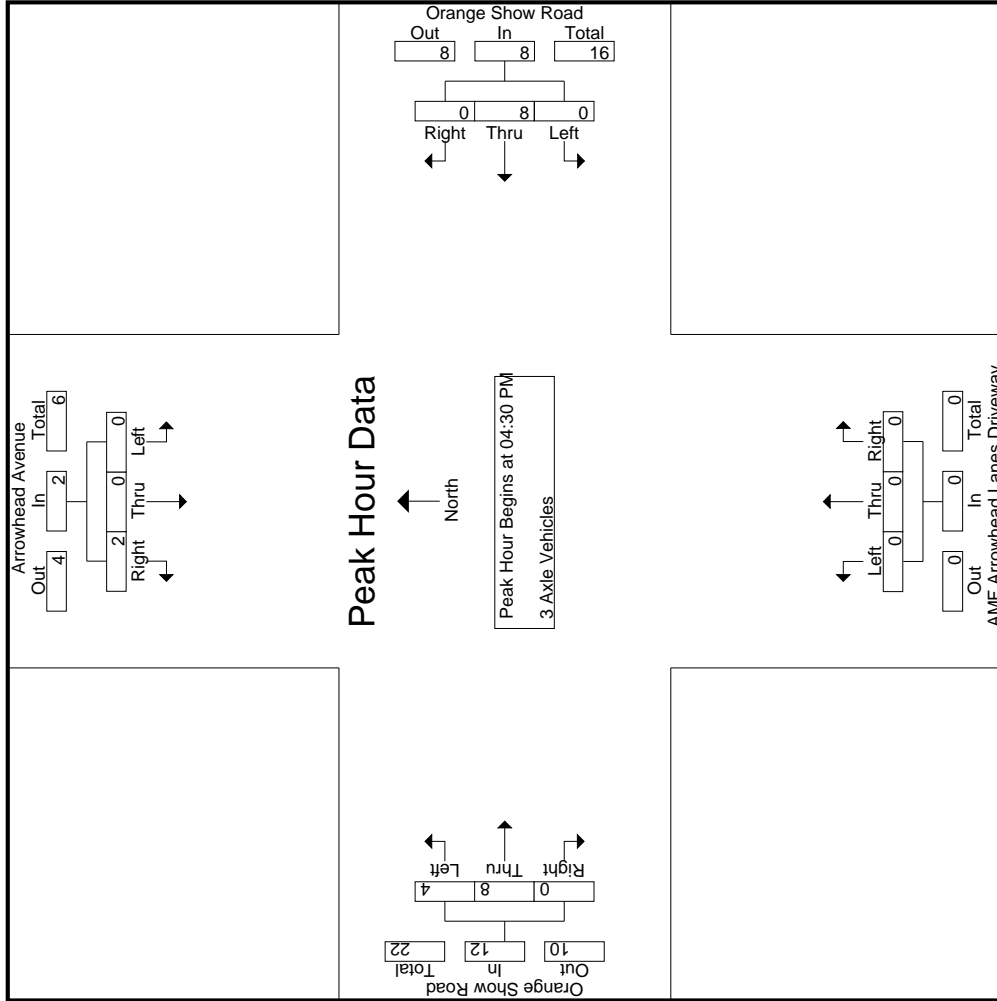
Start Time	Arrowhead Avenue Southbound				Orange Show Road Westbound				AMF Arrowhead Lanes Driveway Northbound				Orange Show Road Eastbound											
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Exclu. Total	Inclu. Total	Int. Total	
04:30 PM	0	0	1	1	0	2	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0	4	4	7
04:45 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	4	0	0	0	4	0	4	4	6
05:00 PM	0	0	0	0	0	4	0	4	0	0	0	0	0	0	0	1	1	0	0	2	0	2	2	6
05:15 PM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	0	2	2	3
Total Volume	0	0	2	2	0	8	0	8	0	0	0	0	0	4	8	0	0	0	0	12	0	12	12	22
% App. Total	0	0	100		0	100	0	100	0	0	0	0	0	33.3	66.7	0	0	0	0	66.7	0	66.7	66.7	22
PHF	.000	.000	.500	.500	.000	.500	.000	.000	.000	.000	.000	.000	.000	.500	.500	.000	.000	.000	.500	.000	.000	.750	.750	.786

Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:30 PM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Arrowhead Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 04-SBCARORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



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 (951) 268-6268

City of San Bernardino
 N/S: Arrowhead Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 04-SBCARORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Arrowhead Avenue Southbound			Orange Show Road Westbound			AMF Arrowhead Lanes Driveway Northbound			Orange Show Road Eastbound				
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	04:30 PM			04:30 PM			04:30 PM			04:30 PM				
+0 mins.	0	0	1	0	2	0	0	0	0	0	2	0	0	4
+15 mins.	0	0	0	0	2	0	0	0	0	0	4	0	0	4
+30 mins.	0	0	0	0	4	0	0	0	0	0	1	1	0	2
+45 mins.	0	0	1	0	0	0	0	0	0	1	1	0	0	2
Total Volume	0	0	2	0	8	0	0	0	0	4	8	0	0	12
% App. Total	0	0	100	0	100	0	0	0	0	33.3	66.7	0	0	
PHF	.000	.000	.500	.000	.500	.000	.000	.000	.000	.500	.500	.000	.000	.750

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Arrowhead Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 04-SBCARORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 4+ Axle Trucks

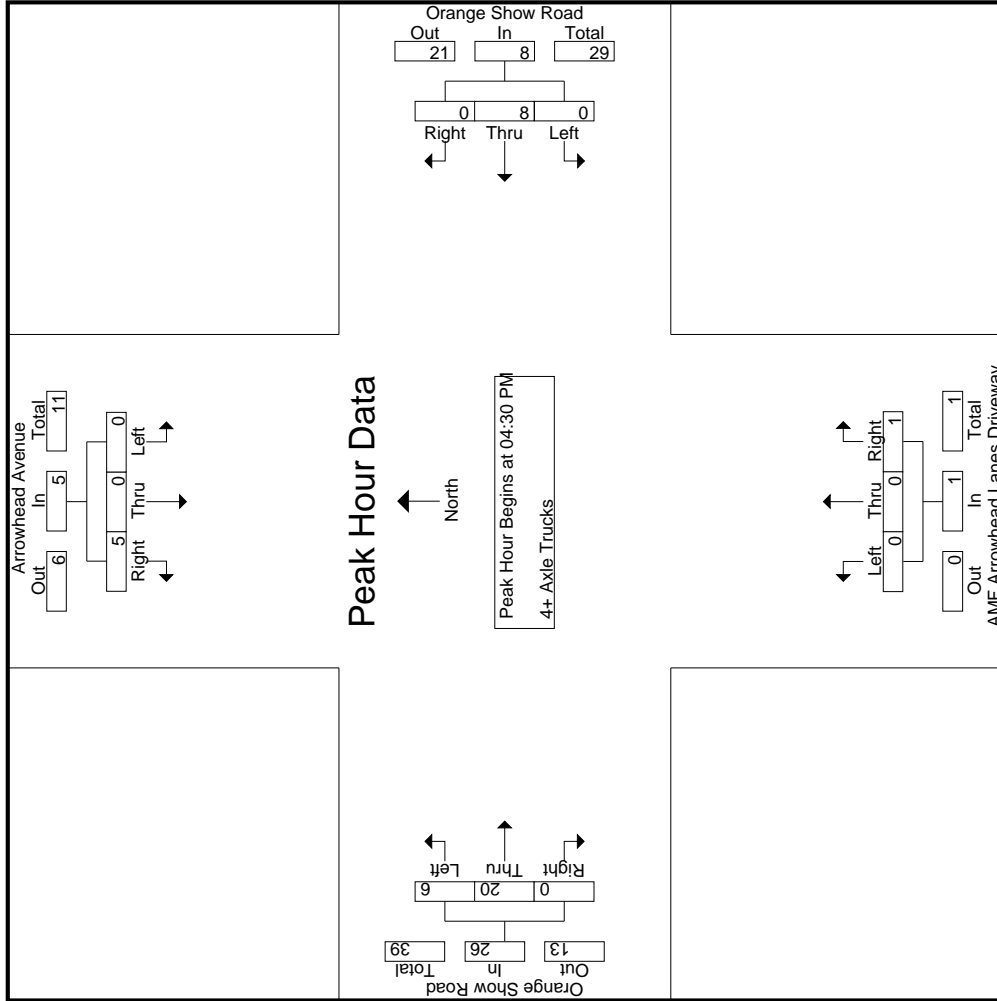
Start Time	Arrowhead Avenue Southbound					Orange Show Road Westbound					AMF Arrowhead Lanes Driveway Northbound					Orange Show Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	3	0	3	0	2	0	0	2	0	0	0	0	0	0	6	0	0	6	0	11	11
04:15 PM	0	0	1	0	1	0	6	0	0	6	0	0	0	0	0	13	0	0	13	0	20	20	
04:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	5	0	0	5	1	7	7	
04:45 PM	0	0	1	0	1	0	7	0	0	7	0	0	0	0	0	2	4	0	6	0	14	14	
Total	0	0	5	0	5	0	16	0	0	16	0	0	1	1	1	2	28	0	0	30	1	52	53
05:00 PM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	1	4	0	0	5	0	7	7
05:15 PM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	3	7	0	10	0	12	12	
05:30 PM	1	0	2	0	3	0	2	1	0	3	0	0	0	0	0	1	4	0	5	0	11	11	
05:45 PM	0	0	0	0	0	0	6	1	0	7	0	0	0	0	0	1	5	0	6	0	13	13	
Total	1	0	6	0	7	0	8	2	0	10	0	0	0	0	0	6	20	0	26	0	43	43	
Grand Total	1	0	11	0	12	0	24	2	0	26	0	0	1	1	1	8	48	0	0	56	1	95	96
Approach %	8.3	0	91.7			0	92.3	7.7			0	0	100		14.3	85.7	0		58.9	1	99		
Total %	1.1	0	11.6		12.6	0	25.3	2.1		27.4	0	0	1.1		8.4	50.5	0			1			

Start Time	Arrowhead Avenue Southbound					Orange Show Road Westbound					AMF Arrowhead Lanes Driveway Northbound					Orange Show Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:30 PM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	5	0	0	5	0	5	7
04:45 PM	0	0	1	0	1	0	7	0	0	7	0	0	0	0	0	2	4	0	0	6	0	6	14
05:00 PM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	1	4	0	0	5	0	5	7
05:15 PM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	3	7	0	0	10	0	10	12
Total Volume	0	0	5	0	5	0	8	0	0	8	0	0	0	0	1	6	20	0	0	26	0	26	40
% App. Total	0	0	100			0	100	0		100	0	0	100		23.1	76.9	0				0		
PHF	.000	.000	.625		.625	.000	.286	.000		.286	.000	.000	.250		.250	.500	.714	.000		.650		.650	.714

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Arrowhead Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 04-SBCARORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
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 (951) 268-6268

City of San Bernardino
 N/S: Arrowhead Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 04-SBCARORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Arrowhead Avenue Southbound			Orange Show Road Westbound			AMF Arrowhead Lanes Driveway Northbound			Orange Show Road Eastbound				
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	04:30 PM													
+0 mins.	0	0	0	0	1	0	0	0	1	0	0	5	0	5
+15 mins.	0	0	1	0	7	0	0	0	0	2	4	0	0	6
+30 mins.	0	0	2	0	0	0	0	0	0	1	4	0	0	5
+45 mins.	0	0	2	0	0	0	0	0	0	3	7	0	0	10
Total Volume	0	0	5	0	8	0	0	0	1	6	20	0	0	26
% App. Total	0	0	100	0	100	0	0	0	100	23.1	76.9	0	0	
PHF	.000	.000	.625	.000	.286	.000	.000	.000	.250	.500	.714	.000	.000	.650

Location: San Bernardino
 N/S: Arrowhead Avenue
 E/W: Orange Show Road



Date: 3/2/2017
 Day: Thursday

PEDESTRIANS

	North Leg Arrowhead Avenue	East Leg Orange Show Road	South Leg AMF Lanes Driveway	West Leg Orange Show Road	TOTAL
7:00 AM	0	0	0	2	2
7:15 AM	0	0	0	1	1
7:30 AM	0	0	0	1	1
7:45 AM	0	8	0	15	23
8:00 AM	0	4	0	7	11
8:15 AM	0	2	0	2	4
8:30 AM	0	0	0	4	4
8:45 AM	0	3	0	0	3
TOTAL VOLUMES:	0	17	0	32	49

	North Leg Arrowhead Avenue	East Leg Orange Show Road	South Leg AMF Lanes Driveway	West Leg Orange Show Road	TOTAL
4:00 PM	0	0	0	4	4
4:15 PM	0	0	0	3	3
4:30 PM	0	1	0	8	9
4:45 PM	0	1	0	9	10
5:00 PM	0	12	0	2	14
5:15 PM	0	1	0	4	5
5:30 PM	0	1	0	3	4
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	16	0	33	49

Location: San Bernardino
 N/S: Arrowhead Avenue
 E/W: Orange Show Road



Date: 3/2/2017
 Day: Thursday

BICYCLES

	North Leg Arrowhead Avenue	East Leg Orange Show Road	South Leg AMF Lanes Driveway	West Leg Orange Show Road	TOTAL
7:00 AM	2	0	0	0	2
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	2	0	0	0	2

	North Leg Arrowhead Avenue	East Leg Orange Show Road	South Leg AMF Lanes Driveway	West Leg Orange Show Road	TOTAL
4:00 PM	0	2	0	0	2
4:15 PM	0	0	0	1	1
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	1	1
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	2	0	2	4

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 05-SBCWAORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	Washington Avenue Southbound						Orange Show Road Westbound						Washington Avenue Northbound						Orange Show Road Eastbound						
	Left	Thru	Right	RTOR	App. Total		Left	Thru	Right	RTOR	App. Total		Left	Thru	Right	RTOR	App. Total		Left	Thru	Right	RTOR	App. Total		
	Exclu. Total	Inclu. Total	Int. Total				Exclu. Total	Inclu. Total	Int. Total				Exclu. Total	Inclu. Total	Int. Total				Exclu. Total	Inclu. Total	Int. Total				
07:00 AM	1	0	2	0	3	3	59	0	0	62	1	1	1	0	3	10	166	0	0	176	0	244	0	0	244
07:15 AM	2	1	0	1	3	1	86	1	0	88	3	0	0	0	3	10	221	2	0	233	1	327	328	0	327
07:30 AM	1	0	2	2	3	0	78	2	0	80	0	1	0	0	1	11	228	2	0	241	2	325	327	0	325
07:45 AM	0	0	2	1	2	1	80	4	0	85	0	1	0	0	1	18	245	1	0	264	1	352	353	0	352
Total	4	1	6	4	11	5	303	7	0	315	4	3	1	0	8	49	860	5	0	914	4	1248	1252	0	1248
08:00 AM	0	0	2	3	2	0	93	4	0	97	2	0	0	0	2	8	260	3	0	271	3	372	375	0	372
08:15 AM	0	0	0	1	0	1	84	3	0	88	1	2	0	0	3	5	186	2	0	193	1	284	285	0	284
08:30 AM	0	0	1	0	1	0	52	4	0	56	0	1	0	0	1	5	154	2	0	161	0	219	219	0	219
08:45 AM	0	0	2	0	2	3	88	4	0	95	1	0	0	0	1	4	148	0	0	152	0	250	250	0	250
Total	0	0	5	4	5	4	317	15	0	336	4	3	0	0	7	22	748	7	0	777	4	1125	1129	0	1125
Grand Total	4	1	11	8	16	9	620	22	0	651	8	6	1	0	15	71	1608	12	0	1691	8	2373	2381	0	2373
Approach %	25	6.2	68.8			1.4	95.2	3.4			53.3	40	6.7			4.2	95.1	0.7			0.3	99.7			
Total %	0.2	0	0.5			0.7	0.4	26.1	0.9	27.4	0.3	0.3	0		0.6	3	67.8	0.5		71.3	0	0			
Passenger Vehicles	4	1	9		22	9	559	20		588	7	3	1		11	67	1516	12		1595	0	0			0
% Passenger Vehicles	100	100	81.8	100	91.7	100	90.2	90.9	0	90.3	87.5	50	100	0	73.3	94.4	94.3	100	0	94.3	0	0			0
Large 2 Axle Vehicles	0	0	2		2	0	27	2		29	1	3	0		4	4	45	0		49	0	0			0
% Large 2 Axle Vehicles	0	0	18.2	0	8.3	0	4.4	9.1	0	4.5	12.5	50	0		26.7	5.6	2.8	0		2.9	0	0			0
3 Axle Vehicles	0	0	0		0	0	21	0		21	0	0	0		0	0	10	0		10	0	0			0
% 3 Axle Vehicles	0	0	0	0	0	0	3.4	0	0	3.2	0	0	0		0	0	0.6	0		0.6	0	0			0
4+ Axle Trucks	0	0	0		0	0	13	0		13	0	0	0		0	0	37	0		37	0	0			0
% 4+ Axle Trucks	0	0	0	0	0	0	2.1	0	0	2	0	0	0		0	0	2.3	0		2.2	0	0			0

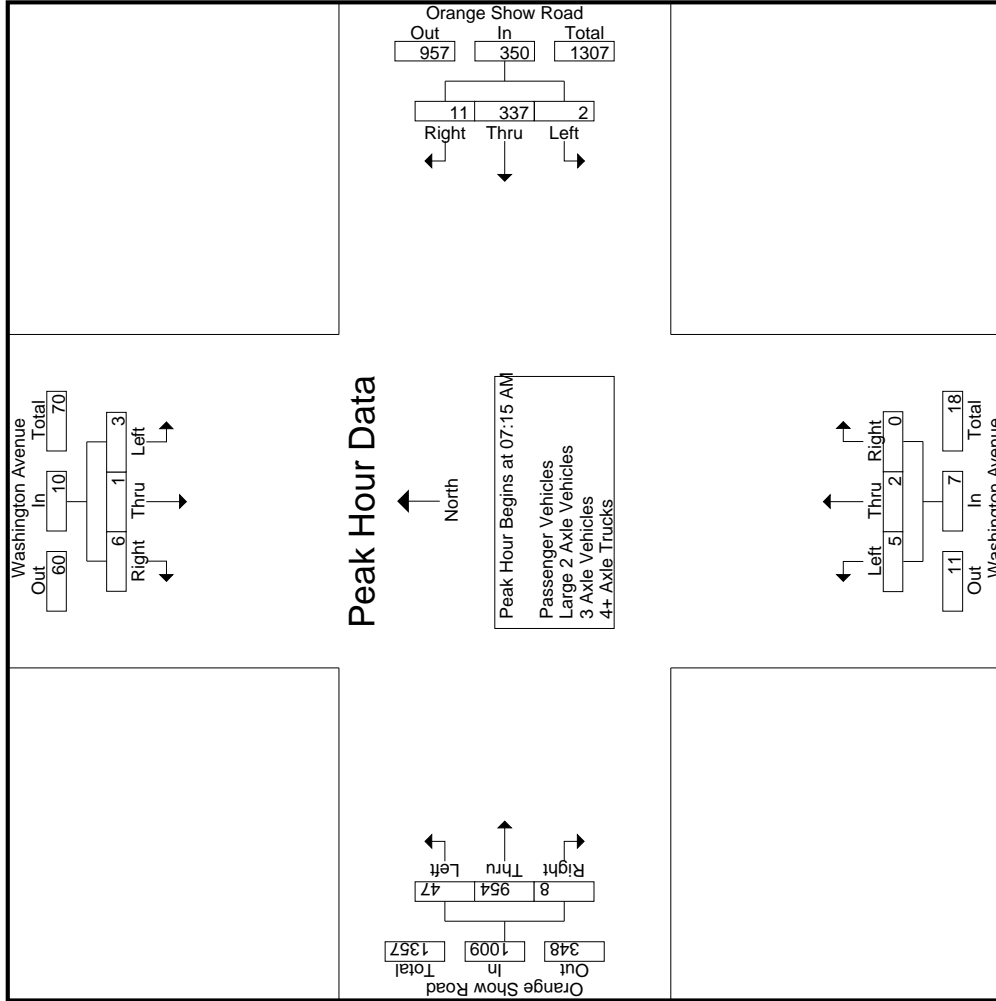
Start Time	Washington Avenue Southbound						Orange Show Road Westbound						Washington Avenue Northbound						Orange Show Road Eastbound						
	Left	Thru	Right	RTOR	App. Total		Left	Thru	Right	RTOR	App. Total		Left	Thru	Right	RTOR	App. Total		Left	Thru	Right	RTOR	App. Total		
	Exclu. Total	Inclu. Total	Int. Total				Exclu. Total	Inclu. Total	Int. Total				Exclu. Total	Inclu. Total	Int. Total				Exclu. Total	Inclu. Total	Int. Total				
07:15 AM	2	1	0		3	1	86	1		88	3	0	0		0	10	221	2		233	2	233	327		327
07:30 AM	1	0	2		3	0	78	2		80	0	1	0		1	11	228	2		241	2	241	325		325
07:45 AM	0	0	2		2	1	80	4		85	0	1	0		1	18	245	1		264	1	264	352		352
08:00 AM	0	0	2		2	0	93	4		97	2	0	0		2	8	260	3		271	3	271	372		372
Total Volume	3	1	6		10	2	337	11		350	5	2	0		7	47	954	8		1009	8	1009	1376		1376
% App. Total	30	10	60		60	0.6	96.3	3.1		3.1	71.4	28.6	0		0	4.7	94.5	0.8		0.8	0.8	0.8	1.3		1.3
PHF	.375	.250	.750		.833	.500	.906	.688		.902	.417	.500	.000		.583	.653	.917	.667		.931	.667	.931	.925		.925

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:15 AM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 05-SBCWAORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
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 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 05-SBCWAORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Washington Avenue Southbound			Orange Show Road Westbound			Washington Avenue Northbound			Orange Show Road Eastbound			App. Total	Int. Total	
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right			
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1	Peak Hour for Each Approach Begins at:														
	07:00 AM														
+0 mins.	1	0	2	1	86	1	88	1	1	1	10	221	2	233	
+15 mins.	2	1	0	0	78	2	80	3	0	0	11	228	2	241	
+30 mins.	1	0	2	1	80	4	85	0	1	0	18	245	1	264	
+45 mins.	0	0	2	0	93	4	97	0	1	0	8	260	3	271	
Total Volume	4	1	6	2	337	11	350	4	3	1	47	954	8	1009	
% App. Total	36.4	9.1	54.5	0.6	96.3	3.1	50	37.5	12.5	4.7	94.5	0.8			
PHF	.500	.250	.750	.500	.906	.688	.902	.333	.750	.250	.653	.917	.667	.931	

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
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City of San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 05-SBCWAORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles

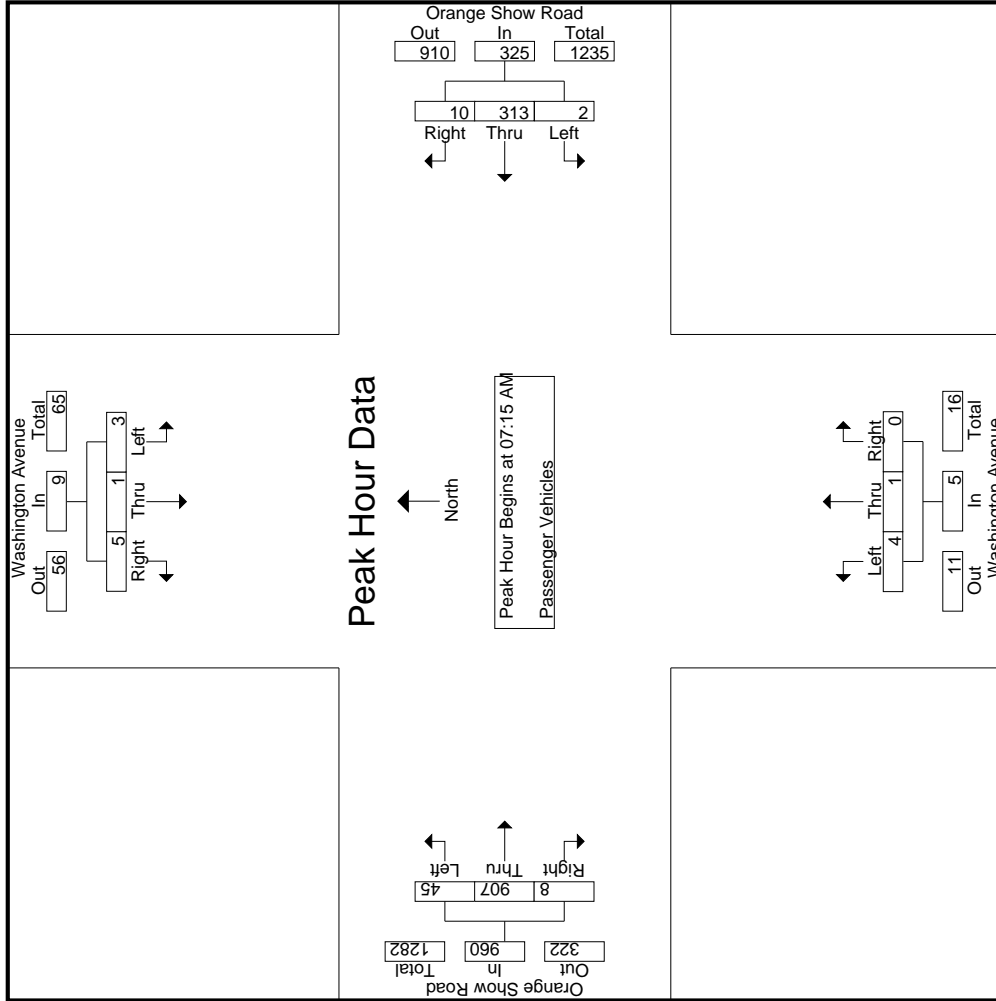
Start Time	Washington Avenue Southbound					Orange Show Road Westbound					Washington Avenue Northbound					Orange Show Road Eastbound					Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total			
07:00 AM	1	0	2	0	3	3	54	0	0	57	1	0	1	0	2	10	157	0	0	167	0	229	229
07:15 AM	2	1	0	1	3	1	77	1	0	79	2	0	0	0	2	8	212	2	0	222	1	306	307
07:30 AM	1	0	2	2	3	0	71	2	0	73	0	0	0	0	0	11	216	2	0	229	2	305	307
07:45 AM	0	0	2	1	2	1	77	4	0	82	0	1	0	0	1	18	238	1	0	257	1	342	343
Total	4	1	6	4	11	5	279	7	0	291	3	1	1	0	5	47	823	5	0	875	4	1182	1186
08:00 AM	0	0	1	3	1	0	88	3	0	91	2	0	0	0	2	8	241	3	0	252	3	346	349
08:15 AM	0	0	0	1	0	1	79	2	0	82	1	1	0	0	2	4	172	2	0	178	1	262	263
08:30 AM	0	0	1	0	1	0	44	4	0	48	0	1	0	0	1	5	141	2	0	148	0	198	198
08:45 AM	0	0	1	0	1	3	69	4	0	76	1	0	0	0	1	3	139	0	0	142	0	220	220
Total	0	0	3	4	3	4	280	13	0	297	4	2	0	0	6	20	693	7	0	720	4	1026	1030
Grand Total	4	1	9	8	14	9	559	20	0	588	7	3	1	0	11	67	1516	12	0	1595	8	2208	2216
Approach %	28.6	7.1	64.3		0.6	1.5	95.1	3.4		26.6	63.6	27.3	9.1		0.5	4.2	95	0.8		72.2	0.4	99.6	
Total %	0.2	0	0.4		0.6	0.4	25.3	0.9		26.6	0.3	0.1	0		0.5	3	68.7	0.5		72.2	0.4	99.6	

Start Time	Washington Avenue Southbound					Orange Show Road Westbound					Washington Avenue Northbound					Orange Show Road Eastbound						
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total		
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																						
Peak Hour for Entire Intersection Begins at 07:15 AM																						
07:15 AM	2	1	0	0	3	1	77	1	0	79	2	0	0	0	2	8	212	2	0	222	2	306
07:30 AM	1	0	2	2	3	0	71	2	0	73	0	0	0	0	0	11	216	2	0	229	2	305
07:45 AM	0	0	2	2	2	1	77	4	0	82	0	1	0	0	1	18	238	1	0	257	1	342
08:00 AM	0	0	1	1	1	0	88	3	0	91	2	0	0	0	2	8	241	3	0	252	3	346
Total Volume	3	1	5	5	9	2	313	10		325	4	1	0		5	45	907	8		960	8	1299
% App. Total	33.3	11.1	55.6		0.6	96.3	3.1			26.6	63.6	27.3	9.1		0.5	4.2	94.5	0.8		72.2	0.4	99.6
PHF	.375	.250	.625		.750	.500	.889	.625		.893	.500	.250	.000		.625	.625	.941	.667		.934	.934	.939

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 05-SBCWAORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 05-SBCWAORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Washington Avenue Southbound			Orange Show Road Westbound			Washington Avenue Northbound			Orange Show Road Eastbound				
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1	07:15 AM													
Peak Hour for Each Approach Begins at:	07:15 AM													
+0 mins.	2	1	0	1	77	1	79	2	0	0	8	212	2	222
+15 mins.	1	0	2	0	71	2	73	0	0	0	11	216	2	229
+30 mins.	0	0	2	1	77	4	82	0	1	0	18	238	1	257
+45 mins.	0	0	1	0	88	3	91	2	0	0	8	241	3	252
Total Volume	3	1	5	2	313	10	325	4	1	0	45	907	8	960
% App. Total	33.3	11.1	55.6	0.6	96.3	3.1	80	80	20	0	4.7	94.5	0.8	
PHF	.375	.250	.625	.500	.889	.625	.893	.500	.250	.000	.625	.941	.667	.934

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 05-SBCWAORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Large 2 Axle Vehicles

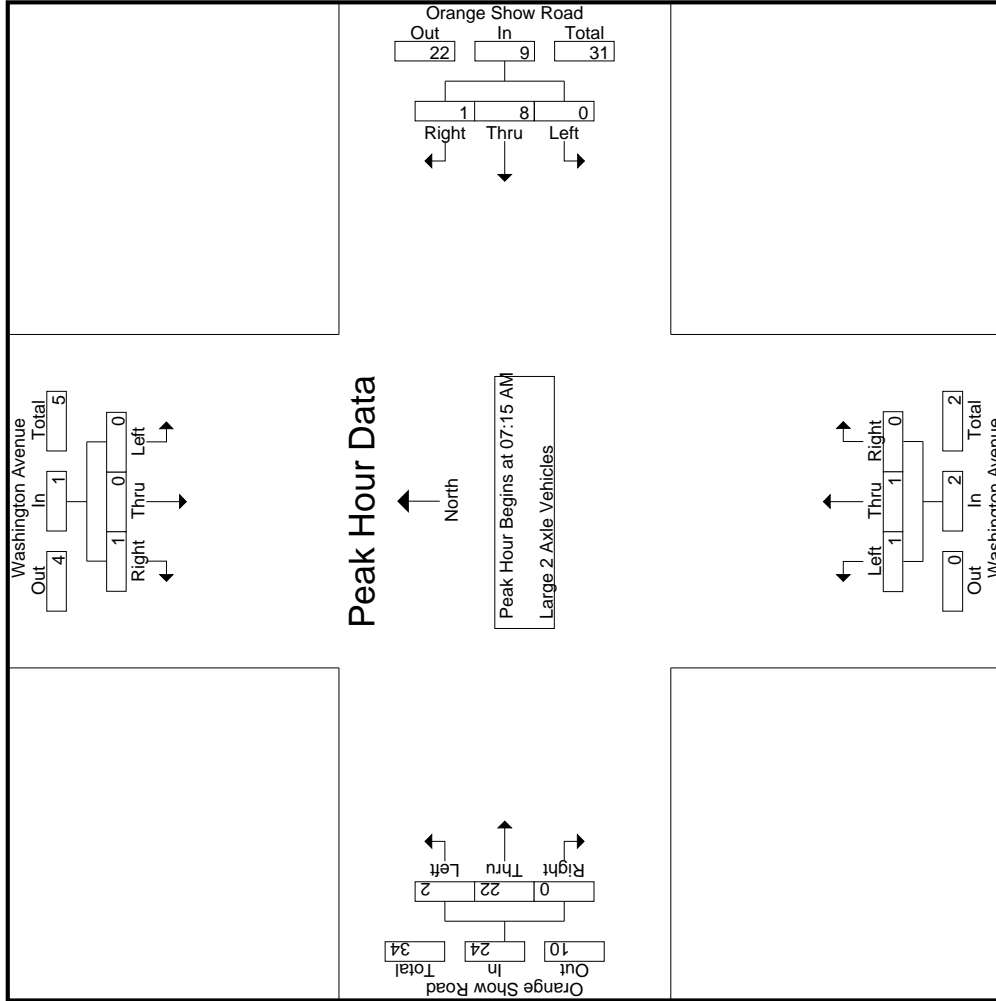
Start Time	Washington Avenue Southbound					Orange Show Road Westbound					Washington Avenue Northbound					Orange Show Road Eastbound									
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total		
07:00 AM	0	0	0	0	0	0	3	0	0	3	0	1	0	0	1	0	6	0	0	6	0	0	10	10	
07:15 AM	0	0	0	0	0	0	4	0	0	4	1	0	0	0	1	2	4	0	0	6	0	0	11	11	
07:30 AM	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	0	6	0	0	6	0	0	8	8	
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	1	
Total	0	0	0	0	0	0	8	0	0	8	1	2	0	0	3	2	17	0	0	19	0	0	30	30	
08:00 AM	0	0	1	0	1	0	3	1	0	4	0	0	0	0	0	0	11	0	0	11	0	0	16	16	
08:15 AM	0	0	0	0	0	0	1	1	0	2	0	1	0	0	1	1	4	0	0	5	0	0	8	8	
08:30 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	7	0	0	7	0	0	10	10	
08:45 AM	0	0	1	0	1	0	12	0	0	12	0	0	0	0	0	1	6	0	0	7	0	0	20	20	
Total	0	0	2	0	2	0	19	2	0	21	0	1	0	0	1	2	28	0	0	30	0	0	54	54	
Grand Total	0	0	2	0	2	0	27	2	0	29	1	3	0	0	4	4	45	0	0	49	0	0	84	84	
Approach %	0	0	100			0	93.1	6.9			25	75	0		4.8	8.2	91.8	0			0	0			
Total %	0	0	2.4		2.4	0	32.1	2.4		34.5	1.2	3.6	0		4.8	4.8	53.6	0		58.3	0	0	100		

Start Time	Washington Avenue Southbound					Orange Show Road Westbound					Washington Avenue Northbound					Orange Show Road Eastbound									
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total		
07:15 AM	0	0	0	0	0	0	4	0	0	4	1	0	0	0	1	0	1	0	0	1	2	4	0	6	6
07:30 AM	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	0	1	0	0	1	0	6	0	6	6
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
08:00 AM	0	0	1	0	1	0	3	1	0	4	0	4	0	0	4	0	0	0	0	0	0	11	0	11	11
Total Volume	0	0	1		1	0	8	1		9	1	1	1		3	2	22	0		24	0	0	24	24	
% App. Total	0	0	100		100	0	88.9	11.1		11.1	50	50	0		50	8.3	91.7	0		91.7	0	0	100	100	
PHF	.000	.000	.250		.250	.000	.500	.250		.563	.250	.250	.000		.000	.250	.500	.000		.545	.000	.545	.563	.563	

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 05-SBCWAORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 05-SBCWAORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Washington Avenue Southbound			Orange Show Road Westbound			Washington Avenue Northbound			Orange Show Road Eastbound				
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1	Peak Hour for Each Approach Begins at:													
	07:15 AM													
+0 mins.	0	0	0	0	0	0	1	0	0	0	0	0	1	2
+15 mins.	0	0	0	0	0	0	0	1	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	1	0	0	1	0	0	0	0	0	0	0	0
Total Volume	0	0	1	0	0	1	9	1	1	0	0	0	2	2
% App. Total	0	0	100	0	0	88.9	11.1	50	50	0	0	0	8.3	91.7
PHF	.000	.000	.250	.000	.000	.500	.250	.250	.250	.000	.000	.000	.250	.500
							.563						.500	.000
														.545

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 05-SBCWAORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 3 Axle Vehicles

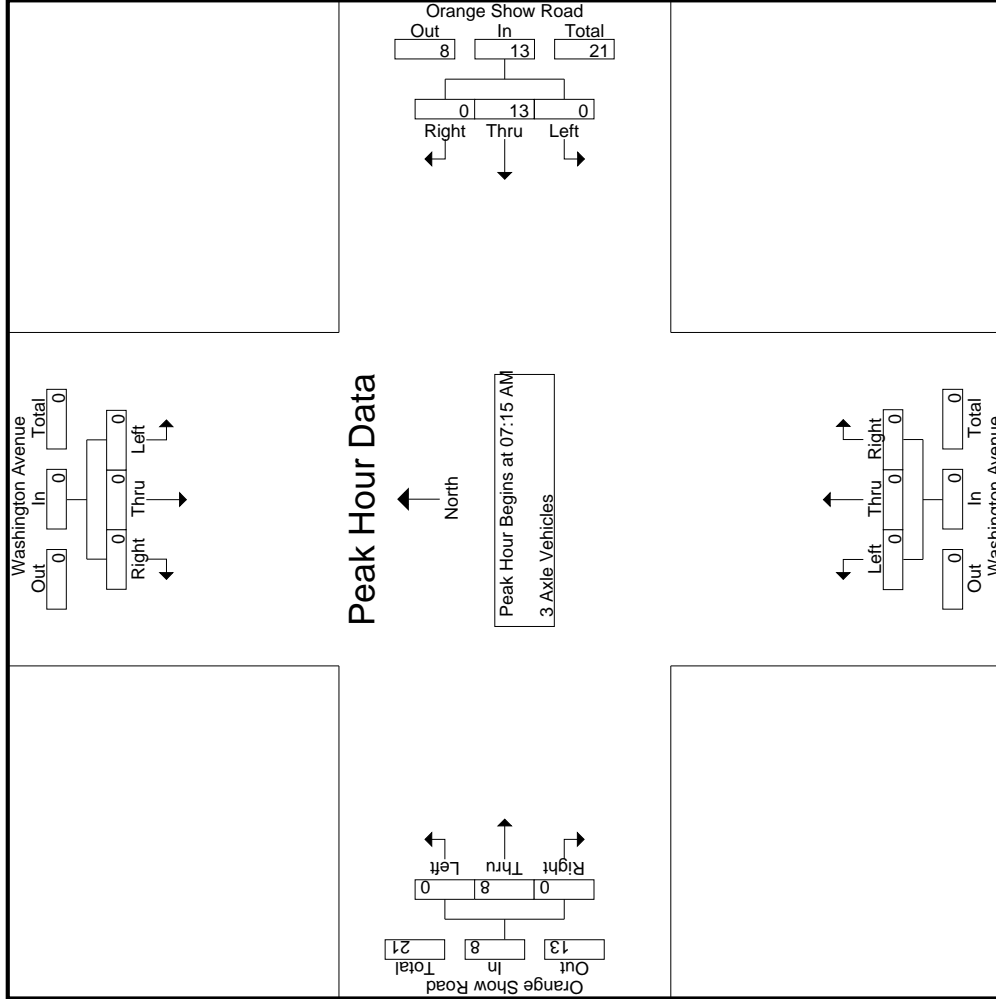
Start Time	Washington Avenue Southbound					Orange Show Road Westbound					Washington Avenue Northbound					Orange Show Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	2	2
07:15 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	0	0	4
07:30 AM	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	1	0	0	1	0	0	7
07:45 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	0	0	5
Total	0	0	0	0	0	0	12	0	0	12	0	0	0	0	0	0	6	0	0	6	0	0	18
08:00 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	0	0	5
08:15 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
08:30 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	3
08:45 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
Total	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	0	4	0	0	4	0	0	13
Grand Total	0	0	0	0	0	0	21	0	0	21	0	0	0	0	0	0	10	0	0	10	0	0	31
Approach %	0	0	0	0	0	0	100	0	0	67.7	0	0	0	0	0	0	100	0	0	32.3	0	0	100
Total %	0	0	0	0	0	0	67.7	0	0	67.7	0	0	0	0	0	0	32.3	0	0	32.3	0	0	100

Start Time	Washington Avenue Southbound					Orange Show Road Westbound					Washington Avenue Northbound					Orange Show Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:15 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	1	0	0	0	0	1	4
07:30 AM	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	1	0	0	1	0	0	7
07:45 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	0	0	5
08:00 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	0	0	5
Total Volume	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	0	8	0	0	8	0	0	21
% App. Total	0	0	0	0	0	0	100	0	0	100	0	0	0	0	0	0	100	0	0	100	0	0	100
PHF	.000	.000	.000	.000	.000	.000	.542	.000	.000	.542	.000	.000	.000	.000	.000	.000	.667	.000	.667	.000	.000	.667	.750

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 05-SBCWAORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 05-SBCWAORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Washington Avenue Southbound			Orange Show Road Westbound			Washington Avenue Northbound			Orange Show Road Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	07:15 AM													
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	1
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	1
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	3
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Total Volume	0	0	0	0	13	0	13	0	0	0	0	8	0	8
% App. Total	0	0	0	0	100	0	100	0	0	0	0	100	0	8
PHF	.000	.000	.000	.000	.542	.000	.542	.000	.000	.000	.000	.667	.000	.667

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 05-SBCWAORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 4+ Axle Trucks

Start Time	Washington Avenue Southbound				Orange Show Road Westbound				Washington Avenue Northbound				Orange Show Road Eastbound				Exclu. Total	Inclu. Total	Int. Total				
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left				Thru	Right	RTOR	App. Total
07:00 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	3
07:15 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	0	6
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0	5
07:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	4
Total	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	14	0	0	0	14	0	18	18
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0	5
08:15 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	10	0	0	0	10	0	12	12
08:30 AM	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0	8	8
08:45 AM	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	7	7
Total	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	23	0	0	0	23	0	32	32
Grand Total	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0	37	0	0	0	37	0	50	50
Approach %	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	100	0	0	0	100	0	100	100
Total %	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	74	0	0	0	74	0	100	100

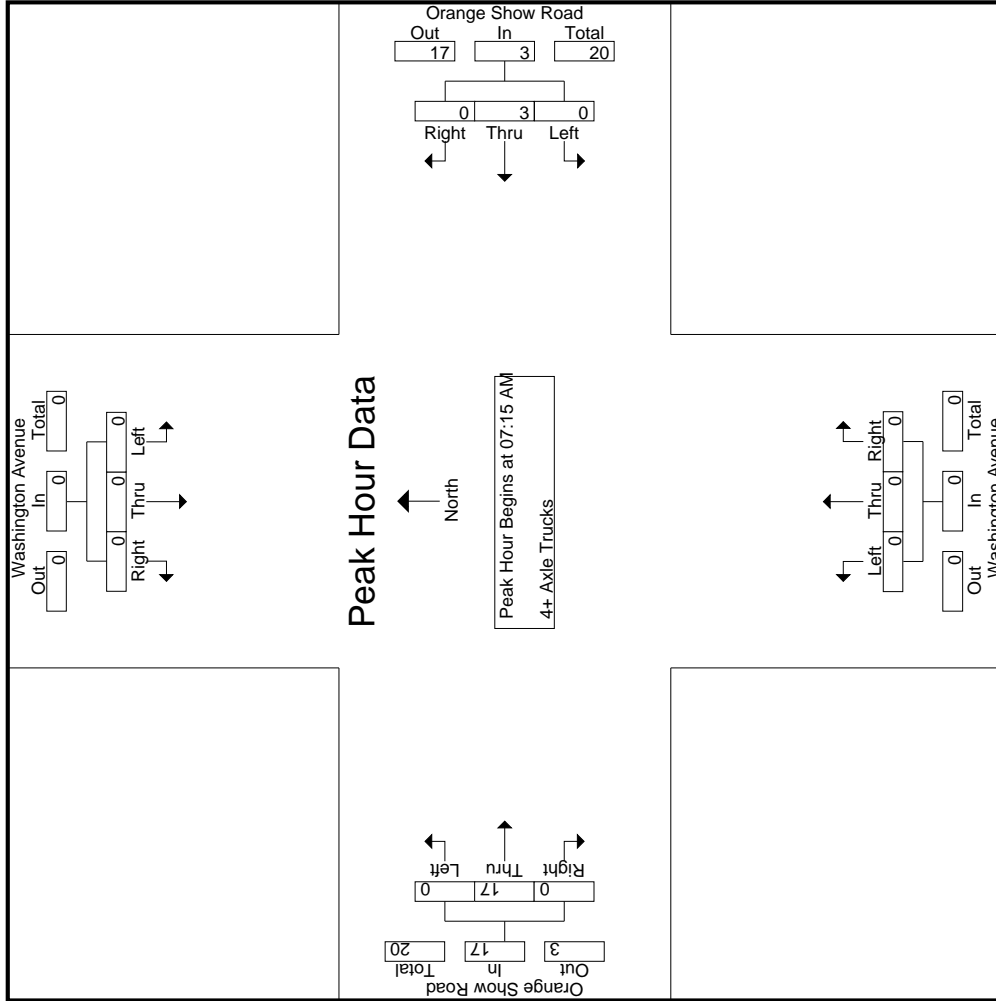
Start Time	Washington Avenue Southbound				Orange Show Road Westbound				Washington Avenue Northbound				Orange Show Road Eastbound				Exclu. Total	Inclu. Total	Int. Total				
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left				Thru	Right	RTOR	App. Total
07:15 AM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	4	0	0	0	4	0	4
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0	5
07:45 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	3
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0	5
Total Volume	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	17	0	0	0	17	0	20	20
% App. Total	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	100	0	0	0	100	0	100	100
PHF	.000	.000	.000	.000	.000	.375	.000	.375	.000	.000	.000	.000	.000	.000	.000	.850	.000	.000	.850	.000	.850	.833	.833

Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:15 AM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 05-SBCWAORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 05-SBCWAORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Washington Avenue Southbound			Orange Show Road Westbound			Washington Avenue Northbound			Orange Show Road Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	07:15 AM													
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	4
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	5
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	3
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Total Volume	0	0	0	0	3	0	0	0	0	0	0	0	17	0
% App. Total	0	0	0	0	100	0	0	0	0	0	0	0	100	0
PHF	.000	.000	.000	.000	.375	.000	.000	.000	.000	.000	.000	.000	.850	.850

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 05-SBCWAORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	Washington Avenue Southbound						Orange Show Road Westbound						Washington Avenue Northbound						Orange Show Road Eastbound					
	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total
	04:00 PM	1	0	4	2	192	2	0	196	1	0	0	0	1	6	221	5	1	232	3	434	437		
04:15 PM	1	0	1	0	3	155	1	0	159	2	0	0	0	2	4	269	0	273	0	436	436			
04:30 PM	0	1	1	1	1	186	3	0	190	7	0	2	2	9	6	316	3	325	3	526	529			
04:45 PM	1	0	5	3	3	148	1	0	152	3	0	1	1	4	11	251	4	266	4	428	432			
Total	3	1	11	6	9	681	7	0	697	13	0	3	3	16	27	1057	12	1096	10	1824	1834			
05:00 PM	0	0	4	4	0	190	3	0	193	1	2	2	1	5	8	264	2	274	5	476	481			
05:15 PM	0	0	1	1	0	171	1	0	172	2	0	0	0	2	6	312	1	319	1	494	495			
05:30 PM	0	0	5	0	5	163	1	0	165	2	0	0	0	2	7	289	1	297	0	469	469			
05:45 PM	2	1	3	1	2	132	6	1	140	4	0	0	0	4	12	271	1	284	2	434	436			
Total	2	1	13	6	3	656	11	1	670	9	2	2	1	13	33	1136	5	1174	8	1873	1881			
Grand Total	5	2	24	12	12	1337	18	1	1367	22	2	5	4	29	60	2193	17	2270	18	3697	3715			
Approach %	16.1	6.5	77.4		0.9	97.8	1.3		75.9	6.9	17.2		0.8	2.6	96.6	0.7		0.5	99.5					
Total %	0.1	0.1	0.6		0.8	36.2	0.5		0.6	0.1	0.1		0.8	1.6	59.3	0.5		61.4						
Passenger Vehicles	5	2	21	10	12	1276	17		1306	20	2	5		31	52	2081	15		0					
% Passenger Vehicles	100	100	87.5	100	93	100	94.4	100	95.5	90.9	100	100	100	93.9	86.7	94.9	88.2	100	94.6	0	0	0	3526	
Large 2 Axle Vehicles	0	0	2	2	0	22	1		23	2	0	0		2	6	42	2		0					
% Large 2 Axle Vehicles	0	0	8.3	0	4.7	0	1.6	5.6	1.7	9.1	0	0		6.1	10	1.9	11.8	0	2.2	0	0	77		
3 Axle Vehicles	0	0	1	1	0	13	0		13	0	0	0		0	1	21	0		0					
% 3 Axle Vehicles	0	0	4.2	0	2.3	0	1	0	1	0	0	0		1.7	1	0	0	1	0	0	0	2.1		
4+ Axle Trucks	0	0	0	0	0	26	0		26	0	0	0		0	1	49	0		0					
% 4+ Axle Trucks	0	0	0	0	0	1.9	0		1.9	0	0	0		1.7	2.2	0	0	2.2	0	0	0	76		

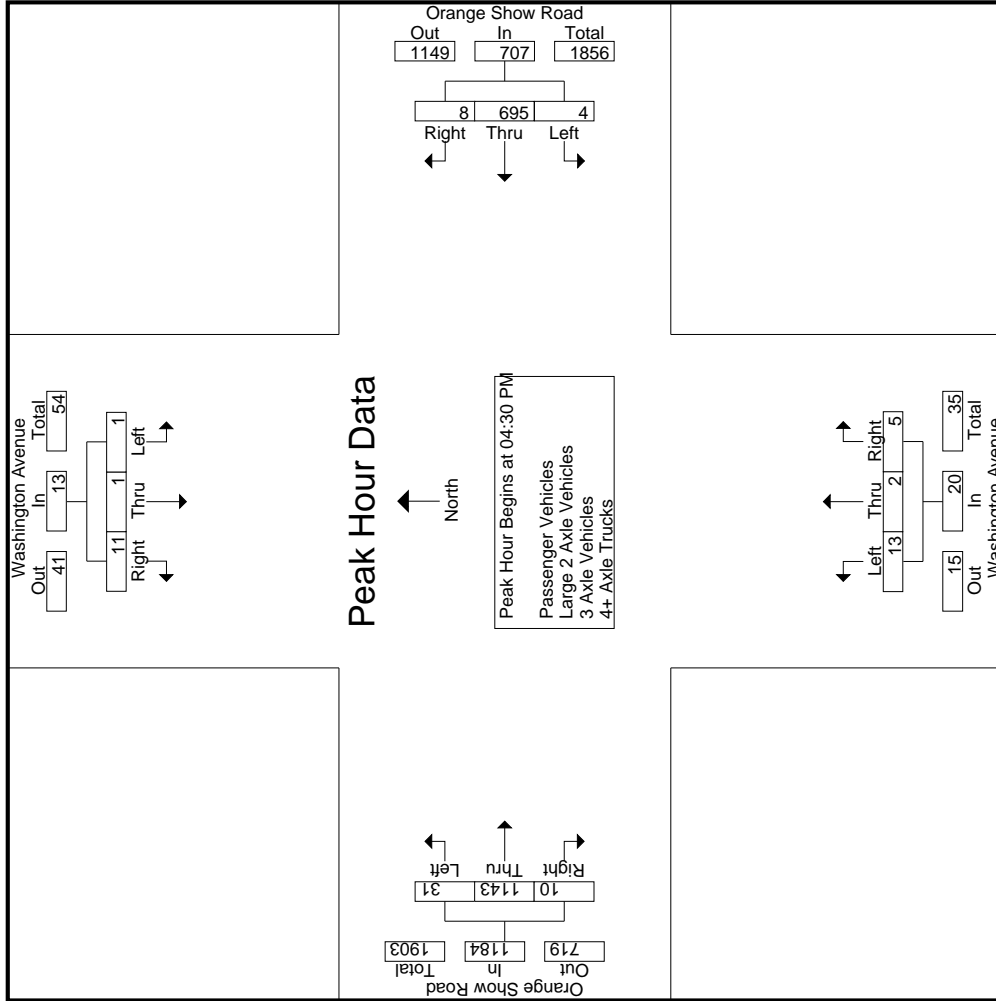
Start Time	Washington Avenue Southbound						Orange Show Road Westbound						Washington Avenue Northbound						Orange Show Road Eastbound					
	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total
	04:30 PM	0	1	1	1	2	186	3		190	7	0	0		2	9	316	3		325				
04:45 PM	1	0	5	0	3	148	1		152	3	0	1		4	4	251	4		266					
05:00 PM	0	0	4	4	0	190	3		193	1	2	2		5	8	264	2		274					
05:15 PM	0	0	1	1	0	171	1		172	2	0	0		2	6	312	1		319					
Total Volume	1	1	11	6	9	681	7		707	13	2	5		20	31	1143	10		1184					
% App. Total	7.7	7.7	84.6		0.6	98.3	1.1		91.6	65	10	25		2.6	96.5	0.8			91.1					
PHF	.250	.250	.550		.542	.333	.914		.667	.464	.250	.625		.556	.705	.625			.911					

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:30 PM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 05-SBCWAORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 05-SBCWAORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Washington Avenue Southbound			Orange Show Road Westbound			Washington Avenue Northbound			Orange Show Road Eastbound			App. Total	Int. Total		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right				
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																
Peak Hour for Each Approach Begins at:																
	04:45 PM			04:30 PM			04:15 PM			04:30 PM						
+0 mins.	1	0	5	6	1	186	3	190	2	0	0	0	6	3	325	
+15 mins.	0	0	4	4	3	148	1	152	7	0	2	0	11	4	266	
+30 mins.	0	0	1	1	0	190	3	193	3	0	1	1	8	2	274	
+45 mins.	0	0	5	5	0	171	1	172	1	2	2	2	6	1	319	
Total Volume	1	0	15	16	4	695	8	707	13	2	5	2	31	10	1184	
% App. Total	6.2	0	93.8	1.1	0.6	98.3	1.1	65	65	10	25	2.6	2.6	96.5	0.8	
PHF	.250	.000	.750	.667	.333	.914	.667	.916	.464	.250	.625	.705	.705	.904	.625	.911

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 05-SBCWAORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles

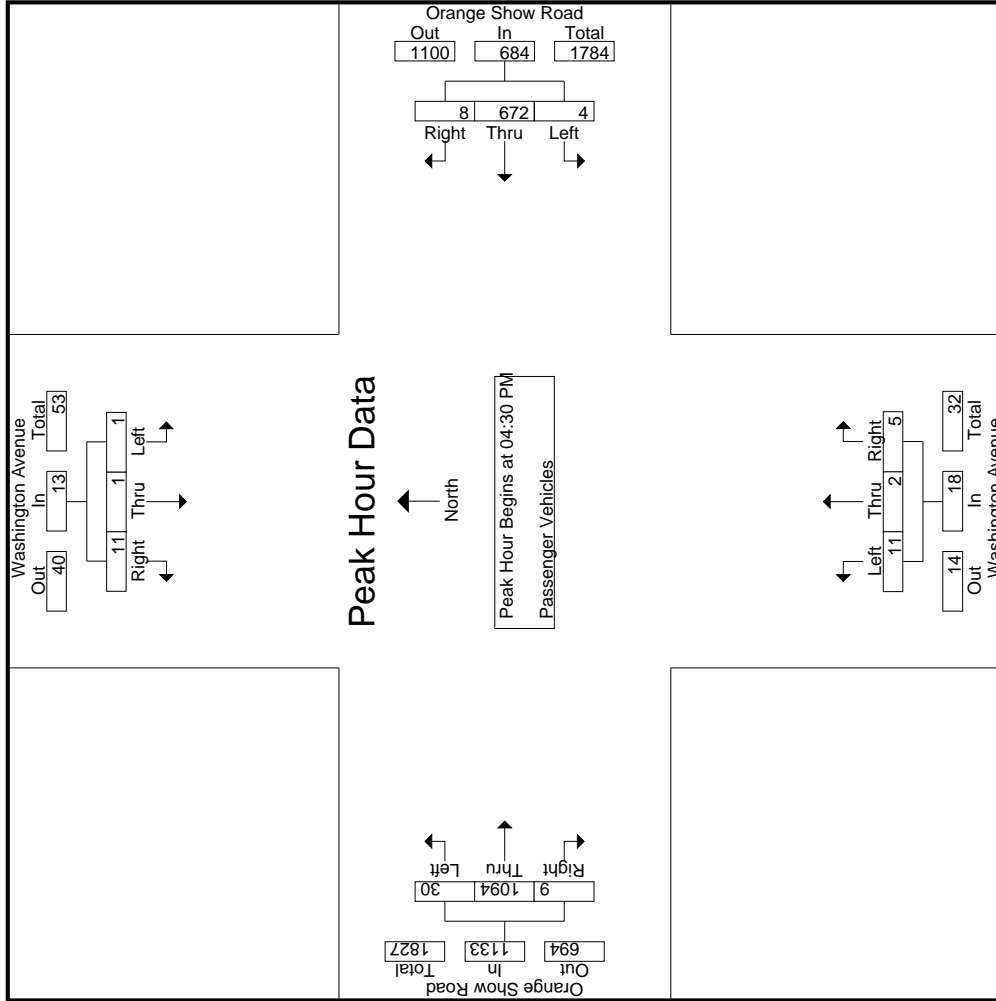
Start Time	Washington Avenue Southbound					Orange Show Road Westbound					Washington Avenue Northbound					Orange Show Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	1	0	2	2	3	2	180	1	0	183	1	0	0	0	1	3	205	4	1	212	3	399	402
04:15 PM	1	0	0	0	1	3	144	1	0	148	2	0	0	0	2	3	246	0	0	249	0	400	400
04:30 PM	0	1	1	1	2	1	181	3	0	185	5	0	2	2	7	5	303	2	0	310	3	504	507
04:45 PM	1	0	5	3	6	3	136	1	0	140	3	0	1	1	4	11	238	4	0	253	4	403	407
Total	3	1	8	6	12	9	641	6	0	656	11	0	3	3	14	22	992	10	1	1024	10	1706	1716
05:00 PM	0	0	4	4	4	0	184	3	0	187	1	2	2	1	5	8	253	2	0	263	5	459	464
05:15 PM	0	0	1	1	1	0	171	1	0	172	2	0	0	0	2	6	300	1	0	307	1	482	483
05:30 PM	0	0	5	0	5	1	157	1	0	159	2	0	0	0	2	6	276	1	0	283	0	449	449
05:45 PM	2	1	3	1	6	2	123	6	1	131	4	0	0	0	4	10	260	1	0	271	2	412	414
Total	2	1	13	6	16	3	635	11	1	649	9	2	2	1	13	30	1089	5	0	1124	8	1802	1810
Grand Total	5	2	21	12	28	12	1276	17	1	1305	20	2	5	4	27	52	2081	15	1	2148	18	3508	3526
Approach %	17.9	7.1	75		0.8	0.9	97.8	1.3		37.2	74.1	7.4	18.5		0.8	2.4	96.9	0.7		61.2	0.5	99.5	
Total %	0.1	0.1	0.6		0.8	0.3	36.4	0.5		37.2	0.6	0.1	0.1		0.8	1.5	59.3	0.4		61.2	0.5	99.5	

Start Time	Washington Avenue Southbound					Orange Show Road Westbound					Washington Avenue Northbound					Orange Show Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:30 PM	0	1	1	1	2	1	181	3	0	185	5	0	0	0	2	7	303	2	0	310	2	310	504
04:45 PM	1	0	5	0	6	3	136	1	0	140	3	0	0	1	4	4	238	4	0	253	4	253	403
05:00 PM	0	0	4	0	4	0	184	3	0	187	1	1	2	2	5	8	253	2	0	263	2	263	459
05:15 PM	0	0	1	1	1	0	171	1	0	172	2	0	0	0	2	6	300	1	0	307	1	307	482
Total Volume	1	1	11	11	13	4	672	8	0	684	11	2	5	0	18	30	1094	9	0	1133	9	1133	1848
% App. Total	7.7	7.7	84.6		0.8	0.6	98.2	1.2		37.2	61.1	11.1	27.8		0.8	2.6	96.6	0.8		61.2	0.5	99.5	
PHF	.250	.250	.550		.542	.333	.913	.667		.914	.550	.250	.625		.643	.682	.903	.563		.914		.914	.917

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 05-SBCWAORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 05-SBCWAORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Washington Avenue Southbound			Orange Show Road Westbound			Washington Avenue Northbound			Orange Show Road Eastbound				
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	04:30 PM			04:30 PM			04:30 PM			04:30 PM				
+0 mins.	0	1	1	2	1	181	3	185	0	2	5	303	2	310
+15 mins.	1	0	5	6	3	136	1	140	0	1	11	238	4	253
+30 mins.	0	0	4	4	0	184	3	187	2	2	8	253	2	263
+45 mins.	0	0	1	1	0	171	1	172	0	0	6	300	1	307
Total Volume	1	1	11	13	4	672	8	684	2	5	30	1094	9	1133
% App. Total	7.7	7.7	84.6		0.6	98.2	1.2	61.1	11.1	27.8	2.6	96.6	0.8	
PHF	.250	.250	.550	.542	.333	.913	.667	.914	.250	.625	.682	.903	.563	.914

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 05-SBCWAORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Large 2 Axle Vehicles

Start Time	Washington Avenue Southbound					Orange Show Road Westbound					Washington Avenue Northbound					Orange Show Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	1	0	1	0	9	1	0	10	0	0	0	0	0	2	5	1	0	8	0	19	19
04:15 PM	0	0	1	0	1	0	3	0	0	3	0	0	0	0	0	1	5	0	0	6	0	10	10
04:30 PM	0	0	0	0	0	0	3	0	0	3	2	0	0	0	2	0	5	1	0	6	0	11	11
04:45 PM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	5	0	0	5	0	8	8
Total	0	0	2	0	2	0	18	1	0	19	2	0	0	0	2	3	20	2	0	25	0	48	48
05:00 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	6	0	0	6	0	8	8
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	0	4	4
05:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	7	0	0	8	0	9	9
05:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2	5	0	0	7	0	8	8
Total	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	3	22	0	0	25	0	29	29
Grand Total	0	0	2	0	2	0	22	1	0	23	2	0	0	0	2	6	42	2	0	50	0	77	77
Approach %	0	0	100		2.6	0	95.7	4.3		29.9	100	0	0		2.6	12	84	4		64.9	0	100	
Total %	0	0	2.6		2.6	0	28.6	1.3		29.9	2.6	0	0		2.6	7.8	54.5	2.6		64.9	0	100	

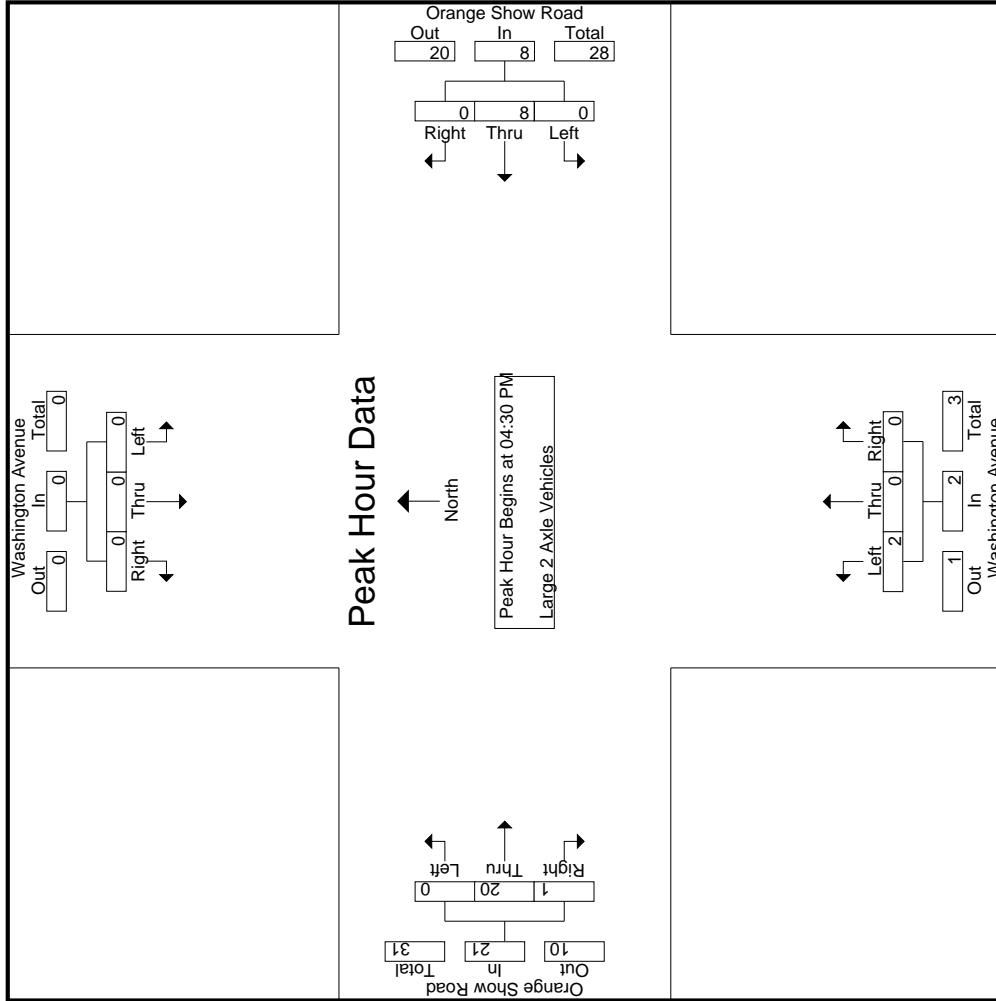
Start Time	Washington Avenue Southbound					Orange Show Road Westbound					Washington Avenue Northbound					Orange Show Road Eastbound								
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
04:30 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	2	0	0	0	2	0	1	6	11
05:00 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	5	8
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	8
Total Volume	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	2	0	0	0	2	0	20	1	31
% App. Total	0	0	0	0	0	0	100	0	0	0	100	0	0	0	0	0	95.2	4.8	0	95.2	0	4.8	21	31
PHF	.000	.000	.000	.000	.000	.000	.667	.000	.000	.000	.667	.000	.000	.000	.000	.000	.833	.250	.000	.833	.250	.875	.705	.705

Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:30 PM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 05-SBCWAORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 05-SBCWAORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Washington Avenue Southbound			Orange Show Road Westbound			Washington Avenue Northbound			Orange Show Road Eastbound					
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total	
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1															
Peak Hour for Each Approach Begins at:															
	04:30 PM			04:30 PM			04:30 PM			04:30 PM			04:30 PM		
+0 mins.	0	0	0	0	0	0	3	0	0	2	0	0	5	1	6
+15 mins.	0	0	0	0	0	0	3	0	0	0	0	0	5	0	5
+30 mins.	0	0	0	0	0	0	2	0	0	0	0	0	6	0	6
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4
Total Volume	0	0	0	0	0	0	8	0	0	2	0	0	20	1	21
% App. Total	0	0	0	0	0	0	100	0	0	100	0	0	95.2	4.8	100
PHF	.000	.000	.000	.000	.000	.000	.667	.000	.000	.250	.000	.000	.833	.250	.875

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 05-SBCWAORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 3 Axle Vehicles

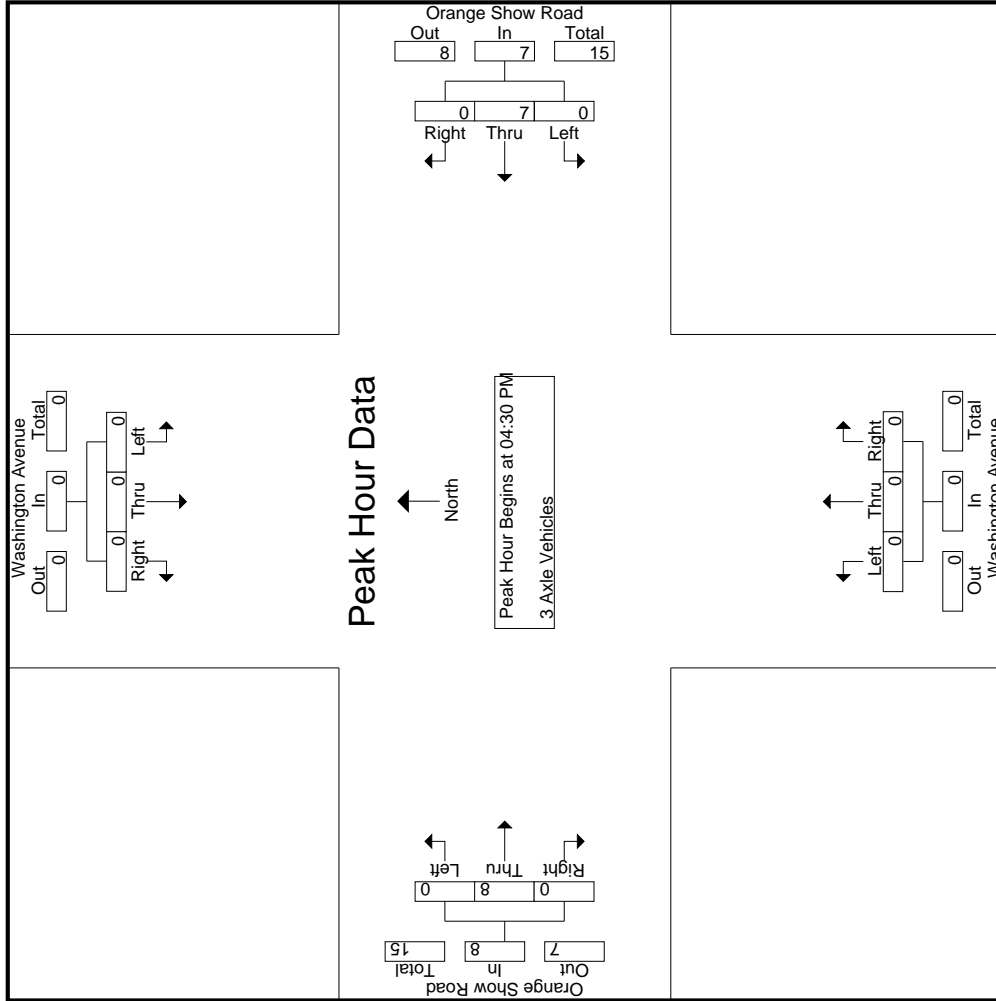
Start Time	Washington Avenue Southbound					Orange Show Road Westbound					Washington Avenue Northbound					Orange Show Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	1	6	0	0	7	0	9	9
04:15 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	0	6	6
04:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	4	4
04:45 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	0	5	5
Total	0	0	1	0	1	0	6	0	0	6	0	0	0	0	0	1	16	0	0	17	0	24	24
05:00 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	1	0	0	1	0	5	5
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	1
05:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	3	3
05:45 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	3	3
Total	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	5	0	0	5	0	12	12
Grand Total	0	0	1	0	1	0	13	0	0	13	0	0	0	0	0	1	21	0	0	22	0	36	36
Approach %	0	0	100		2.8	0	100			36.1	0	0	0		4.5	95.5	0		61.1		0	100	
Total %	0	0	2.8			0	36.1			36.1	0	0	0		2.8	58.3	0				0	100	

Start Time	Washington Avenue Southbound					Orange Show Road Westbound					Washington Avenue Northbound					Orange Show Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3	4
04:45 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	3	5
05:00 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	0	1	0	0	1	0	1	5
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Total Volume	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	8	0	0	8	0	15	15
% App. Total	0	0	0	0	0	0	100			438	0	0	0		0	100	0		667		0	.750	
PHF	.000	.000	.000		.000	.000	.438			.000	.000	.438			.000	.667	.000		.667		.000	.750	

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 05-SBCWAORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 05-SBCWAORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Washington Avenue Southbound			Orange Show Road Westbound			Washington Avenue Northbound			Orange Show Road Eastbound			App. Total	Int. Total	
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right			
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1															
Peak Hour for Each Approach Begins at:	04:30 PM														
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
+30 mins.	0	0	0	0	0	0	4	0	0	0	0	0	0	1	1
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Total Volume	0	0	0	0	0	0	7	0	0	0	0	0	0	8	8
% App. Total	0	0	0	0	0	0	100	0	0	0	0	0	0	100	0
PHF	.000	.000	.000	.000	.000	.000	.438	.000	.000	.000	.000	.000	.000	.667	.667

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 05-SBCWAORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 4+ Axle Trucks

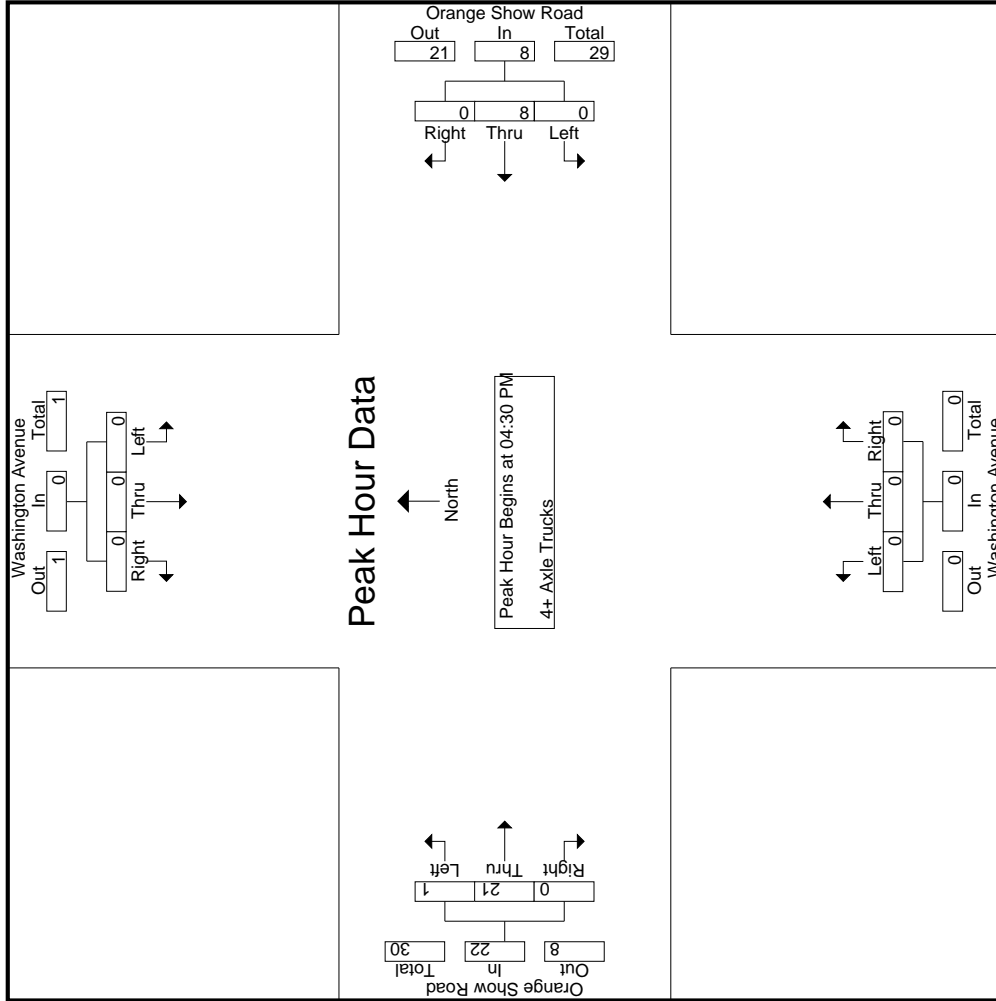
Start Time	Washington Avenue Southbound					Orange Show Road Westbound					Washington Avenue Northbound					Orange Show Road Eastbound					Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total			
04:00 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	5	0	0	5	0	7	7
04:15 PM	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	14	0	0	14	0	20	20	
04:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	5	0	0	5	0	7	7	
04:45 PM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	5	0	0	5	0	12	12	
Total	0	0	0	0	0	0	16	0	0	16	0	0	0	0	0	29	0	0	29	0	46	46	
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	0	4	4	
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	7	0	7	7	
05:30 PM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	4	0	0	4	0	8	8	
05:45 PM	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	5	0	0	5	0	11	11	
Total	0	0	0	0	0	0	10	0	0	10	0	0	0	0	0	20	0	0	20	0	30	30	
Grand Total	0	0	0	0	0	0	26	0	0	26	0	0	0	0	0	49	0	0	49	0	76	76	
Approach %	0	0	0	0	0	0	100	0	0	100	0	0	0	0	0	2	98	0	100	0	100	100	
Total %	0	0	0	0	0	0	34.2	0	0	34.2	0	0	0	0	0	1.3	64.5	0	65.8	0	100	100	

Start Time	Washington Avenue Southbound					Orange Show Road Westbound					Washington Avenue Northbound					Orange Show Road Eastbound						
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total		
04:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	5	0	0	0	6	7
04:45 PM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	5	0	0	0	5	12
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	4
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	7	7
Total Volume	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	1	21	0	0	0	22	30
% App. Total	0	0	0	0	0	0	100	0	0	100	0	0	0	0	0	4.5	95.5	0	0	0	0	30
PHF	.000	.000	.000	.000	.000	.000	.286	.000	.000	.286	.000	.000	.000	.000	.000	.250	.750	.000	.000	.786	.625	.625

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 05-SBCWAORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 05-SBCWAORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Washington Avenue Southbound			Orange Show Road Westbound			Washington Avenue Northbound			Orange Show Road Eastbound			App. Total	Int. Total			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right					
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	04:30 PM												04:30 PM	04:30 PM			
+0 mins.	0	0	0	0	1	0	0	0	0	0	0	0	1	5	0	0	6
+15 mins.	0	0	0	0	7	0	0	0	0	0	0	0	0	5	0	0	5
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	7
Total Volume	0	0	0	0	8	0	0	0	0	0	0	0	1	21	0	0	22
% App. Total	0	0	0	0	100	0	0	0	0	0	0	0	4.5	95.5	0	0	
PHF	.000	.000	.000	.000	.286	.000	.000	.000	.000	.000	.000	.000	.250	.750	.000	.000	.786

Location: San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road



Date: 3/2/2017
 Day: Thursday

PEDESTRIANS

	North Leg Washington Avenue	East Leg Orange Show Road	South Leg Washington Avenue	West Leg Orange Show Road	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	1	0	1
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	0	0	1	0	1

	North Leg Washington Avenue	East Leg Orange Show Road	South Leg Washington Avenue	West Leg Orange Show Road	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	0	0	1	0	1
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	0	1	0	1

Location: San Bernardino
 N/S: Washington Avenue
 E/W: Orange Show Road



Date: 3/2/2017
 Day: Thursday

BICYCLES

	North Leg Washington Avenue	East Leg Orange Show Road	South Leg Washington Avenue	West Leg Orange Show Road	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	1	0	0	0	1
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	1	0	1
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	1	0	1	0	2

	North Leg Washington Avenue	East Leg Orange Show Road	South Leg Washington Avenue	West Leg Orange Show Road	TOTAL
4:00 PM	0	0	2	0	2
4:15 PM	1	0	0	0	1
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	1	1	2
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	1	0	3	1	5

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 06-SBCWADUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	Washington Avenue Southbound				Dumas Street Westbound				Private Driveway Northbound				Dumas Street Eastbound			
	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR
07:00 AM	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0
07:15 AM	4	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
07:30 AM	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
07:45 AM	1	0	0	0	0	0	1	0	0	0	0	0	2	0	0	0
Total	9	0	0	0	0	1	4	0	0	0	0	0	1	0	0	0
08:00 AM	4	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
08:15 AM	2	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
08:30 AM	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
08:45 AM	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Total	10	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0
Grand Total	19	0	0	0	0	1	11	0	0	0	0	0	1	0	0	0
Approach %	100	0	0	0	0	8.3	91.7	0	0	0	0	0	100	0	0	0
Total %	59.4	0	0	0	0	3.1	34.4	0	0	0	0	0	3.1	0	0	0
Passenger Vehicles	19	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0
% Passenger Vehicles	100	0	0	0	0	0	72.7	0	0	0	0	0	0	0	0	0
Large 2 Axle Vehicles	0	0	0	0	0	1	3	0	0	0	0	0	1	0	0	0
% Large 2 Axle Vehicles	0	0	0	0	0	100	27.3	0	0	0	0	0	100	0	0	0
3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% 3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% 4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

3.1-161

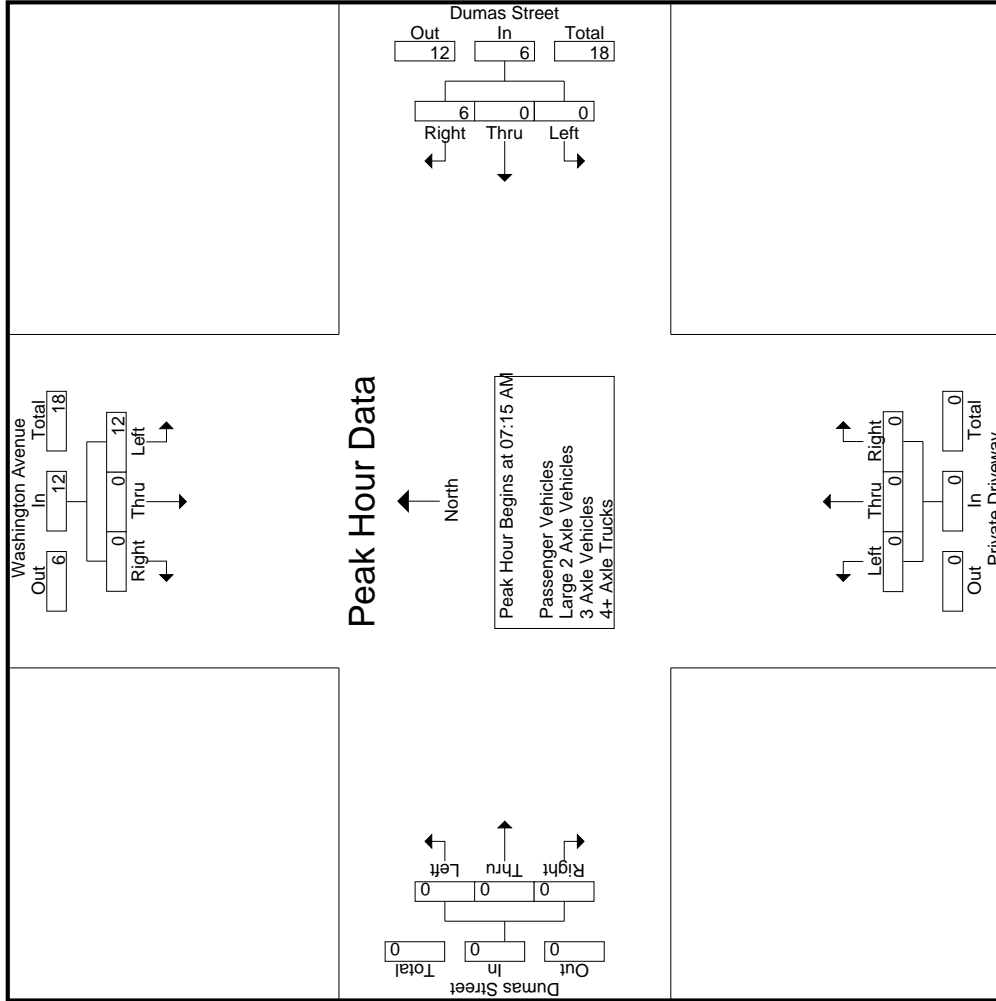
Start Time	Washington Avenue Southbound				Dumas Street Westbound				Private Driveway Northbound				Dumas Street Eastbound			
	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR
07:15 AM	4	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
07:30 AM	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
07:45 AM	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
08:00 AM	4	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
Total Volume	12	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0
% App. Total	100	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0
PHF	.750	.000	.000	.000	.750	.750	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:15 AM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 06-SBCWADUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 06-SBCWADUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Washington Avenue Southbound			Dumas Street Westbound			Private Driveway Northbound			Dumas Street Eastbound			App. Total	Int. Total																						
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right																								
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																																				
Peak Hour for Each Approach Begins at:																																				
	07:15 AM												07:30 AM												07:00 AM											
+0 mins.	4	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1												
+15 mins.	3	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0												
+30 mins.	1	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0												
+45 mins.	4	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0												
Total Volume	12	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1												
% App. Total	100	0	0	0	0	100	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100												
PHF	.750	.000	.000	.750	.000	.583	.583	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250												

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 06-SBCWADUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles

Start Time	Washington Avenue Southbound					Dumas Street Westbound					Private Driveway Northbound					Dumas Street Eastbound								
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
07:00 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
07:15 AM	4	0	0	0	4	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	5	5	5
07:30 AM	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	3
07:45 AM	1	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2	2	2
Total	9	0	0	0	9	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	11	11	11
08:00 AM	4	0	0	0	4	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	6	6	6
08:15 AM	2	0	0	0	2	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	4	4	4
08:30 AM	3	0	0	0	3	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	4	4	4
08:45 AM	1	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2	2	2
Total	10	0	0	0	10	0	0	6	0	6	0	0	0	0	0	0	0	0	0	0	0	16	16	16
Grand Total	19	0	0	0	19	0	0	8	0	8	0	0	0	0	0	0	0	0	0	0	0	27	27	27
Approach %	100	0	0	0	70.4	0	0	100	0	29.6	0	0	0	0	0	0	0	0	0	0	0	100	100	100
Total %	70.4	0	0	0	70.4	0	0	29.6	0	29.6	0	0	0	0	0	0	0	0	0	0	0	100	100	100

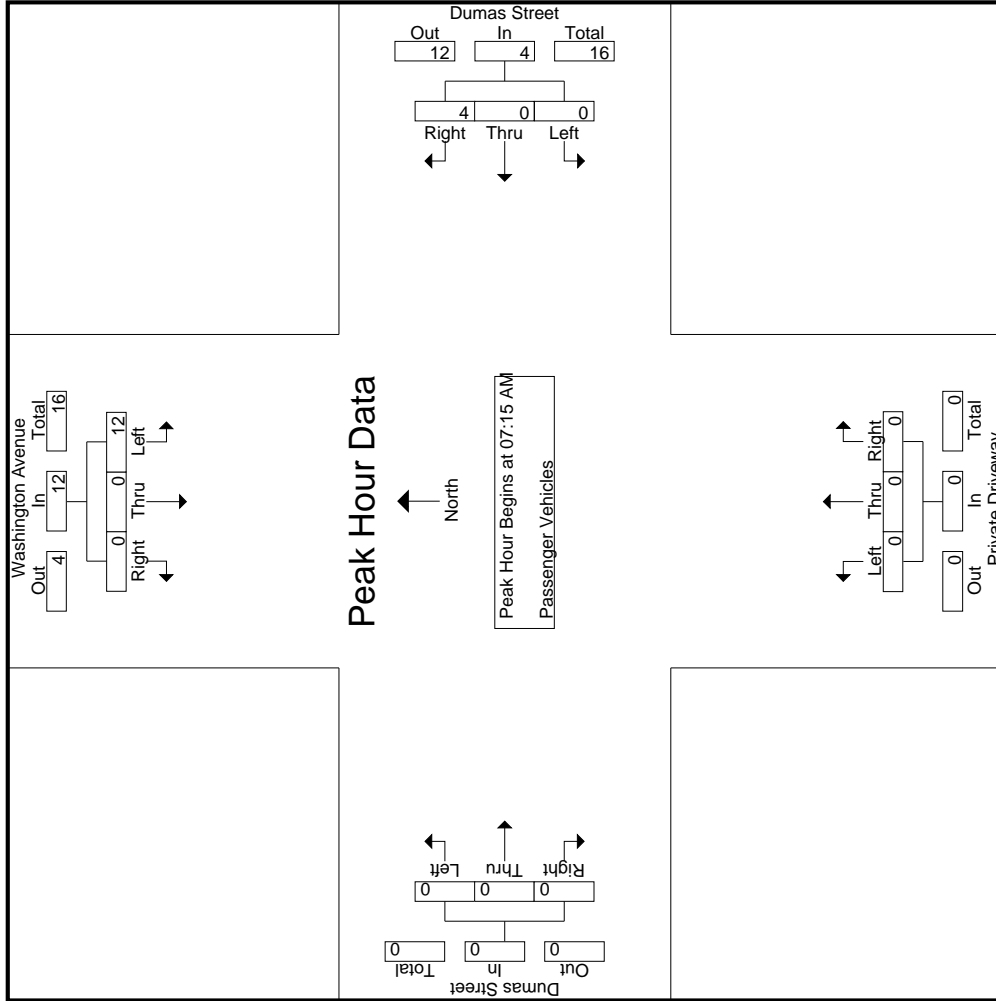
Start Time	Washington Avenue Southbound					Dumas Street Westbound					Private Driveway Northbound					Dumas Street Eastbound								
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
07:15 AM	4	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	4	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	12	0	0	0	12	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	100	0	0	0	75.0	0	0	100	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.750	.000	.000	.000	.750	.000	.000	.500	.500	.500	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.667

Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:15 AM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 06-SBCWADUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



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 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 06-SBCWADUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Washington Avenue Southbound			Dumas Street Westbound			Private Driveway Northbound			Dumas Street Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	07:15 AM													
+0 mins.	4	0	0	0	0	1	1	0	0	0	0	0	0	0
+15 mins.	3	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	1	0	0	0	0	1	1	0	0	0	0	0	0	0
+45 mins.	4	0	0	0	0	2	2	0	0	0	0	0	0	0
Total Volume	12	0	0	0	0	4	4	0	0	0	0	0	0	0
% App. Total	100	0	0	0	0	100	100	0	0	0	0	0	0	0
PHF	.750	.000	.000	.750	.000	.500	.500	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 06-SBCWADUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Large 2 Axle Vehicles

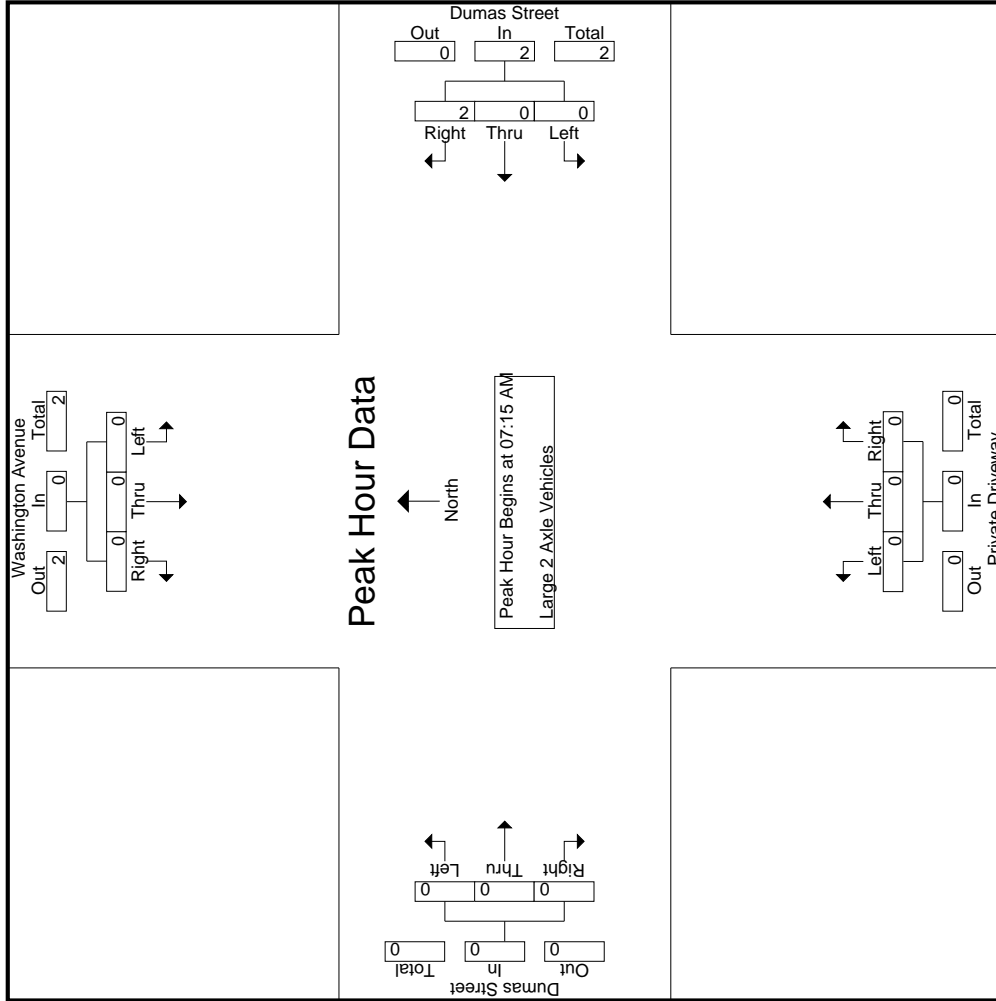
Start Time	Washington Avenue Southbound					Dumas Street Westbound					Private Driveway Northbound					Dumas Street Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	1	0	2	2
07:15 AM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1
07:30 AM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	2	0	3	0	0	0	0	0	1	0	0	0	1	0	4	4
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1
Grand Total	0	0	0	0	0	0	1	3	0	4	0	0	0	0	0	1	0	0	0	1	0	5	5
Approach %	0	0	0	0	0	0	25	75	0	80	0	0	0	0	0	100	0	0	0	20	0	100	100
Total %	0	0	0	0	0	0	20	60	0	80	0	0	0	0	0	20	0	0	0	20	0	100	100

Start Time	Washington Avenue Southbound					Dumas Street Westbound					Private Driveway Northbound					Dumas Street Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 06-SBCWADUAM
 Site Code : 05117141
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 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 06-SBCWADUAM
 Site Code : 05117141
 Start Date : 3/2/2017
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Start Time	Washington Avenue Southbound			Dumas Street Westbound			Private Driveway Northbound			Dumas Street Eastbound				
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	07:15 AM													
+0 mins.	0	0	0	0	0	1	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	1	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	2	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	100	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited
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 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 06-SBCWADUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 3 Axle Vehicles

Start Time	Washington Avenue Southbound				Dumas Street Westbound				Private Driveway Northbound				Dumas Street Eastbound				Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR			
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Approch %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total %																	100	0	

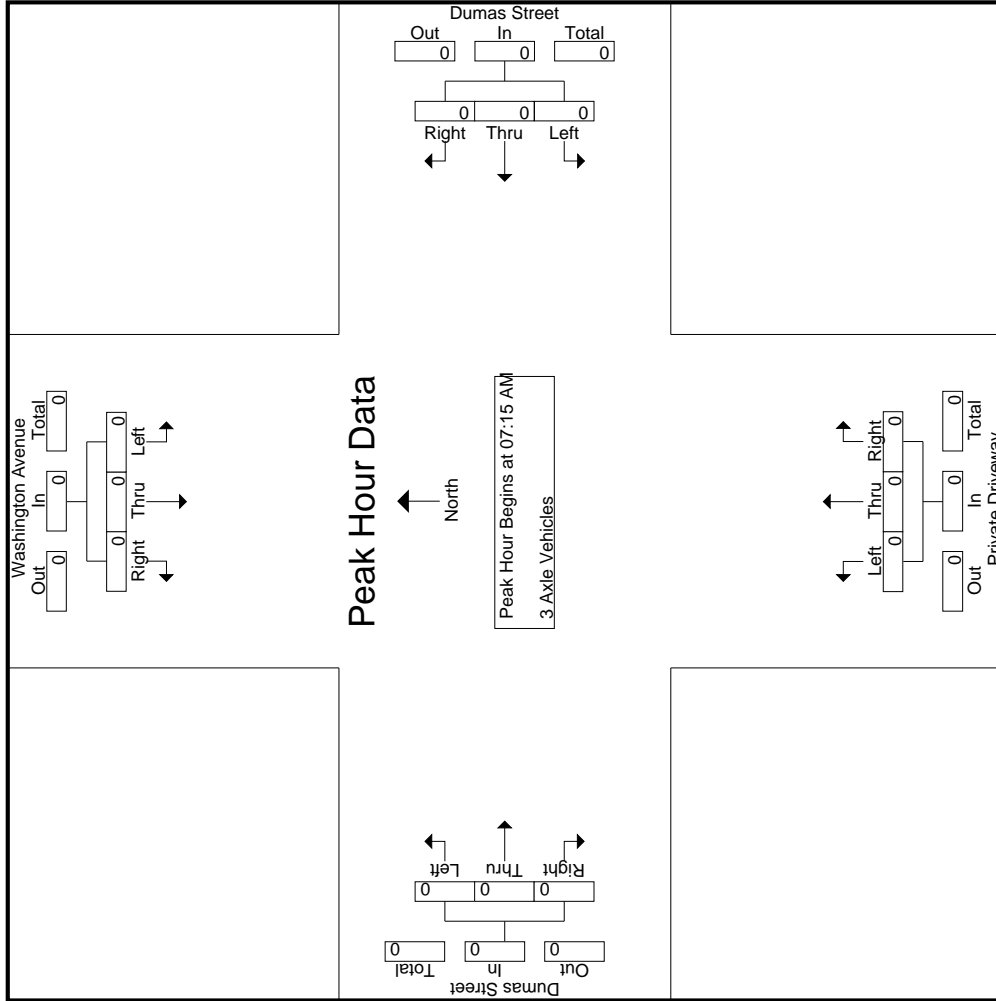
Start Time	Washington Avenue Southbound				Dumas Street Westbound				Private Driveway Northbound				Dumas Street Eastbound				Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR			
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	

Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:15 AM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 06-SBCWADUAM
 Site Code : 05117141
 Start Date : 3/2/2017
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City of San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 06-SBCWADUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Washington Avenue Southbound			Dumas Street Westbound			Private Driveway Northbound			Dumas Street Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	07:15 AM													
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited
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City of San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 06-SBCWADUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 4+ Axle Trucks

Start Time	Washington Avenue Southbound				Dumas Street Westbound				Private Driveway Northbound				Dumas Street Eastbound						
	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approch %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total %																	100	0	0

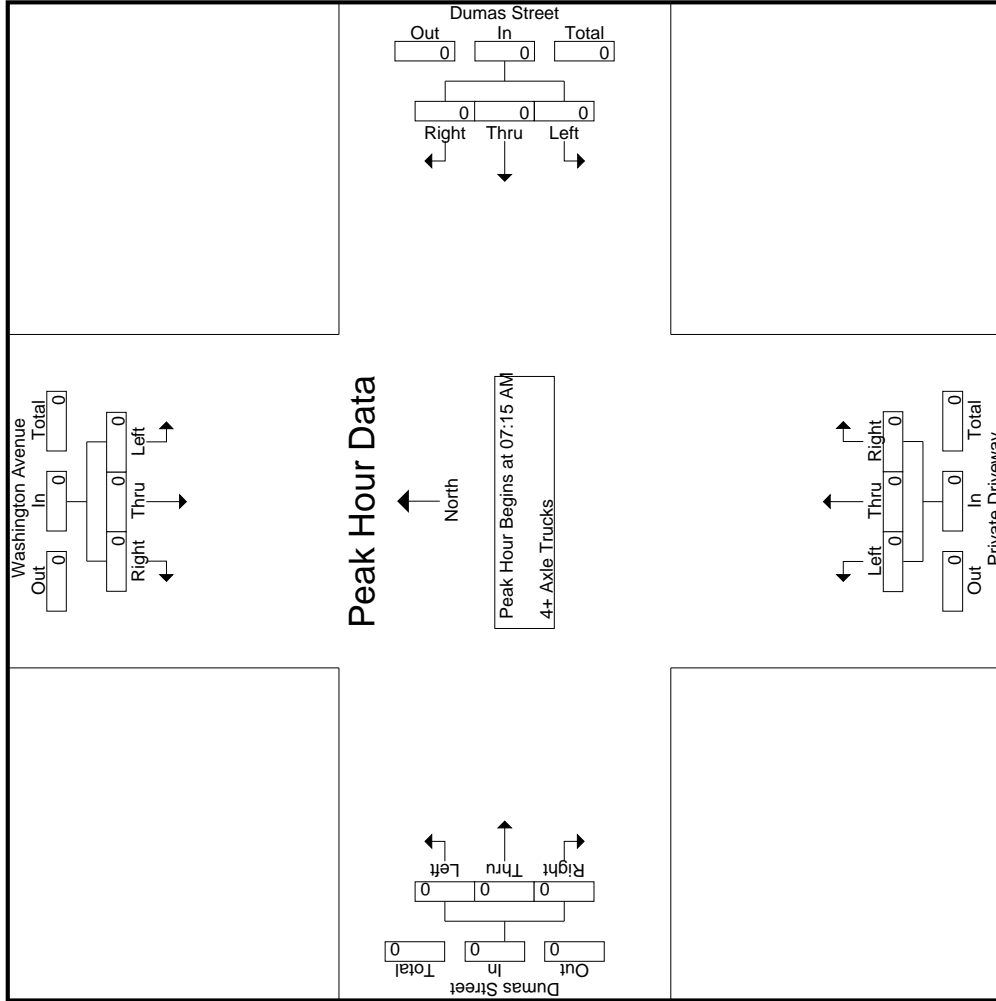
Start Time	Washington Avenue Southbound				Dumas Street Westbound				Private Driveway Northbound				Dumas Street Eastbound						
	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Exclu. Total	Inclu. Total	Int. Total
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:15 AM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 06-SBCWADUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



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 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 06-SBCWADUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Washington Avenue Southbound			Dumas Street Westbound			Private Driveway Northbound			Dumas Street Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	07:15 AM													
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited
 PO Box 1178
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City of San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 06-SBCWADUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	Washington Avenue Southbound						Dumas Street Westbound						Private Driveway Northbound						Dumas Street Eastbound					
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		Left		Thru		Right	
	Exclu. Total	Int. Total	Exclu. Total	Int. Total	Exclu. Total	Int. Total	Exclu. Total	Int. Total	Exclu. Total	Int. Total	Exclu. Total	Int. Total	Exclu. Total	Int. Total	Exclu. Total	Int. Total	Exclu. Total	Int. Total	Exclu. Total	Int. Total	Exclu. Total	Int. Total	Exclu. Total	Int. Total
04:00 PM	5	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
04:15 PM	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
04:30 PM	5	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	
04:45 PM	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	
Total	13	0	0	0	13	0	0	15	0	15	0	0	0	0	0	0	0	0	0	0	0	0	28	
05:00 PM	2	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	
05:15 PM	1	0	0	0	1	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3	
05:30 PM	1	0	0	0	1	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3	
05:45 PM	3	0	0	0	3	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	6	
Total	7	0	0	0	7	0	0	10	0	10	0	0	0	0	0	0	0	0	0	0	0	0	18	
Grand Total	20	0	0	0	20	0	0	25	0	25	0	0	0	0	0	0	0	0	0	0	0	0	46	
Approach %	100	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46	
Total %	43.5	0	0	0	43.5	0	0	54.3	0	54.3	0	0	0	0	0	0	0	0	0	0	0	0	100	
Passenger Vehicles	18	0	0	0	18	0	0	23	0	23	0	0	0	0	0	0	0	0	0	0	0	0	42	
% Passenger Vehicles	90	0	0	0	90	0	0	92	0	92	0	0	0	0	0	0	0	0	0	0	0	0	91.3	
Large 2 Axle Vehicles	2	0	0	0	2	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	4	
% Large 2 Axle Vehicles	10	0	0	0	10	0	0	8	0	8	0	0	0	0	0	0	0	0	0	0	0	0	8.7	
3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
% 3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
% 4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

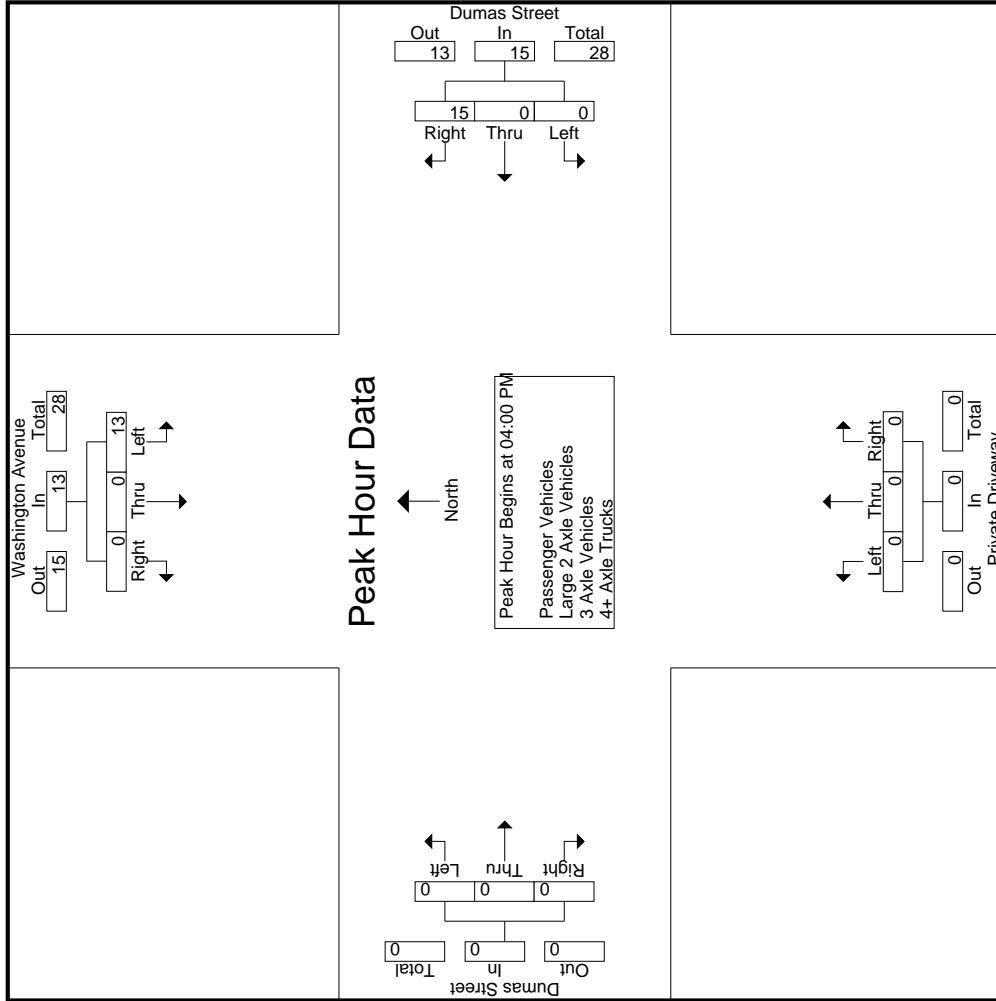
Start Time	Washington Avenue Southbound						Dumas Street Westbound						Private Driveway Northbound						Dumas Street Eastbound					
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		Left		Thru		Right	
	Exclu. Total	Int. Total	Exclu. Total	Int. Total	Exclu. Total	Int. Total	Exclu. Total	Int. Total	Exclu. Total	Int. Total	Exclu. Total	Int. Total	Exclu. Total	Int. Total	Exclu. Total	Int. Total	Exclu. Total	Int. Total	Exclu. Total	Int. Total	Exclu. Total	Int. Total	Exclu. Total	Int. Total
04:00 PM	5	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
04:15 PM	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
04:30 PM	5	0	0	0	5	0	0	8	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	13
04:45 PM	3	0	0	0	3	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	6
Total Volume	13	0	0	0	13	0	0	15	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	28
% App. Total	100	0	0	0	100	0	0	100	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	28
PHF	.650	.000	.000	.000	.650	.000	.000	.469	.000	.469	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.538

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:00 PM

Counts Unlimited
 PO Box 1178
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City of San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 06-SBCWADUPM
 Site Code : 05117141
 Start Date : 3/2/2017
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 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 06-SBCWADUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Washington Avenue Southbound			Dumas Street Westbound			Private Driveway Northbound			Dumas Street Eastbound			App. Total	Int. Total				
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right						
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																		
Peak Hour for Each Approach Begins at:																		
	04:00 PM												04:15 PM		04:00 PM		04:15 PM	
+0 mins.	5	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	
+15 mins.	0	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	
+30 mins.	5	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	
+45 mins.	3	0	0	0	0	3	3	0	0	0	0	0	1	0	0	0	1	
Total Volume	13	0	0	0	0	17	17	0	0	0	0	0	1	0	0	0	1	
% App. Total	100	0	0	0	0	100	100	0	0	0	0	0	100	0	0	0	0	
PHF	.650	.000	.000	.000	.000	.531	.531	.000	.000	.000	.000	.000	.250	.000	.000	.000	.250	

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City of San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 06-SBCWADUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles

Start Time	Washington Avenue Southbound					Dumas Street Westbound					Private Driveway Northbound					Dumas Street Eastbound								
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
04:00 PM	4	0	0	0	4	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	5	5	5
04:15 PM	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	3	3	3
04:30 PM	4	0	0	0	4	0	0	6	0	6	0	0	0	0	0	0	0	0	0	0	0	10	10	10
04:45 PM	3	0	0	0	3	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	6	6	6
Total	11	0	0	0	11	0	0	13	0	13	0	0	0	0	0	0	0	0	0	0	0	24	24	24
05:00 PM	2	0	0	0	2	0	0	3	0	3	0	0	0	0	0	1	0	0	0	0	0	6	6	6
05:15 PM	1	0	0	0	1	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	3	3	3
05:30 PM	1	0	0	0	1	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	3	3	3
05:45 PM	3	0	0	0	3	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	6	6	6
Total	7	0	0	0	7	0	0	10	0	10	0	0	0	0	0	1	0	0	0	0	0	18	18	18
Grand Total	18	0	0	0	18	0	0	23	0	23	0	0	0	0	0	1	0	0	0	0	0	42	42	42
Approach %	100	0	0	0	42.9	0	0	100	0	54.8	0	0	0	0	100	2.4	0	0	0	0	0	100	100	100
Total %	42.9	0	0	0	42.9	0	0	54.8	0	54.8	0	0	0	0	2.4	0	0	0	0	0	0	100	100	100

Start Time	Washington Avenue Southbound					Dumas Street Westbound					Private Driveway Northbound					Dumas Street Eastbound								
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
04:00 PM	4	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	4	0	0	0	4	0	0	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	3	0	0	0	3	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	11	0	0	0	11	0	0	13	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	2	0	0	0	2	0	0	3	0	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0
05:15 PM	1	0	0	0	1	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	1	0	0	0	1	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	3	0	0	0	3	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	7	0	0	0	7	0	0	10	0	10	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Grand Total	18	0	0	0	18	0	0	23	0	23	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Approach %	100	0	0	0	42.9	0	0	100	0	54.8	0	0	0	0	100	2.4	0	0	0	0	0	0	0	0
Total %	42.9	0	0	0	42.9	0	0	54.8	0	54.8	0	0	0	0	2.4	0	0	0	0	0	0	0	0	0

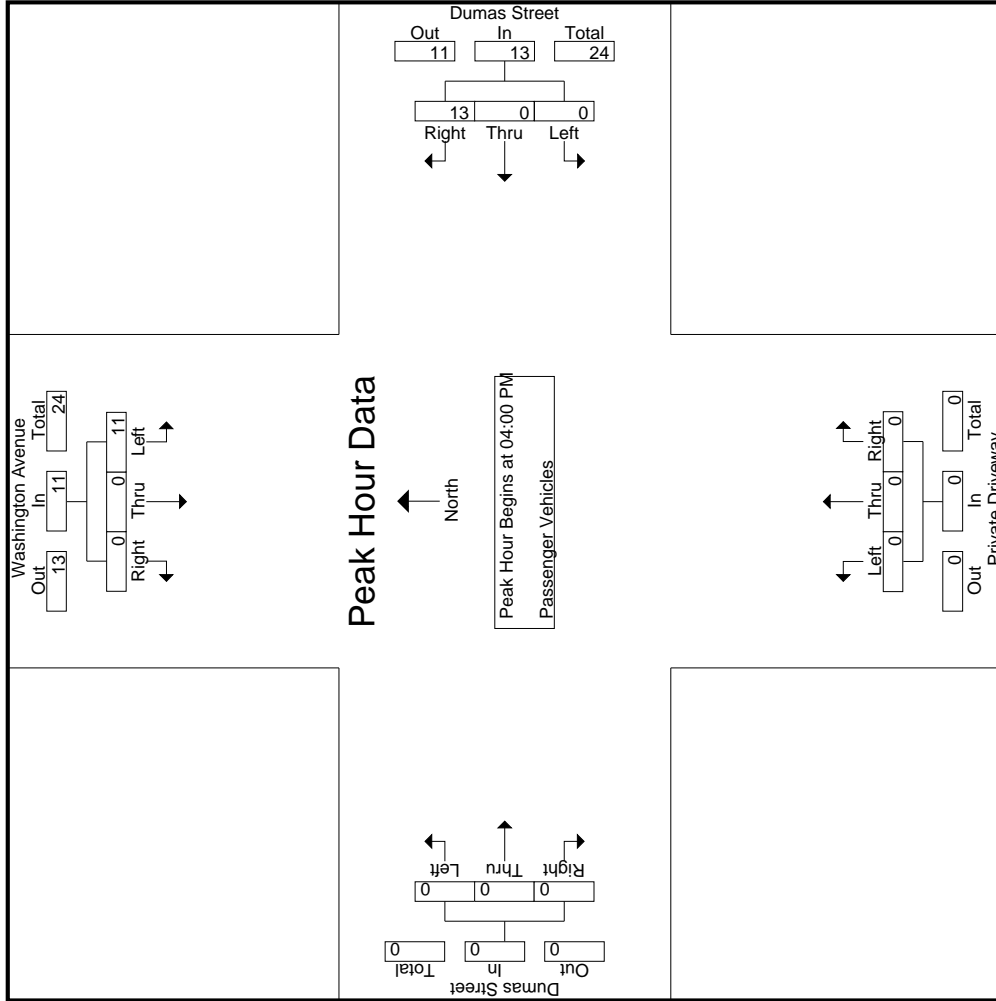
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:00 PM

Start Time	Washington Avenue Southbound					Dumas Street Westbound					Private Driveway Northbound					Dumas Street Eastbound								
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
04:00 PM	4	0	0	0	4	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	4	0	0	0	4	0	0	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	3	0	0	0	3	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	11	0	0	0	11	0	0	13	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	100	0	0	0	100	0	0	100	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.688	.000	.000	.000	.688	.000	.000	.542	.000	.542	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.600

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 06-SBCWADUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 06-SBCWADUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Washington Avenue Southbound			Dumas Street Westbound			Private Driveway Northbound			Dumas Street Eastbound				
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	04:00 PM													
+0 mins.	4	0	0	0	0	1	1	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	3	3	0	0	0	0	0	0	0
+30 mins.	4	0	0	0	0	6	6	0	0	0	0	0	0	0
+45 mins.	3	0	0	0	0	3	3	0	0	0	0	0	0	0
Total Volume	11	0	0	0	0	13	13	0	0	0	0	0	0	0
% App. Total	100	0	0	0	0	100	100	0	0	0	0	0	0	0
PHF	.688	.000	.000	.688	.000	.542	.542	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 06-SBCWADUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Large 2 Axle Vehicles

Start Time	Washington Avenue Southbound				Dumas Street Westbound				Private Driveway Northbound				Dumas Street Eastbound				Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR			
04:00 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
04:30 PM	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	3	
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	2	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	4	
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Grand Total	2	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	4	
Approch %	100	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	100	
Total %	50	0	0	0	0	0	50	0	0	0	0	0	0	0	0	0	0	100	

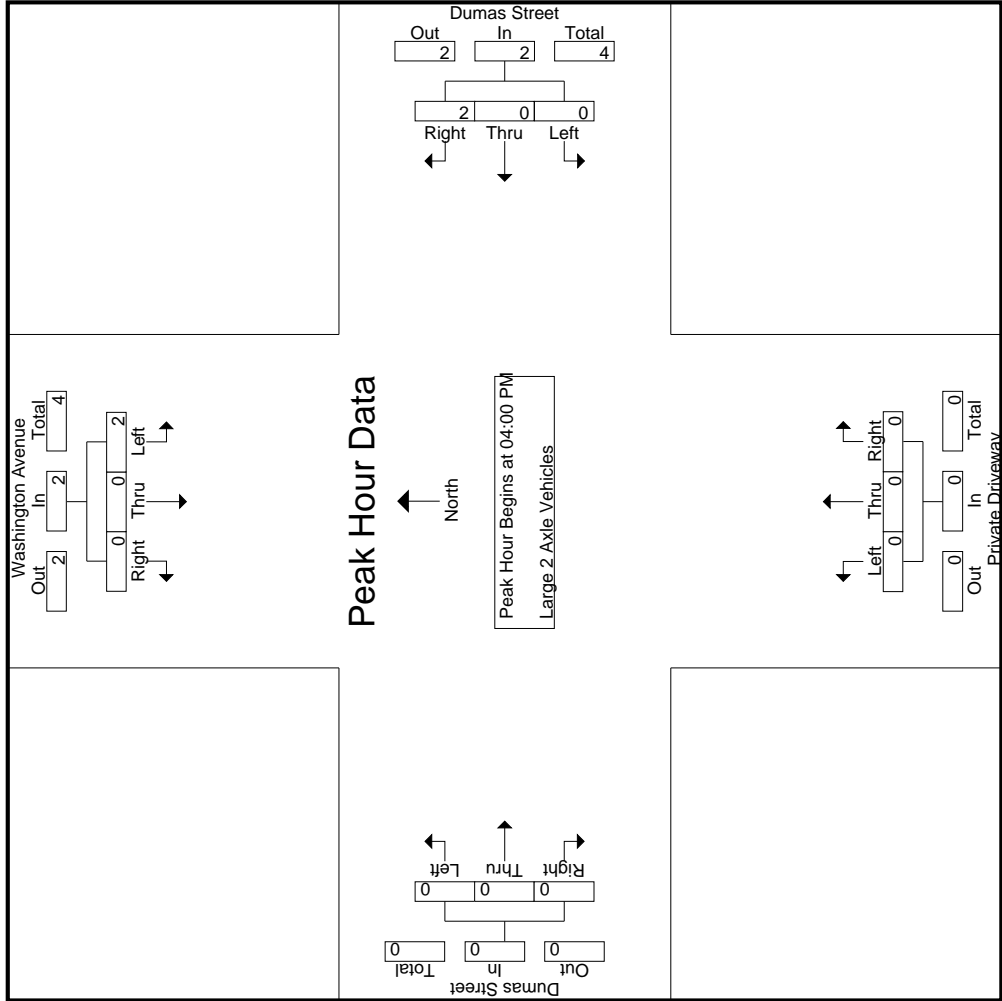
Start Time	Washington Avenue Southbound				Dumas Street Westbound				Private Driveway Northbound				Dumas Street Eastbound				Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR			
04:00 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
04:30 PM	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	3	
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	2	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	4	
% App. Total	100	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	100	
PHF	.500	.000	.000	.000	.500	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.333	

Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:00 PM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 06-SBCWADUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 06-SBCWADUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Washington Avenue Southbound			Dumas Street Westbound			Private Driveway Northbound			Dumas Street Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	04:00 PM													
+0 mins.	1	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	1	0	0	0	0	2	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	2	0	0	0	0	2	0	0	0	0	0	0	0	0
% App. Total	100	0	0	0	0	100	0	0	0	0	0	0	0	0
PHF	.500	.000	.000	.500	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 06-SBCWADUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 3 Axle Vehicles

Start Time	Washington Avenue Southbound				Dumas Street Westbound				Private Driveway Northbound				Dumas Street Eastbound					
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total %																100	0	0

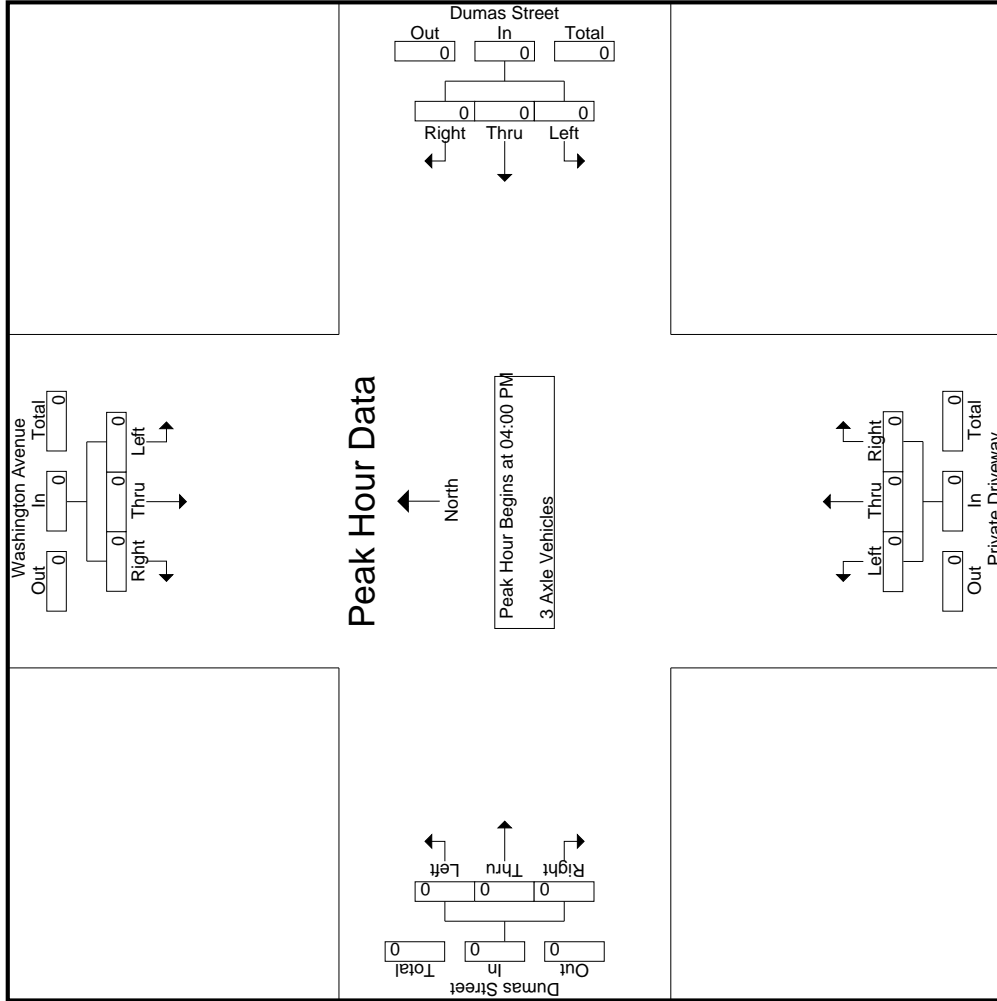
Start Time	Washington Avenue Southbound				Dumas Street Westbound				Private Driveway Northbound				Dumas Street Eastbound						
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:00 PM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 06-SBCWADUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 06-SBCWADUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Washington Avenue Southbound			Dumas Street Westbound			Private Driveway Northbound			Dumas Street Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	04:00 PM													
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 06-SBCWADUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 4+ Axle Trucks

Start Time	Washington Avenue Southbound				Dumas Street Westbound				Private Driveway Northbound				Dumas Street Eastbound					
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total %																100	0	0

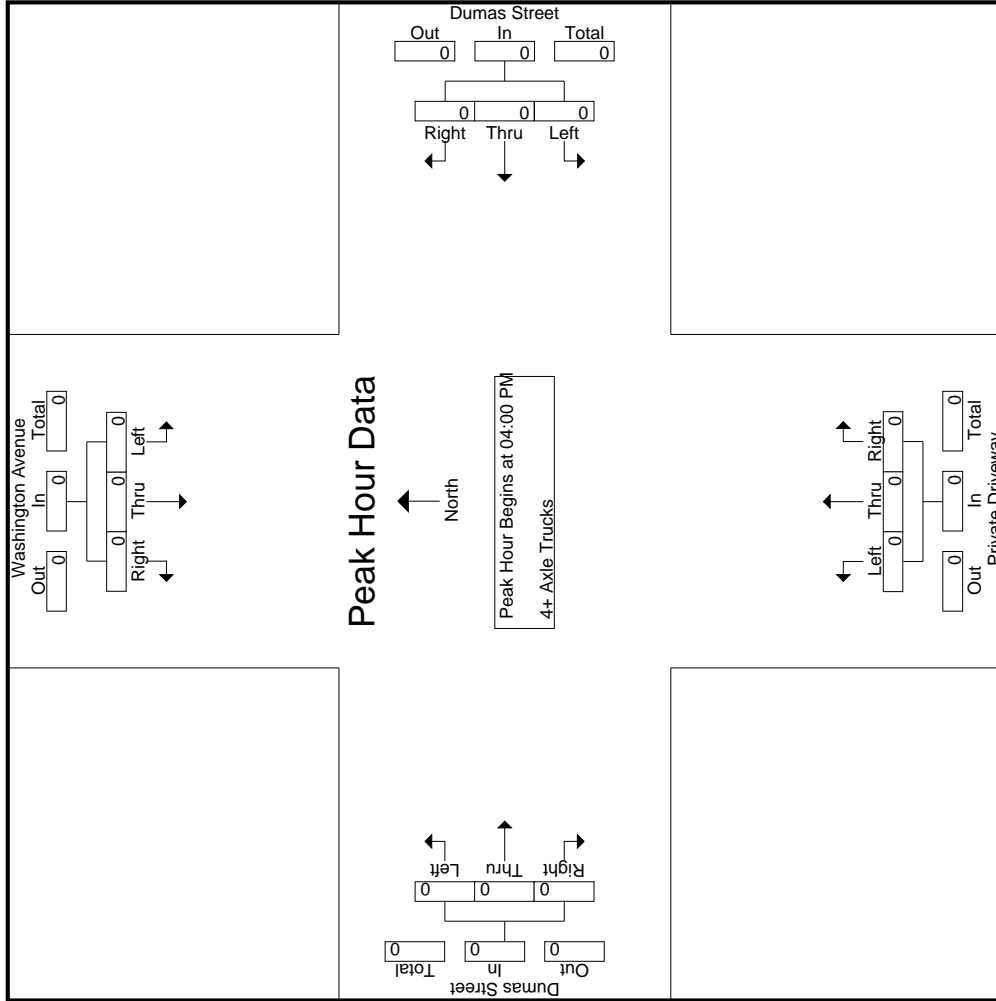
Start Time	Washington Avenue Southbound				Dumas Street Westbound				Private Driveway Northbound				Dumas Street Eastbound						
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:00 PM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 06-SBCWADUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 06-SBCWADUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Washington Avenue Southbound			Dumas Street Westbound			Private Driveway Northbound			Dumas Street Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	04:00 PM													
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Location: San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street



Date: 3/2/2017
 Day: Thursday

PEDESTRIANS

	North Leg Washington Avenue	East Leg Orange Show Road	South Leg Private Driveway	West Leg Dumas Street	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

	North Leg Washington Avenue	East Leg Orange Show Road	South Leg Private Driveway	West Leg Dumas Street	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

Location: San Bernardino
 N/S: Washington Avenue
 E/W: Dumas Street



Date: 3/2/2017
 Day: Thursday

BICYCLES

	North Leg Washington Avenue	East Leg Orange Show Road	South Leg Private Driveway	West Leg Dumas Street	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

	North Leg Washington Avenue	East Leg Orange Show Road	South Leg Private Driveway	West Leg Dumas Street	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-10 EB Off Ramp/Club Center Drive
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 07-SBC10EREM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	I-10 Eastbound Off Ramp Southbound					Redlands Boulevard Westbound					Club Center Drive Northbound					Redlands Boulevard Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	122	63	127	1	312	1	56	0	0	57	0	0	0	0	0	0	78	1	1	79	2	448	450
07:15 AM	128	69	135	1	332	6	58	0	0	64	0	0	2	2	2	0	95	5	2	100	5	498	503
07:30 AM	142	72	130	1	344	11	83	0	0	94	0	0	5	4	5	0	103	4	4	107	9	550	559
07:45 AM	148	83	156	0	387	11	105	0	0	116	0	0	3	3	3	0	104	13	3	117	6	623	629
Total	540	287	548	3	1375	29	302	0	0	331	0	0	10	9	10	0	380	23	10	403	22	2119	2141
08:00 AM	142	58	138	0	338	6	99	0	0	105	0	0	8	6	8	0	117	10	1	127	7	578	585
08:15 AM	125	77	143	1	345	5	91	0	0	96	0	0	5	2	5	0	96	4	2	100	5	546	551
08:30 AM	141	57	140	0	338	4	72	0	0	76	0	0	2	1	2	0	94	9	5	103	6	519	525
08:45 AM	134	51	159	0	344	3	77	0	0	80	0	0	7	6	7	0	82	6	2	88	8	519	527
Total	542	243	580	1	1365	18	339	0	0	357	0	0	22	15	22	0	389	29	10	418	26	2162	2188
Grand Total	1082	530	1128	4	2740	47	641	0	0	688	0	0	32	24	32	0	769	52	20	821	48	4281	4329
Approach %	39.5	19.3	41.2			6.8	93.2	0			0	0	100			0	93.7	6.3					
Total %	25.3	12.4	26.3		64	1.1	15	0		16.1	0	0	0.7		0.7	0	18	1.2		19.2	1.1	98.9	
Passenger Vehicles	1052	518	1070		2644	46	608	0		654	0	0	31		54	0	720	51		791	0	0	4143
% Passenger Vehicles	97.2	97.7	94.9	100	96.4	97.9	94.9	0		95.1	0	0	96.9	95.8	96.4	0	93.6	98.1	100	94.1	0	0	95.7
Large 2 Axle Vehicles	20	3	21		44	0	14	0		14	0	0	0		0	0	18	0		18	0	0	76
% Large 2 Axle Vehicles	1.8	0.6	1.9	0	1.6	0	2.2	0		2	0	0	0		0	0	2.3	0		2.1	0	0	1.8
3 Axle Vehicles	3	0	6		9	0	3	0		3	0	0	1		2	0	3	1		4	0	0	18
% 3 Axle Vehicles	0.3	0	0.5	0	0.3	0	0.5	0		0.4	0	0	3.1	4.2	3.6	0	0.4	1.9	0	0.5	0	0	0.4
4+ Axle Trucks	7	9	31		47	1	16	0		17	0	0	0		0	0	28	0		28	0	0	92
% 4+ Axle Trucks	0.6	1.7	2.7	0	1.7	2.1	2.5	0		2.5	0	0	0		0	0	3.6	0		3.3	0	0	2.1

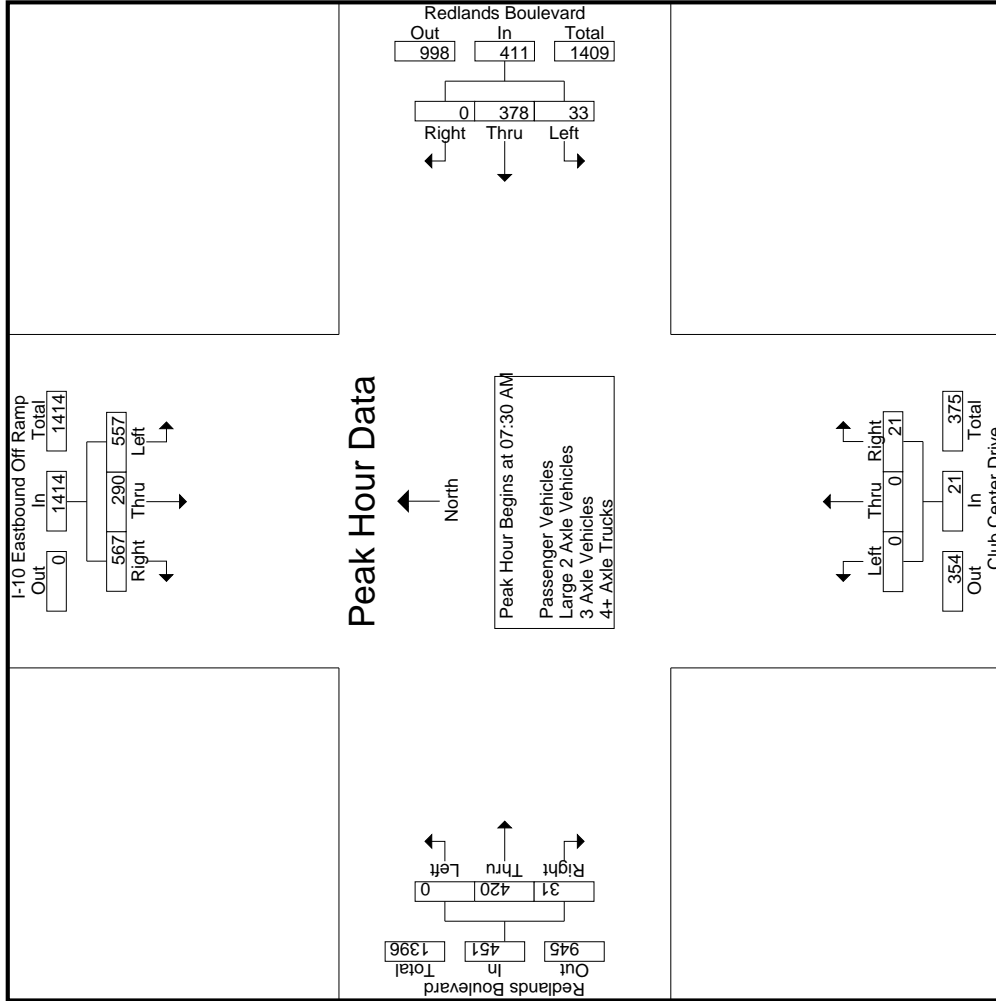
Start Time	I-10 Eastbound Off Ramp Southbound					Redlands Boulevard Westbound					Club Center Drive Northbound					Redlands Boulevard Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:30 AM	142	72	130		344	11	83	0		94	0	0	5		5	0	103	4		107	4	107	550
07:45 AM	148	83	156		387	11	105	0		116	0	0	3		3	0	104	13		117	117	623	623
08:00 AM	142	58	138		338	6	99	0		105	0	0	8		8	0	117	10		127	10	127	578
08:15 AM	125	77	143		345	5	91	0		96	0	0	5		5	0	96	4		100	4	100	546
Total Volume	557	290	567		1414	33	378	0		411	0	0	21		21	0	420	31		451	451	2297	2297
% App. Total	39.4	20.5	40.1		40.1	8	92	0		0	0	0	100		0	0	93.1	6.9		93.1	6.9	93.1	93.1
PHF	.941	.873	.909		.913	.750	.900	.000		.886	.000	.000	.656		.656	.000	.897	.596		.888	.888	.888	.922

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:30 AM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-10 EB Off Ramp/Club Center Drive
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 07-SBC10EREM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
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 (951) 268-6268

City of San Bernardino
 N/S: I-10 EB Off Ramp/Club Center Drive
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 07-SBC10EREAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	I-10 Eastbound Off Ramp Southbound			Redlands Boulevard Westbound			Club Center Drive Northbound			Redlands Boulevard Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	07:30 AM			07:30 AM			08:00 AM			07:15 AM				
+0 mins.	142	72	130	83	0	0	0	0	0	0	95	5	100	
+15 mins.	148	83	156	105	0	0	0	0	0	0	103	4	107	
+30 mins.	142	58	138	99	0	0	0	0	0	0	104	13	117	
+45 mins.	125	77	143	91	0	0	0	0	0	0	117	10	127	
Total Volume	557	290	567	378	0	0	0	0	0	0	419	32	451	
% App. Total	39.4	20.5	40.1	8	0	0	0	0	0	0	92.9	7.1		
PHF	.941	.873	.909	.750	.900	.000	.886	.000	.688	.000	.895	.615	.888	

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City of San Bernardino
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 Weather: Clear

File Name : 07-SBC10ERAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles

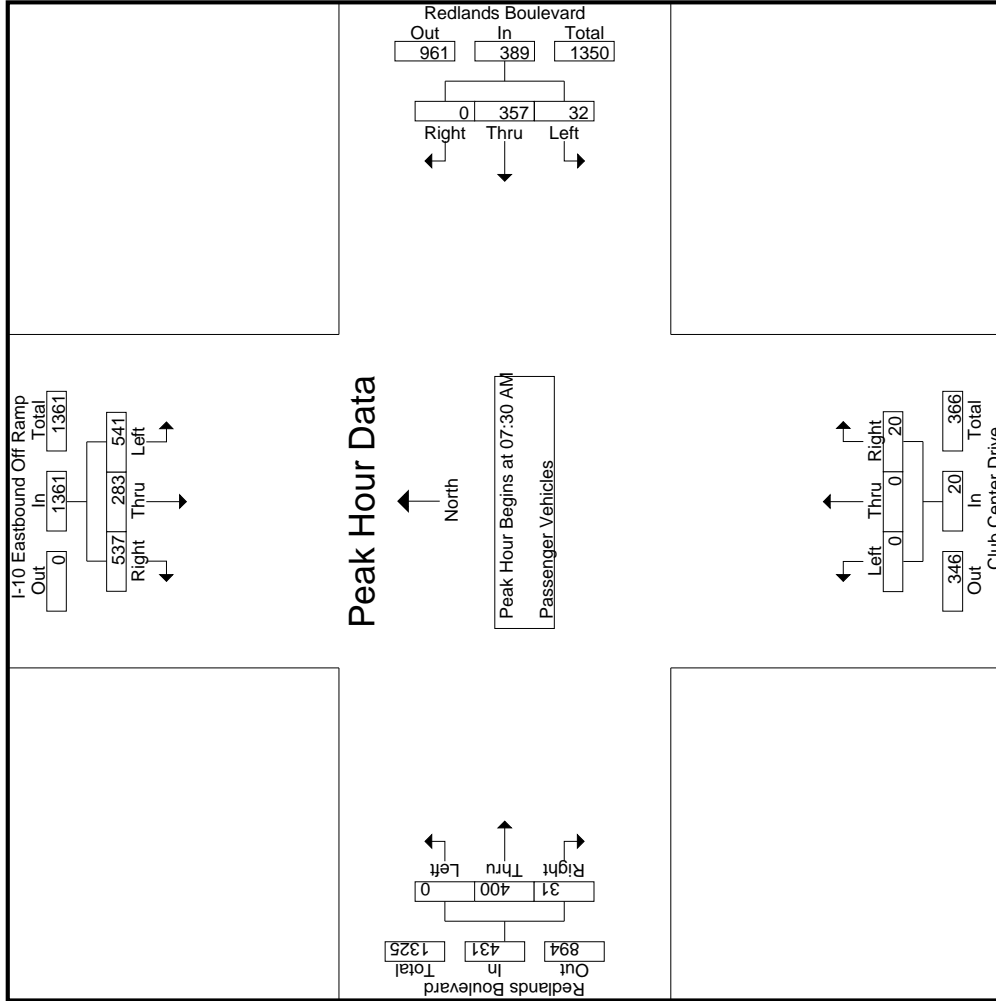
Start Time	I-10 Eastbound Off Ramp Southbound					Redlands Boulevard Westbound					Club Center Drive Northbound					Redlands Boulevard Eastbound					Int. Total		
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total		Exclu. Total	Inclu. Total
07:00 AM	120	62	120	1	302	1	54	0	0	55	0	0	0	0	0	0	72	1	1	73	2	430	432
07:15 AM	125	68	130	1	323	6	55	0	0	61	0	0	2	2	2	0	90	5	2	95	5	481	486
07:30 AM	138	70	127	1	335	10	80	0	0	90	0	0	5	4	5	0	98	4	4	102	9	532	541
07:45 AM	147	82	150	0	379	11	99	0	0	110	0	3	3	3	3	0	101	13	3	114	6	606	612
Total	530	282	527	3	1339	28	288	0	0	316	0	0	10	9	10	0	361	23	10	384	22	2049	2071
08:00 AM	136	55	130	0	321	6	94	0	0	100	0	0	7	5	7	0	107	10	1	117	6	545	551
08:15 AM	120	76	130	1	326	5	84	0	0	89	0	0	5	2	5	0	94	4	2	98	5	518	523
08:30 AM	138	57	134	0	329	4	69	0	0	73	0	0	2	1	2	0	82	8	5	90	6	494	500
08:45 AM	128	48	149	0	325	3	73	0	0	76	0	0	7	6	7	0	76	6	2	82	8	490	498
Total	522	236	543	1	1301	18	320	0	0	338	0	0	21	14	21	0	359	28	10	387	25	2047	2072
Grand Total	1052	518	1070	4	2640	46	608	0	0	654	0	0	31	23	31	0	720	51	20	771	47	4096	4143
Approach %	39.8	19.6	40.5		64.5	7	93	0	0	16	0	0	0	0.8	0.8	0	93.4	6.6		18.8	1.1	98.9	
Total %	25.7	12.6	26.1			1.1	14.8	0	0		0	0	0			0	17.6	1.2					

Start Time	I-10 Eastbound Off Ramp Southbound					Redlands Boulevard Westbound					Club Center Drive Northbound					Redlands Boulevard Eastbound					Int. Total		
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total		Exclu. Total	Inclu. Total
07:30 AM	138	70	127		335	10	80	0		90	0	0	0		5	0	98	4		102	4	532	541
07:45 AM	147	82	150		379	11	99	0		110	0	0	3		3	0	101	13		114	6	606	612
08:00 AM	136	55	130		321	6	84	0		100	0	0	5		5	0	94	4		98	5	518	523
08:15 AM	120	76	130		326	5	84	0		89	0	0	2		2	0	82	8		90	6	494	500
Total Volume	541	283	537		1361	32	357	0		389	0	0	20		20	0	400	31		431	22	2201	2271
% App. Total	39.8	20.8	39.5		64.5	8.2	91.8	0		100	0	0	100		100	0	92.8	7.2		18.8	1.1	98.9	
PHF	.920	.863	.895		.898	.727	.902	.000		.884	.000	.000	.714		.714	.000	.935	.596		.908			

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-10 EB Off Ramp/Club Center Drive
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 07-SBC10EREM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
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City of San Bernardino
 N/S: I-10 EB Off Ramp/Club Center Drive
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 07-SBC10EREAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	I-10 Eastbound Off Ramp Southbound			Redlands Boulevard Westbound			Club Center Drive Northbound			Redlands Boulevard Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	07:30 AM													
+0 mins.	138	70	127	10	80	0	0	0	5	0	98	4	102	
+15 mins.	147	82	150	11	99	0	0	0	3	0	101	13	114	
+30 mins.	136	55	130	6	94	0	0	0	7	0	107	10	117	
+45 mins.	120	76	130	5	84	0	0	0	5	0	94	4	98	
Total Volume	541	283	537	32	357	0	0	0	20	0	400	31	431	
% App. Total	39.8	20.8	39.5	8.2	91.8	0	0	0	100	0	92.8	7.2		
PHF	.920	.863	.895	.727	.902	.000	.000	.000	.714	.000	.935	.596	.921	

Counts Unlimited
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City of San Bernardino
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 E/W: Redlands Boulevard
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File Name : 07-SBC10EREM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Large 2 Axle Vehicles

Start Time	I-10 Eastbound Off Ramp Southbound					Redlands Boulevard Westbound					Club Center Drive Northbound					Redlands Boulevard Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	2	0	4	0	6	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	8
07:15 AM	3	1	2	0	6	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	9
07:30 AM	2	0	1	0	3	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	6
07:45 AM	0	0	1	0	1	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	0	0	5
Total	7	1	8	0	16	0	5	0	0	5	0	0	0	0	0	0	7	0	0	7	0	0	28
08:00 AM	4	0	3	0	7	0	4	0	0	4	0	0	0	0	0	0	6	0	0	6	0	0	17
08:15 AM	3	0	5	0	8	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	10
08:30 AM	2	0	1	0	3	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	0	0	8
08:45 AM	4	2	4	0	10	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	13
Total	13	2	13	0	28	0	9	0	0	9	0	0	0	0	0	0	11	0	0	11	0	0	48
Grand Total	20	3	21	0	44	0	14	0	0	14	0	0	0	0	0	0	18	0	0	18	0	0	76
Approach %	45.5	6.8	47.7			0	100	0		18.4	0	0	0		0	100	0	0		23.7	0	0	100
Total %	26.3	3.9	27.6		57.9	0	18.4	0		18.4	0	0	0		0	23.7	0	0		23.7	0	0	100

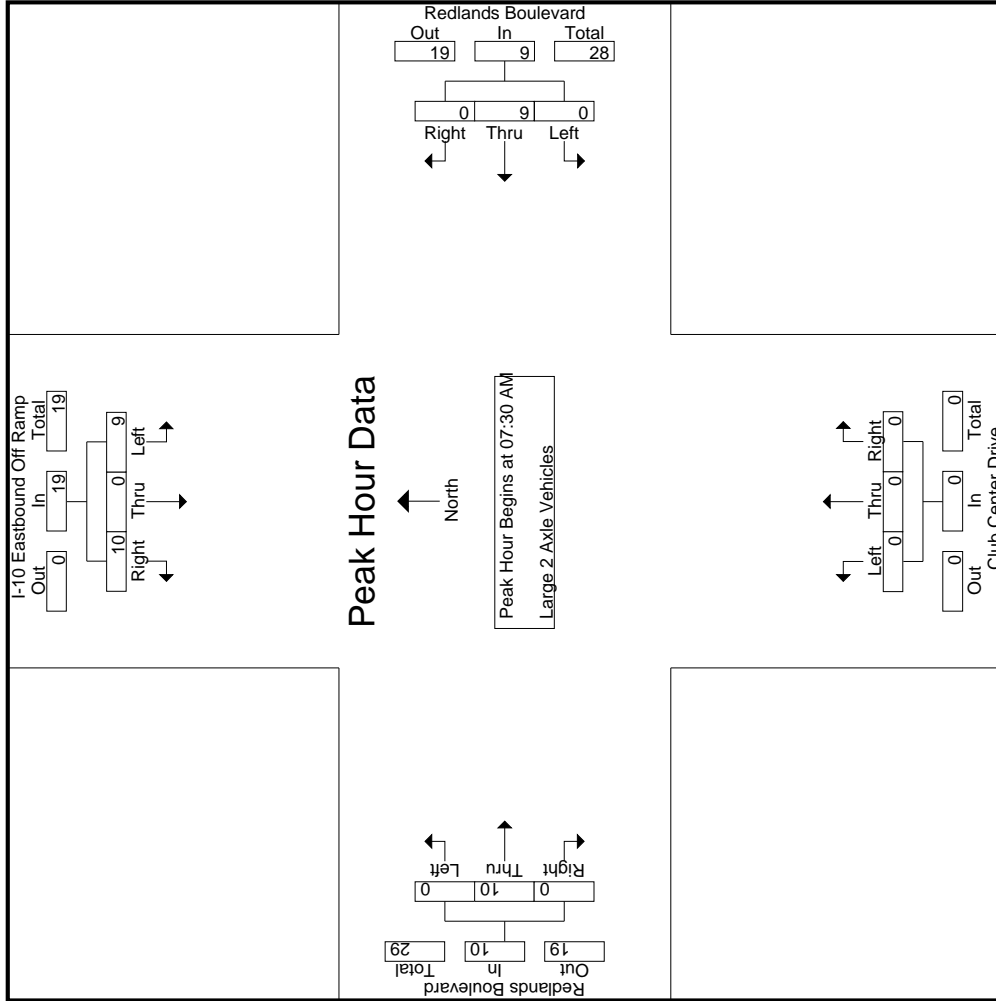
Start Time	I-10 Eastbound Off Ramp Southbound					Redlands Boulevard Westbound					Club Center Drive Northbound					Redlands Boulevard Eastbound								
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
07:30 AM	2	0	1	0	3	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	6
07:45 AM	0	0	1	0	1	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	0	0	2	5
08:00 AM	4	0	3	0	7	0	4	0	0	4	0	0	0	0	0	0	6	0	0	6	0	0	6	17
08:15 AM	3	0	5	0	8	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	10
Total Volume	9	0	10	0	19	0	9	0	0	9	0	0	0	0	0	0	10	0	0	10	0	0	10	38
% App. Total	47.4	0	52.6			0	100	0		56.3	0	0	0		0	100	0	0		100	0	0	100	
PHF	.563	.000	.500		.594	.000	.563	.000		.563	.000	.000	.000		.000	.417	.000	.000		.417	.000	.417	.559	

Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:30 AM

Counts Unlimited
 PO Box 1178
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City of San Bernardino
 N/S: I-10 EB Off Ramp/Club Center Drive
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 07-SBC10EREM
 Site Code : 05117141
 Start Date : 3/2/2017
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City of San Bernardino
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 E/W: Redlands Boulevard
 Weather: Clear

File Name : 07-SBC10EREM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	I-10 Eastbound Off Ramp Southbound			Redlands Boulevard Westbound			Club Center Drive Northbound			Redlands Boulevard Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	07:30 AM												07:30 AM	07:30 AM
+0 mins.	2	0	1	0	1	0	0	0	0	0	2	0	0	2
+15 mins.	0	0	1	0	2	0	0	0	0	0	2	0	0	2
+30 mins.	4	0	3	0	4	0	0	0	0	0	6	0	0	6
+45 mins.	3	0	5	0	2	0	0	0	0	0	0	0	0	0
Total Volume	9	0	10	0	9	0	0	0	0	0	10	0	0	10
% App. Total	47.4	0	52.6	0	100	0	0	0	0	0	100	0	0	100
PHF	.563	.000	.500	.000	.563	.000	.000	.000	.000	.000	.417	.000	.000	.417

Counts Unlimited
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City of San Bernardino
 N/S: I-10 EB Off Ramp/Club Center Drive
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 07-SBC10EREM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 3 Axle Vehicles

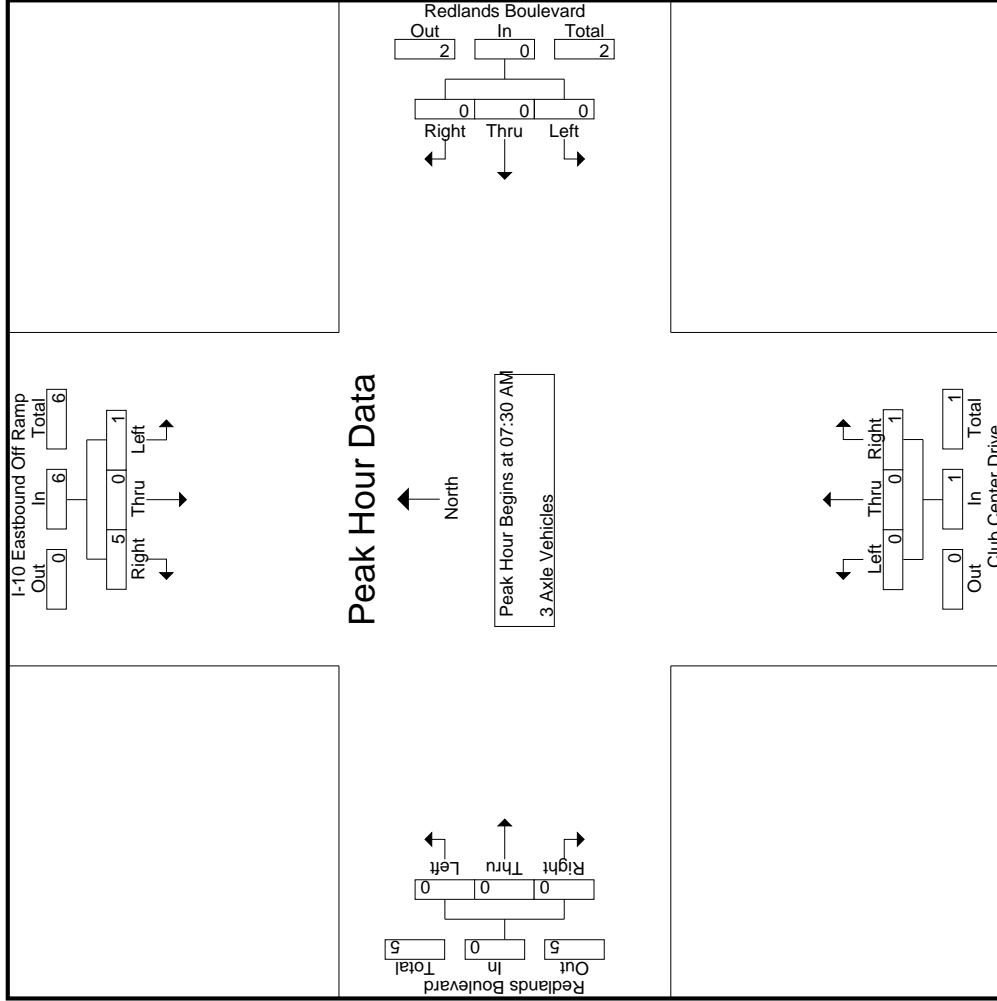
Start Time	I-10 Eastbound Off Ramp Southbound					Redlands Boulevard Westbound					Club Center Drive Northbound					Redlands Boulevard Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	1
07:30 AM	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
07:45 AM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
Total	1	0	3	0	4	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	5	5
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	1	1	2
08:15 AM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	0	2	2
08:45 AM	2	0	1	0	3	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	0	7	7
Total	2	0	3	0	5	0	3	0	0	3	0	0	1	1	1	0	2	1	0	3	1	12	13
Grand Total	3	0	6	0	9	0	3	0	0	3	0	0	1	1	1	0	3	1	0	4	1	17	18
Approach %	33.3	0	66.7		52.9	0	100	0		17.6	0	0	100		5.9	0	75	25		23.5	5.6	94.4	
Total %	17.6	0	35.3			0	17.6	0			0	0	5.9			0	17.6	5.9					

Start Time	I-10 Eastbound Off Ramp Southbound					Redlands Boulevard Westbound					Club Center Drive Northbound					Redlands Boulevard Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:30 AM	1	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
07:45 AM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1
08:15 AM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total Volume	1	0	5	0	6	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	7
% App. Total	16.7	0	83.3		83.3	0	0	0		100	0	0	0		.250	0	0	0		.250	0	0	7
PHF	.250	.000	.625		.750	.000	.000	.000		.000	.250	.000	.000		.250	.000	.000	.000		.000	.000	.000	.875

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-10 EB Off Ramp/Club Center Drive
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 07-SBC10ERAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



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 (951) 268-6268

City of San Bernardino
 N/S: I-10 EB Off Ramp/Club Center Drive
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 07-SBC10EREM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	I-10 Eastbound Off Ramp Southbound			Redlands Boulevard Westbound			Club Center Drive Northbound			Redlands Boulevard Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	07:30 AM													
+0 mins.	1	0	1	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	2	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	1	0	0	0	0	0
+45 mins.	0	0	2	0	0	0	0	0	0	0	0	0	0	0
Total Volume	1	0	5	0	0	0	0	0	1	0	0	0	0	0
% App. Total	16.7	0	83.3	0	0	0	0	0	100	0	0	0	0	0
PHF	.250	.000	.625	.750	.000	.000	.000	.000	.250	.000	.000	.000	.000	.000

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-10 EB Off Ramp/Club Center Drive
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 07-SBC10EREM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 4+ Axle Trucks

Start Time	I-10 Eastbound Off Ramp Southbound					Redlands Boulevard Westbound					Club Center Drive Northbound					Redlands Boulevard Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	1	3	0	4	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	0	10	10
07:15 AM	0	0	3	0	3	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	7	7
07:30 AM	1	2	1	0	4	1	2	0	0	3	0	0	0	0	0	0	3	0	0	3	0	10	10
07:45 AM	1	1	3	0	5	0	4	0	0	4	0	0	0	0	0	0	1	0	0	1	0	10	10
Total	2	4	10	0	16	1	9	0	0	10	0	0	0	0	0	0	11	0	0	11	0	37	37
08:00 AM	2	3	5	0	10	0	1	0	0	1	0	0	0	0	0	0	4	0	0	4	0	15	15
08:15 AM	2	1	6	0	9	0	5	0	0	5	0	0	0	0	0	0	2	0	0	2	0	16	16
08:30 AM	1	0	5	0	6	0	1	0	0	1	0	0	0	0	0	0	8	0	0	8	0	15	15
08:45 AM	0	1	5	0	6	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	9	9
Total	5	5	21	0	31	0	7	0	0	7	0	0	0	0	0	0	17	0	0	17	0	55	55
Grand Total	7	9	31	0	47	1	16	0	0	17	0	0	0	0	0	0	28	0	0	28	0	92	92
Approach %	14.9	19.1	66		51.1	5.9	94.1	0		18.5	0	0	0		0	100	0		30.4	0	100	100	
Total %	7.6	9.8	33.7		51.1	1.1	17.4	0		18.5	0	0	0		0	30.4	0		30.4	0	100	100	

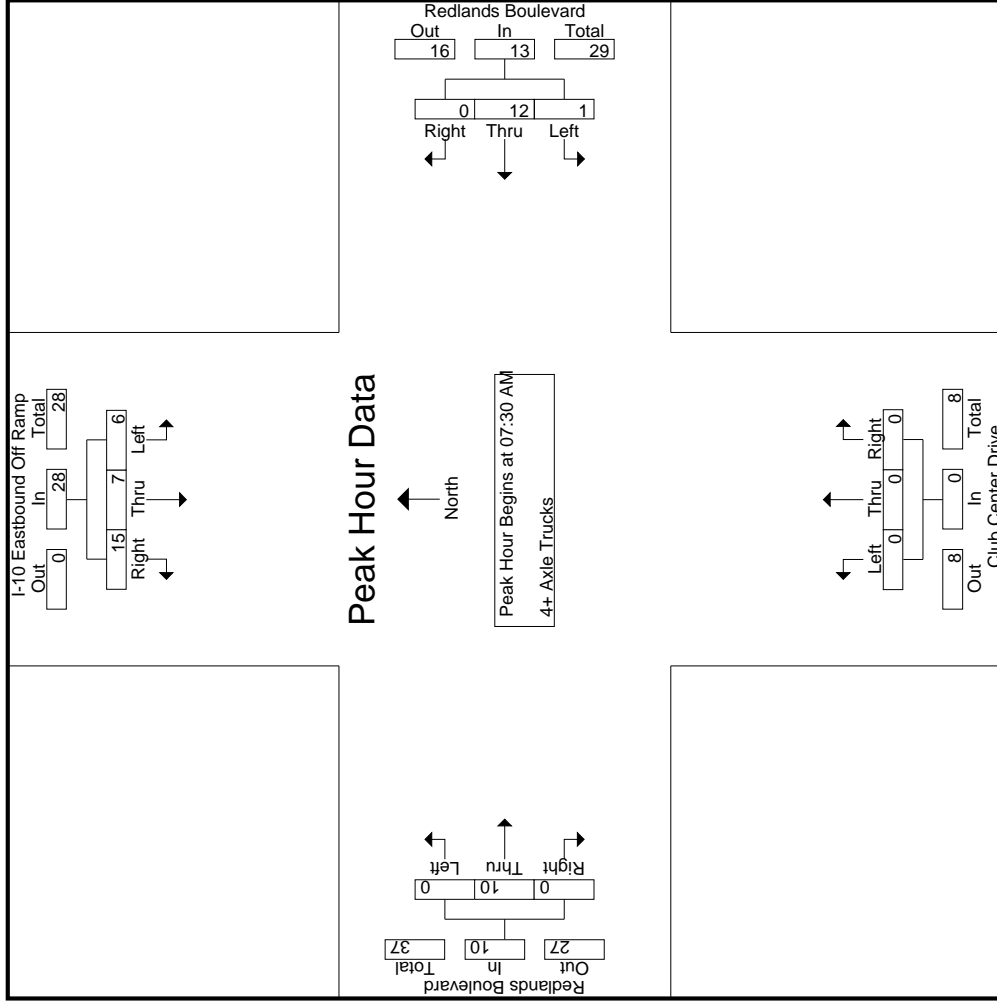
Start Time	I-10 Eastbound Off Ramp Southbound					Redlands Boulevard Westbound					Club Center Drive Northbound					Redlands Boulevard Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:30 AM	1	2	1		4	1	2	0		3	0	0	0		0	0	3	0		3	0	3	10
07:45 AM	1	1	3		5	0	4	0		4	0	0	0		0	0	1	0		1	0	1	10
08:00 AM	2	3	5		10	0	1	0		1	0	0	0		0	0	4	0		4	0	4	15
08:15 AM	2	1	6		9	0	5	0		5	0	0	0		0	0	2	0		2	0	2	16
Total Volume	6	7	15		28	1	12	0		13	0	0	0		0	0	10	0		10	0	10	51
% App. Total	21.4	25	53.6		53.6	7.7	92.3	0		0	0	0	0		0	0	100	0		100	0	100	797
PHF	.750	.583	.625		.700	.250	.600	.000		.650	.000	.000	.000		.000	.000	.625	.000		.625	.000	.625	.797

Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:30 AM

Counts Unlimited
 PO Box 1178
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 (951) 268-6268

City of San Bernardino
 N/S: I-10 EB Off Ramp/Club Center Drive
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 07-SBC10EREM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
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City of San Bernardino
 N/S: I-10 EB Off Ramp/Club Center Drive
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 07-SBC10EREM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	I-10 Eastbound Off Ramp Southbound			Redlands Boulevard Westbound			Club Center Drive Northbound			Redlands Boulevard Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1	07:30 AM													
Peak Hour for Each Approach Begins at:	07:30 AM													
+0 mins.	1	2	1	1	2	0	0	0	0	0	3	0	0	3
+15 mins.	1	1	3	0	4	0	0	0	0	0	4	1	0	1
+30 mins.	2	3	5	0	1	0	0	0	0	0	1	0	0	4
+45 mins.	2	1	6	0	5	0	0	0	0	0	5	2	0	2
Total Volume	6	7	15	1	12	0	0	0	0	0	13	10	0	10
% App. Total	21.4	25	53.6	7.7	92.3	0	0	0	0	0	100	0	0	100
PHF	.750	.583	.625	.250	.600	.000	.000	.000	.000	.000	.625	.000	.000	.625

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City of San Bernardino
 N/S: I-10 EB Off Ramp/Club Center Drive
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 07-SBC10EREP
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	I-10 Eastbound Off Ramp Southbound						Redlands Boulevard Westbound						Club Center Drive Northbound						Redlands Boulevard Eastbound						
	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	
04:00 PM	150	26	91	1	267	0	8	137	0	0	145	0	0	0	11	3	11	0	150	2	0	152	4	575	579
04:15 PM	123	26	83	0	232	0	7	152	0	0	159	0	0	14	7	14	0	148	7	2	155	9	560	569	
04:30 PM	96	30	81	1	207	0	2	112	0	0	114	0	0	22	10	22	0	144	5	3	149	14	492	506	
04:45 PM	123	31	65	0	219	0	3	142	0	0	145	0	0	15	6	15	0	136	2	1	138	7	517	524	
Total	492	113	320	2	925	0	20	543	0	0	563	0	0	62	26	62	0	578	16	6	594	34	2144	2178	
05:00 PM	120	39	73	2	232	0	8	119	0	0	127	0	0	23	13	23	0	174	4	2	178	17	560	577	
05:15 PM	109	34	66	0	209	0	2	135	0	0	137	0	0	11	8	11	0	161	4	3	165	11	522	533	
05:30 PM	113	39	52	0	204	0	8	141	0	0	149	0	0	11	5	11	0	139	2	1	141	6	505	511	
05:45 PM	114	51	74	0	239	0	8	128	0	0	136	0	0	7	3	7	0	139	5	2	144	5	526	531	
Total	456	163	265	2	884	0	26	523	0	0	549	0	0	52	29	52	0	613	15	8	628	39	2113	2152	
Grand Total	948	276	585	4	1809	0	46	1066	0	0	1112	0	0	114	55	114	0	1191	31	14	1222	73	4257	4330	
Approach %	52.4	15.3	32.3				4.1	95.9						100				97.5	2.5						
Total %	22.3	6.5	13.7		42.5		1.1	25			26.1			2.7				28	0.7				1.7	98.3	
Passenger Vehicles	937	265	535		1741		44	1039			1083			114				1141	30						
% Passenger Vehicles	98.8	96	91.5	100	96		95.7	97.5			97.4			100				95.8	96.8	92.9					
Large 2 Axle Vehicles	8	4	4		16		2	11			13			0				13	1						
% Large 2 Axle Vehicles	0.8	1.4	0.7		0.9		4.3	1			1.2			0				1.1	3.2	7.1					
3 Axle Vehicles	2	1	10		13		0	4			4			0				10	0						
% 3 Axle Vehicles	0.2	0.4	1.7		0.7		0	0.4			0.4			0				0.8	0						
4+ Axle Trucks	1	6	36		43		0	12			12			0				27	0						
% 4+ Axle Trucks	0.1	2.2	6.2		2.4		0	1.1			1.1			0				2.3	0						

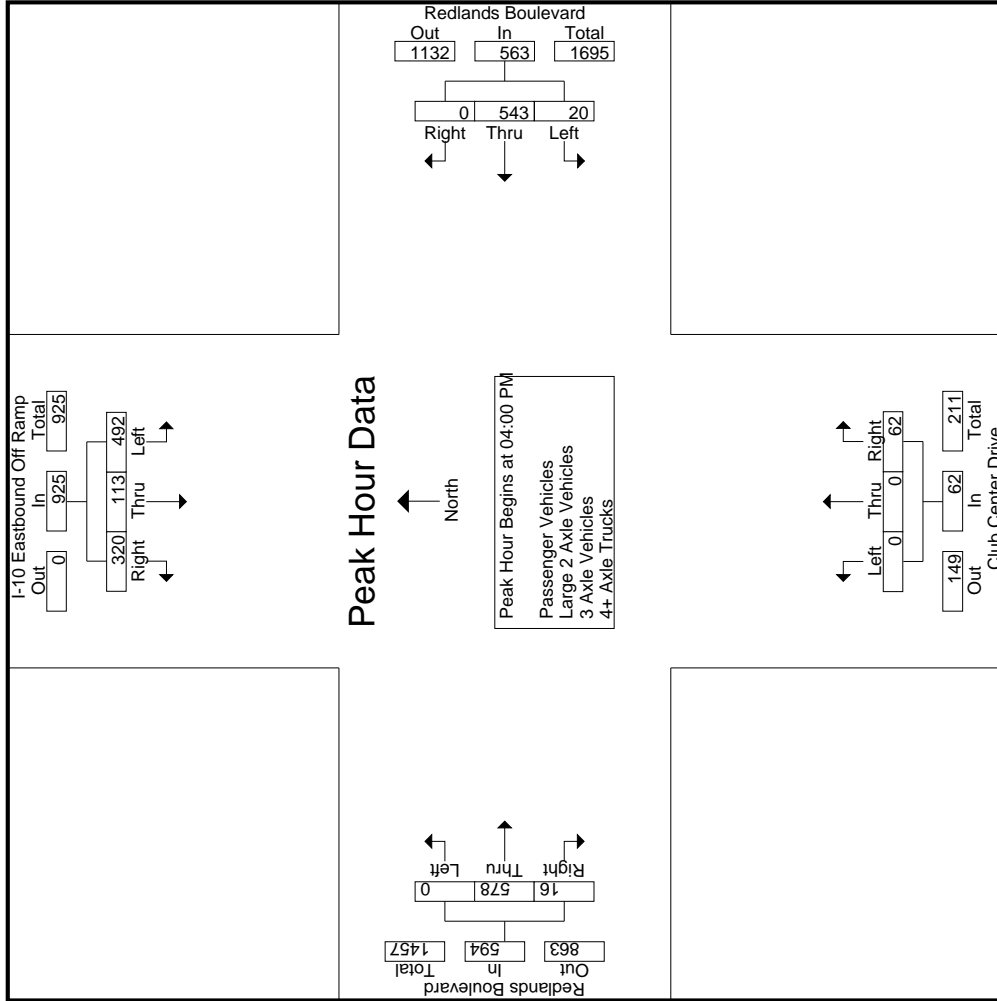
Start Time	I-10 Eastbound Off Ramp Southbound						Redlands Boulevard Westbound						Club Center Drive Northbound						Redlands Boulevard Eastbound					
	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total
04:00 PM	150	26	91	1	267	0	8	137	0	0	145	0	0	11	3	11	0	150	2	0	152	4	575	579
04:15 PM	123	26	83	0	232	0	7	152	0	0	159	0	0	14	7	14	0	148	7	2	155	9	560	569
04:30 PM	96	30	81	1	207	0	2	112	0	0	114	0	0	22	10	22	0	144	5	3	149	14	492	506
04:45 PM	123	31	65	0	219	0	3	142	0	0	145	0	0	15	6	15	0	136	2	1	138	7	517	524
Total Volume	492	113	320	2	925	0	20	543	0	0	563	0	0	62	26	62	0	578	16	6	594	34	2144	2178
% App. Total	53.2	12.2	34.6				3.6	96.4						100				97.3	2.7					
PHF	.820	.911	.879		.866		.625	.893			.000			.000	.000	.705		.963	.571				.958	.932

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:00 PM

Counts Unlimited
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City of San Bernardino
 N/S: I-10 EB Off Ramp/Club Center Drive
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 07-SBC10EREPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



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 (951) 268-6268

City of San Bernardino
 N/S: I-10 EB Off Ramp/Club Center Drive
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 07-SBC10EREP
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	I-10 Eastbound Off Ramp Southbound			Redlands Boulevard Westbound			Club Center Drive Northbound			Redlands Boulevard Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
+0 mins.	150	26	91	8	137	0	145	0	14	0	144	5	149	
+15 mins.	123	26	83	7	152	0	159	0	22	0	136	2	138	
+30 mins.	96	30	81	2	112	0	114	0	15	0	174	4	178	
+45 mins.	123	31	65	3	142	0	145	0	23	0	161	4	165	
Total Volume	492	113	320	20	543	0	563	0	74	0	615	15	630	
% App. Total	53.2	12.2	34.6	3.6	96.4	0	885	0	100	0	97.6	2.4	630	
PHF	.820	.911	.879	.625	.893	.000	.885	.000	.804	.000	.884	.750	.885	

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:00 PM			04:15 PM			04:30 PM						
	8	145	0	0	14	14	0	14	14	0	144	5	149
	7	159	0	0	22	22	0	22	22	0	136	2	138
	2	114	0	0	15	15	0	15	15	0	174	4	178
	3	145	0	0	23	23	0	23	23	0	161	4	165
	20	563	0	0	74	74	0	74	74	0	615	15	630
	3.6	96.4	0	0	100	100	0	100	100	0	97.6	2.4	630
	.625	.893	.000	.000	.804	.804	.000	.804	.804	.000	.884	.750	.885

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City of San Bernardino
 N/S: I-10 EB Off Ramp/Club Center Drive
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 07-SBC10EREPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles

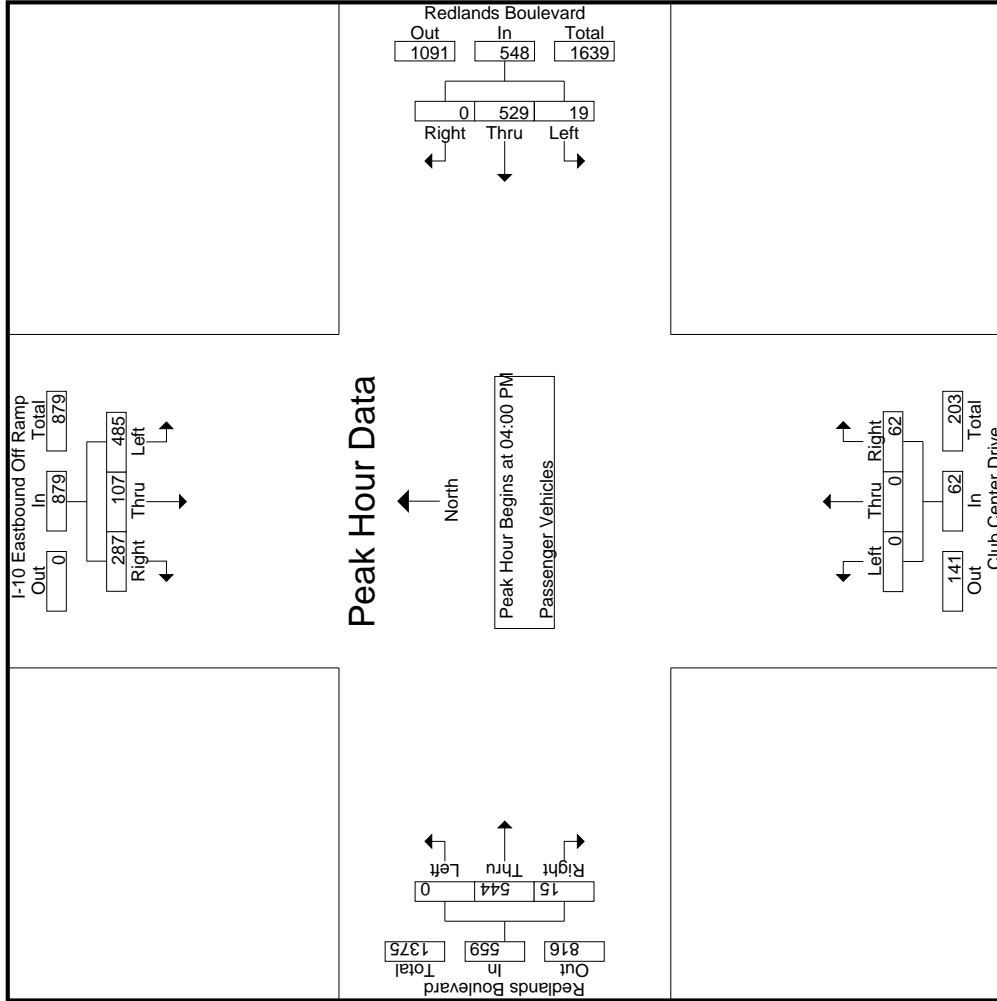
Start Time	I-10 Eastbound Off Ramp Southbound					Redlands Boulevard Westbound					Club Center Drive Northbound					Redlands Boulevard Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	147	25	84	1	256	8	132	0	0	140	0	0	11	3	11	0	144	2	0	146	4	553	557
04:15 PM	121	24	68	0	213	6	147	0	0	153	0	0	14	7	14	0	138	6	1	144	8	524	532
04:30 PM	94	28	72	1	194	2	112	0	0	114	0	0	22	10	22	0	140	5	3	145	14	475	489
04:45 PM	123	30	63	0	216	3	138	0	0	141	0	0	15	6	15	0	122	2	1	124	7	496	503
Total	485	107	287	2	879	19	529	0	0	548	0	0	62	26	62	0	544	15	5	559	33	2048	2081
05:00 PM	118	38	68	2	224	7	116	0	0	123	0	0	23	13	23	0	171	4	2	175	17	545	562
05:15 PM	108	33	59	0	200	2	132	0	0	134	0	0	11	8	11	0	158	4	3	162	11	507	518
05:30 PM	112	36	50	0	198	8	137	0	0	145	0	0	11	5	11	0	135	2	1	137	6	491	497
05:45 PM	114	51	71	0	236	8	125	0	0	133	0	0	7	3	7	0	133	5	2	138	5	514	519
Total	452	158	248	2	858	25	510	0	0	535	0	0	52	29	52	0	597	15	8	612	39	2057	2096
Grand Total	937	265	535	4	1737	44	1039	0	0	1083	0	0	114	55	114	0	1141	30	13	1171	72	4105	4177
Approach %	53.9	15.3	30.8			4.1	95.9	0			0	0	100			0	97.4	2.6		28.5	1.7	98.3	
Total %	22.8	6.5	13		42.3	1.1	25.3	0		26.4	0	0	2.8		2.8	0	27.8	0.7					

Start Time	I-10 Eastbound Off Ramp Southbound					Redlands Boulevard Westbound					Club Center Drive Northbound					Redlands Boulevard Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	147	25	84	1	256	8	132	0	0	140	0	0	11	3	11	0	144	2	0	146	4	553	557
04:15 PM	121	24	68	0	213	6	147	0	0	153	0	0	14	7	14	0	138	6	1	144	8	524	532
04:30 PM	94	28	72	1	194	2	112	0	0	114	0	0	22	10	22	0	140	5	3	145	14	475	489
04:45 PM	123	30	63	0	216	3	138	0	0	141	0	0	15	6	15	0	122	2	1	124	7	496	503
Total	485	107	287	2	879	19	529	0	0	548	0	0	62	26	62	0	544	15	5	559	33	2048	2081
05:00 PM	118	38	68	2	224	7	116	0	0	123	0	0	23	13	23	0	171	4	2	175	17	545	562
05:15 PM	108	33	59	0	200	2	132	0	0	134	0	0	11	8	11	0	158	4	3	162	11	507	518
05:30 PM	112	36	50	0	198	8	137	0	0	145	0	0	11	5	11	0	135	2	1	137	6	491	497
05:45 PM	114	51	71	0	236	8	125	0	0	133	0	0	7	3	7	0	133	5	2	138	5	514	519
Total	452	158	248	2	858	25	510	0	0	535	0	0	52	29	52	0	597	15	8	612	39	2057	2096
Grand Total	937	265	535	4	1737	44	1039	0	0	1083	0	0	114	55	114	0	1141	30	13	1171	72	4105	4177
Approach %	53.9	15.3	30.8			4.1	95.9	0			0	0	100			0	97.4	2.6		28.5	1.7	98.3	
Total %	22.8	6.5	13		42.3	1.1	25.3	0		26.4	0	0	2.8		2.8	0	27.8	0.7					

Counts Unlimited
 PO Box 1178
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City of San Bernardino
 N/S: I-10 EB Off Ramp/Club Center Drive
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 07-SBC10EREPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



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City of San Bernardino
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File Name : 07-SBC10EREPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	I-10 Eastbound Off Ramp Southbound			Redlands Boulevard Westbound			Club Center Drive Northbound			Redlands Boulevard Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:	04:00 PM													
+0 mins.	147	25	84	8	132	0	140	0	0	11	0	144	2	146
+15 mins.	121	24	68	6	147	0	153	0	0	14	0	138	6	144
+30 mins.	94	28	72	2	112	0	114	0	0	22	0	140	5	145
+45 mins.	123	30	63	3	138	0	141	0	0	15	0	122	2	124
Total Volume	485	107	287	19	529	0	548	0	0	62	0	544	15	559
% App. Total	55.2	12.2	32.7	3.5	96.5	0	89.5	0	0	100	0	97.3	2.7	95.7
PHF	.825	.892	.854	.594	.900	.000	.895	.000	.000	.705	.000	.944	.625	.957

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-10 EB Off Ramp/Club Center Drive
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 07-SBC10EREPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Large 2 Axle Vehicles

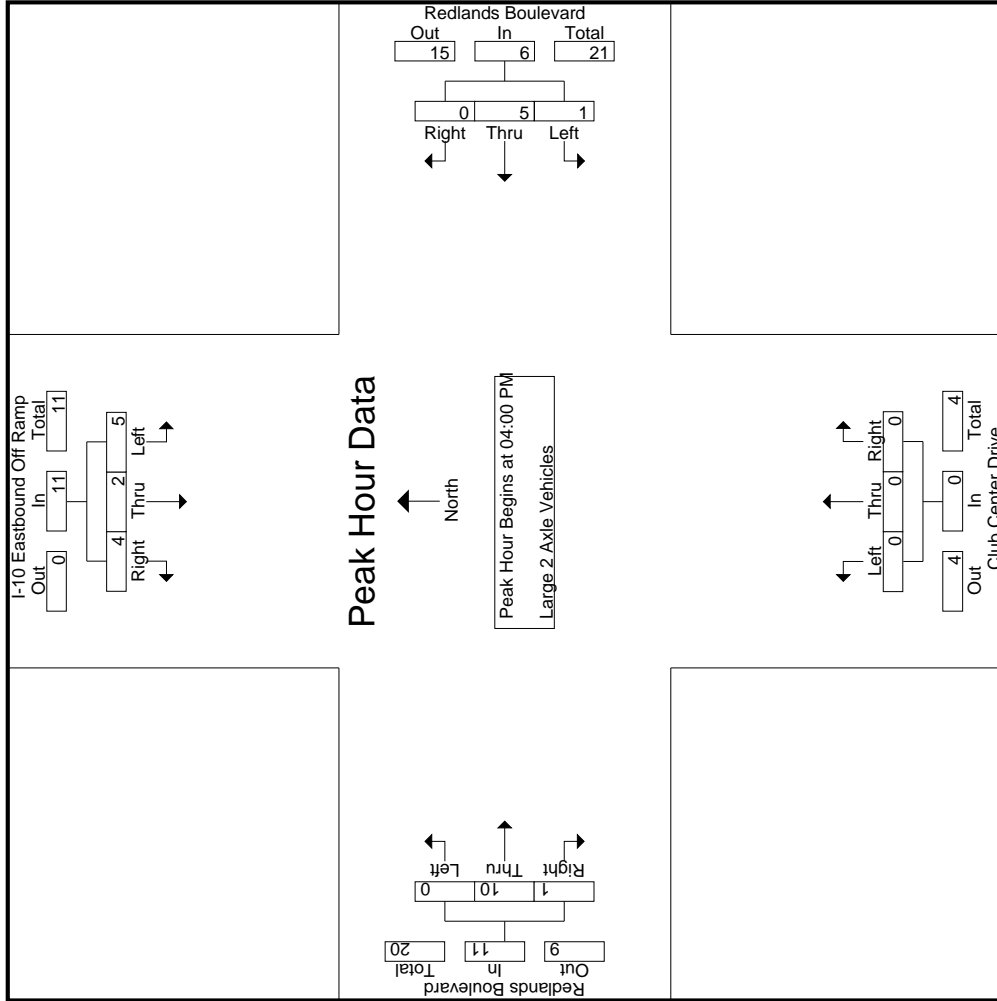
Start Time	I-10 Eastbound Off Ramp Southbound					Redlands Boulevard Westbound					Club Center Drive Northbound					Redlands Boulevard Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	2	0	3	0	5	0	3	0	0	3	0	0	0	0	0	0	3	0	0	3	0	11	11
04:15 PM	2	0	1	0	3	1	2	0	0	3	0	0	0	0	0	0	2	1	1	3	1	9	10
04:30 PM	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	3	3
04:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	0	5	5
Total	5	2	4	0	11	1	5	0	0	6	0	0	0	0	0	10	1	1	1	11	1	28	29
05:00 PM	2	0	0	0	2	1	3	0	0	4	0	0	0	0	0	0	0	0	0	0	0	6	6
05:15 PM	1	1	0	0	2	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	4	4
05:30 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	3	3
05:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	2	2
Total	3	2	0	0	5	1	6	0	0	7	0	0	0	0	0	3	0	0	3	3	0	15	15
Grand Total	8	4	4	0	16	2	11	0	0	13	0	0	0	0	0	13	1	1	1	14	1	43	44
Approach %	50	25	25		37.2	15.4	84.6	0		30.2	0	0	0		0	92.9	7.1		32.6	2.3	97.7		
Total %	18.6	9.3	9.3		37.2	4.7	25.6	0		30.2	0	0	0		0	30.2	2.3		32.6	2.3	97.7		

Start Time	I-10 Eastbound Off Ramp Southbound					Redlands Boulevard Westbound					Club Center Drive Northbound					Redlands Boulevard Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	2	0	3	0	5	0	3	0	0	3	0	0	0	0	0	0	3	0	0	3	0	11	11
04:15 PM	2	0	1	0	3	1	2	0	0	3	0	0	0	0	0	0	2	1	1	3	1	9	10
04:30 PM	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	3	3
04:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	0	5	5
Total	5	2	4	0	11	1	5	0	0	6	0	0	0	0	0	10	1	1	1	11	1	28	29
05:00 PM	2	0	0	0	2	1	3	0	0	4	0	0	0	0	0	0	0	0	0	0	0	6	6
05:15 PM	1	1	0	0	2	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	4	4
05:30 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	3	3
05:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	2	2
Total	3	2	0	0	5	1	6	0	0	7	0	0	0	0	0	3	0	0	3	3	0	15	15
Grand Total	8	4	4	0	16	2	11	0	0	13	0	0	0	0	0	13	1	1	1	14	1	43	44
Approach %	50	25	25		37.2	15.4	84.6	0		30.2	0	0	0		0	92.9	7.1		32.6	2.3	97.7		
Total %	18.6	9.3	9.3		37.2	4.7	25.6	0		30.2	0	0	0		0	30.2	2.3		32.6	2.3	97.7		

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-10 EB Off Ramp/Club Center Drive
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 07-SBC10EREPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-10 EB Off Ramp/Club Center Drive
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 07-SBC10EREPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	I-10 Eastbound Off Ramp Southbound			Redlands Boulevard Westbound			Club Center Drive Northbound			Redlands Boulevard Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	04:00 PM												04:00 PM	04:00 PM
+0 mins.	2	0	3	0	3	0	0	0	0	0	0	3	0	3
+15 mins.	2	0	1	1	2	0	0	0	0	0	2	1	1	3
+30 mins.	1	1	0	0	0	0	0	0	0	0	1	0	0	1
+45 mins.	0	1	0	0	0	0	0	0	0	0	4	0	0	4
Total Volume	5	2	4	1	5	0	0	0	0	0	10	1	11	
% App. Total	45.5	18.2	36.4	16.7	83.3	0	0	0	0	0	90.9	9.1		
PHF	.625	.500	.333	.250	.417	.000	.500	.000	.000	.000	.625	.250	.688	

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-10 EB Off Ramp/Club Center Drive
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 07-SBC10EREPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 3 Axle Vehicles

Start Time	I-10 Eastbound Off Ramp Southbound					Redlands Boulevard Westbound					Club Center Drive Northbound					Redlands Boulevard Eastbound								
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	5	0	5	0	1	0	0	1	0	0	0	0	0	0	4	0	0	4	0	0	10	10
04:30 PM	1	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
04:45 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	0	0	6	6
Total	1	0	7	0	8	0	3	0	0	3	0	0	0	0	0	8	0	0	0	8	0	19	19	19
05:00 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
05:15 PM	0	0	2	0	2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3	3
05:30 PM	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	4	4
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	1	3	0	5	0	1	0	0	1	0	0	0	0	0	2	0	0	0	2	0	8	8	8
Grand Total	2	1	10	0	13	0	4	0	0	4	0	0	0	0	0	10	0	0	0	10	0	27	27	27
Approach %	15.4	7.7	76.9			0	100	0			0	0	0			0	100	0			0	0	100	
Total %	7.4	3.7	37		48.1	0	14.8	0		14.8	0	0	0		0	37	0	0		37	0	0	100	

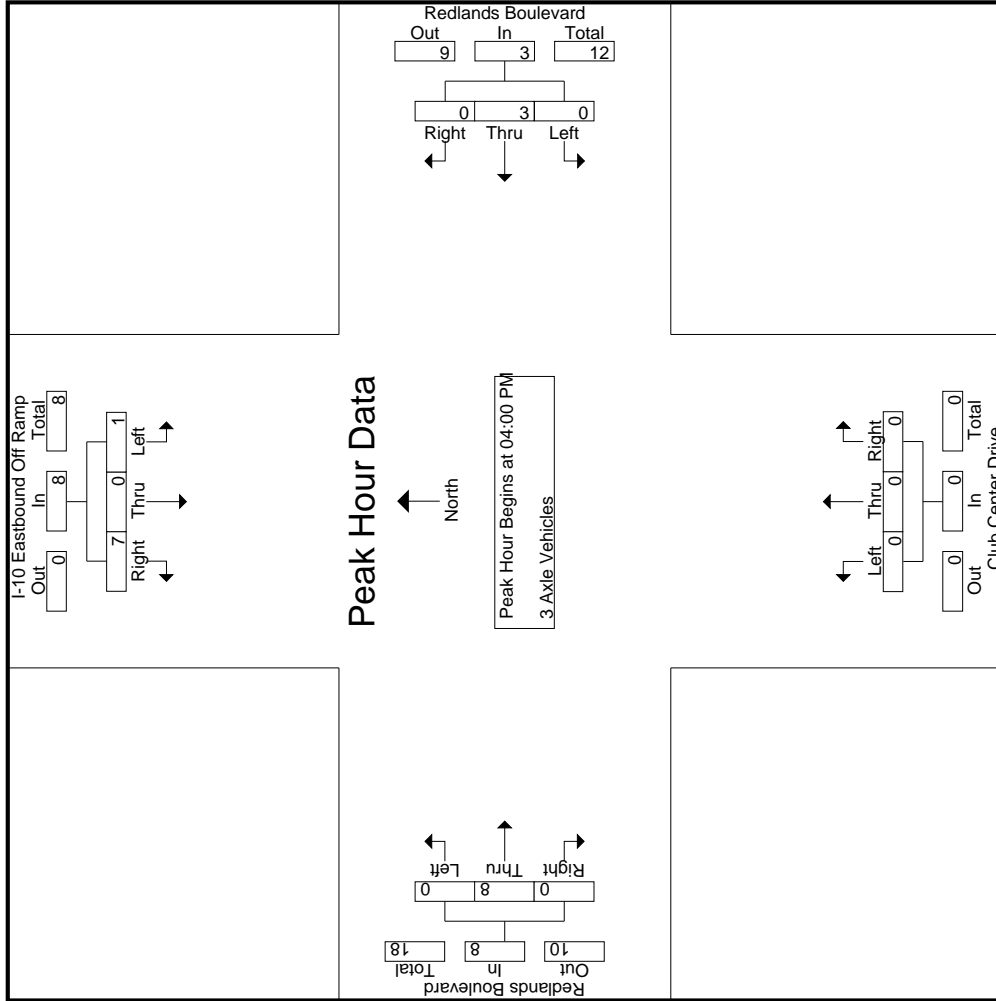
Start Time	I-10 Eastbound Off Ramp Southbound					Redlands Boulevard Westbound					Club Center Drive Northbound					Redlands Boulevard Eastbound								
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	5	0	5	0	1	0	0	1	0	0	0	0	0	0	4	0	0	4	0	0	4	10
04:30 PM	1	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
04:45 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	0	0	4	6
Total Volume	1	0	7	0	8	0	3	0	0	3	0	0	0	0	0	8	0	0	0	8	0	19	19	19
% App. Total	12.5	0	87.5			0	100	0			0	0	0			0	100	0			0	0	0	
PHF	.250	.000	.350		.400	.000	.375	.000		.375	.000	.000	.000		.000	.000	.500	.000		.500	.000	.500	.475	.475

Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:00 PM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-10 EB Off Ramp/Club Center Drive
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 07-SBC10EREPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-10 EB Off Ramp/Club Center Drive
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 07-SBC10EREPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	I-10 Eastbound Off Ramp Southbound			Redlands Boulevard Westbound			Club Center Drive Northbound			Redlands Boulevard Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1	Peak Hour for Each Approach Begins at:													
	04:00 PM													
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	5	0	1	0	0	0	0	0	0	0	4	0
+30 mins.	1	0	2	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	2	0	0	0	0	0	0	0	4	0
Total Volume	1	0	7	0	3	0	0	0	0	0	0	0	8	0
% App. Total	12.5	0	87.5	0	100	0	0	0	0	0	0	0	100	0
PHF	.250	.000	.350	.400	.000	.375	.000	.000	.000	.000	.500	.000	.500	.500

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-10 EB Off Ramp/Club Center Drive
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 07-SBC10EREP
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 4+ Axle Trucks

Start Time	I-10 Eastbound Off Ramp Southbound				Redlands Boulevard Westbound				Club Center Drive Northbound				Redlands Boulevard Eastbound				Int. Total
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	
04:00 PM	1	1	4	0	6	0	2	0	0	2	0	0	0	0	3	0	11
04:15 PM	0	2	9	0	11	0	2	0	0	2	0	0	0	0	4	0	17
04:30 PM	0	1	7	0	8	0	0	0	0	0	0	0	0	0	0	0	11
04:45 PM	0	0	2	0	2	0	2	0	0	2	0	0	0	0	6	0	10
Total	1	4	22	0	27	0	6	0	0	6	0	0	0	0	16	0	49
05:00 PM	0	1	4	0	5	0	0	0	0	0	0	0	0	0	3	0	8
05:15 PM	0	0	5	0	5	0	0	0	0	0	0	0	0	0	3	0	8
05:30 PM	0	1	2	0	3	0	4	0	0	4	0	0	0	0	0	0	7
05:45 PM	0	0	3	0	3	0	2	0	0	2	0	0	0	0	5	0	10
Total	0	2	14	0	16	0	6	0	0	6	0	0	0	0	11	0	33
Grand Total	1	6	36	0	43	0	12	0	0	12	0	0	0	0	27	0	82
Approach %	2.3	14	83.7		52.4	0	100	0	0	14.6	0	0	0	0	100	0	82
Total %	1.2	7.3	43.9			0	14.6	0	0		0	0	0	32.9	0	100	

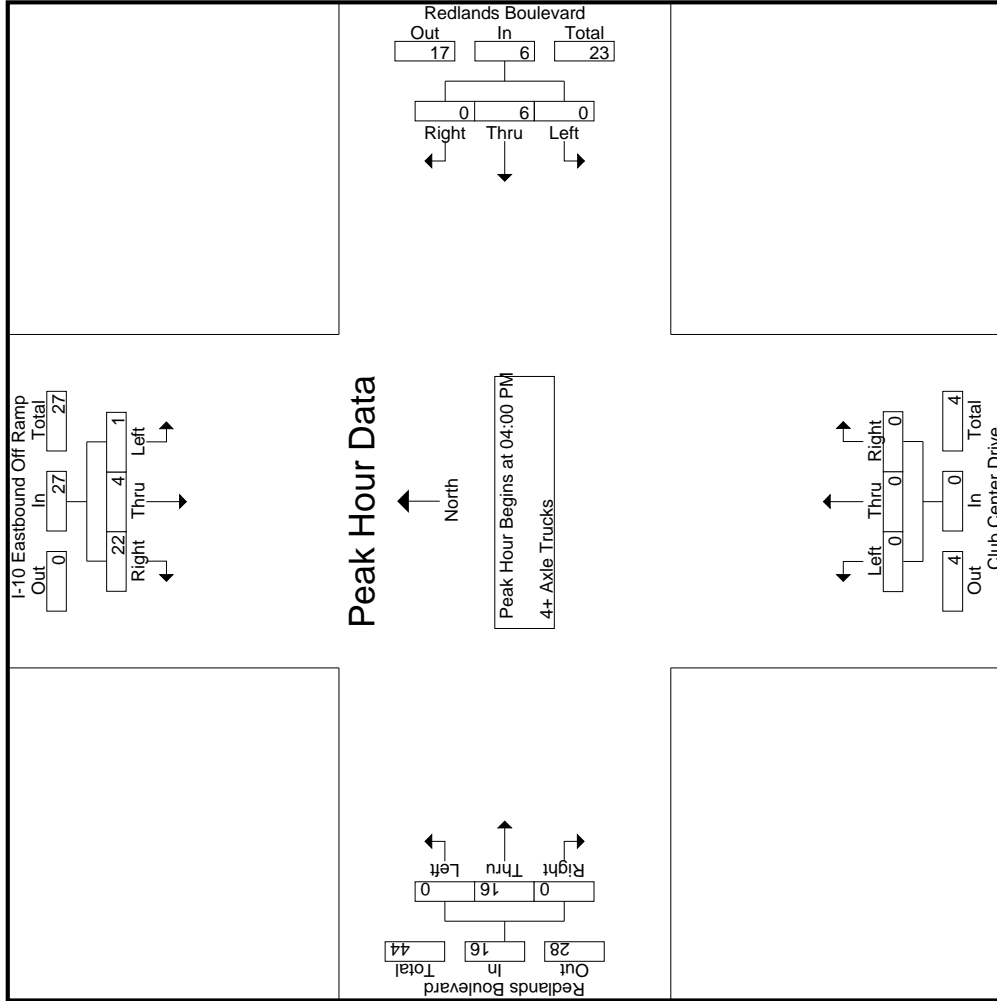
Start Time	I-10 Eastbound Off Ramp Southbound				Redlands Boulevard Westbound				Club Center Drive Northbound				Redlands Boulevard Eastbound				Int. Total
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	
04:00 PM	1	1	4		6	0	2	0		2	0	0	0		3	0	11
04:15 PM	0	2	9		11	0	2	0		2	0	0	0		4	0	17
04:30 PM	0	1	7		8	0	0	0		0	0	0	0		0	0	11
04:45 PM	0	0	2		2	0	2	0		2	0	0	0		6	0	10
Total Volume	1	4	22		27	0	6	0		6	0	0	0		16	0	49
% App. Total	3.7	14.8	81.5			0	100	0		0	0	0	0		100	0	49
PHF	.250	.500	.611		.614	.000	.750	.000		.000	.000	.000	.000		.667	.000	.721

Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:00 PM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-10 EB Off Ramp/Club Center Drive
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 07-SBC10EREPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: I-10 EB Off Ramp/Club Center Drive
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 07-SBC10EREPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	I-10 Eastbound Off Ramp Southbound			Redlands Boulevard Westbound			Club Center Drive Northbound			Redlands Boulevard Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	04:00 PM													
+0 mins.	1	1	4	0	0	0	0	0	0	0	0	0	0	3
+15 mins.	0	2	9	0	0	0	0	0	0	0	0	0	0	4
+30 mins.	0	1	7	0	0	0	0	0	0	0	0	0	0	3
+45 mins.	0	0	2	0	0	0	0	0	0	0	0	0	0	6
Total Volume	1	4	22	0	6	0	0	0	0	0	0	0	0	16
% App. Total	3.7	14.8	81.5	0	100	0	0	0	0	0	0	0	0	100
PHF	.250	.500	.611	.000	.750	.000	.000	.000	.000	.000	.000	.000	.000	.667

Location: San Bernardino
 N/S: I-10 EB Off Ramp/Club Center Drive
 E/W: Redlands Boulevard



Date: 3/2/2017
 Day: Thursday

PEDESTRIANS

	North Leg I-10 Eastbound Off Ramp	East Leg Redlands Boulevard	South Leg Club Center Drive	West Leg Redlands Boulevard	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	2	0	2
8:00 AM	0	0	3	0	3
8:15 AM	0	0	1	0	1
8:30 AM	0	0	1	0	1
8:45 AM	0	0	2	0	2
TOTAL VOLUMES:	0	0	9	0	9

	North Leg I-10 Eastbound Off Ramp	East Leg Redlands Boulevard	South Leg Club Center Drive	West Leg Redlands Boulevard	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	0	0	1	0	1
4:30 PM	0	0	1	0	1
4:45 PM	0	0	1	0	1
5:00 PM	0	0	1	0	1
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	2	0	2
TOTAL VOLUMES:	0	0	6	0	6

Location: San Bernardino
 N/S: I-10 EB Off Ramp/Club Center Drive
 E/W: Redlands Boulevard



Date: 3/2/2017
 Day: Thursday

BICYCLES

	North Leg I-10 Eastbound Off Ramp	East Leg Redlands Boulevard	South Leg Club Center Drive	West Leg Redlands Boulevard	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	1	1
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	1	1

	North Leg I-10 Eastbound Off Ramp	East Leg Redlands Boulevard	South Leg Club Center Drive	West Leg Redlands Boulevard	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 08-SBCWTORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	Waterman Avenue Southbound						Orange Show Road Westbound						Waterman Avenue Northbound						Orange Show Road Eastbound					
	Left		Right		RTOR		Left		Right		RTOR		Left		Right		RTOR		Left		Right		RTOR	
	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total
07:00 AM	22	67	16	105	7	105	10	42	7	5	59	4	98	25	10	127	25	127	33	14	185	36	476	512
07:15 AM	15	102	14	131	4	131	15	61	15	5	91	16	95	22	13	133	31	135	55	14	221	36	576	612
07:30 AM	21	129	11	161	6	161	14	65	23	10	102	7	111	15	8	133	27	122	66	26	215	50	611	661
07:45 AM	23	181	18	222	4	222	31	62	25	11	118	10	123	17	8	150	37	107	111	36	255	59	745	804
Total	81	479	59	619	21	619	70	230	70	31	370	37	427	79	39	543	120	491	265	90	876	181	2408	2589
08:00 AM	10	116	13	139	6	139	28	62	17	9	107	19	110	6	2	135	57	114	85	9	256	26	637	663
08:15 AM	10	123	28	161	10	161	12	51	15	8	78	6	122	8	5	136	35	92	65	26	192	49	567	616
08:30 AM	12	126	10	148	6	148	11	29	14	6	54	18	106	8	6	132	14	90	50	15	154	33	488	521
08:45 AM	19	127	26	172	6	172	6	46	13	11	65	19	103	5	1	127	24	69	47	10	140	28	504	532
Total	51	492	77	620	28	620	57	188	59	34	304	62	441	27	14	530	130	365	247	60	742	136	2196	2332
Grand Total	132	971	136	1239	49	1239	127	418	129	65	674	99	868	106	53	1073	250	856	512	150	1618	317	4604	4921
Approach %	10.7	78.4	11	18.8	62	19.1	2.8	9.1	2.8	14.6	9.2	80.9	9.9	2.3	23.3	5.4	18.6	11.1	35.1	1685	0	0	6.4	93.6
Total %	2.9	21.1	3	26.9	2	26.9	2.8	9.1	2.8	14.6	9.2	80.9	9.9	2.3	23.3	5.4	18.6	11.1	35.1	1685	0	0	6.4	93.6
Passenger Vehicles	127	909	111	1189	121	1189	121	388	123	693	95	825	104	1076	98.1	1076	225	807	503	100	1685	0	0	4643
% Passenger Vehicles	96.2	93.6	81.6	85.7	92.3	93.8	95.3	92.8	95.3	93.8	96.9	95	98.1	98.1	98.1	95.6	90	94.3	98.2	100	95.3	0	0	94.4
Large 2 Axle Vehicles	5	39	12	60	4	60	3	10	1	15	2	28	0	0	0	30	14	15	5	34	0	0	0	139
% Large 2 Axle Vehicles	3.8	4	8.8	4.7	2.4	4.7	2.4	2.4	0.8	1.5	2	3.2	0	0	0	2.7	5.6	1.8	1	1.9	0	0	0	2.8
3 Axle Vehicles	0	5	6	13	1	13	1	16	2	21	1	3	1	3	1	6	0	12	1	13	0	0	0	53
% 3 Axle Vehicles	0	0.5	4.4	4.1	1	4.1	0.8	3.8	1.6	3.1	2.8	1	0.3	0.9	1.9	0.5	0	1.4	0.2	0	0.7	0	0	1.1
4+ Axle Trucks	0	18	7	26	2	26	2	4	3	10	1	12	1	1	1	14	11	22	3	36	0	0	0	86
% 4+ Axle Trucks	0	1.9	5.1	2	1.6	2	1.6	1	2.3	1.5	1.4	1	1.4	0.9	0	1.2	4.4	2.6	0.6	2	0	0	0	1.7

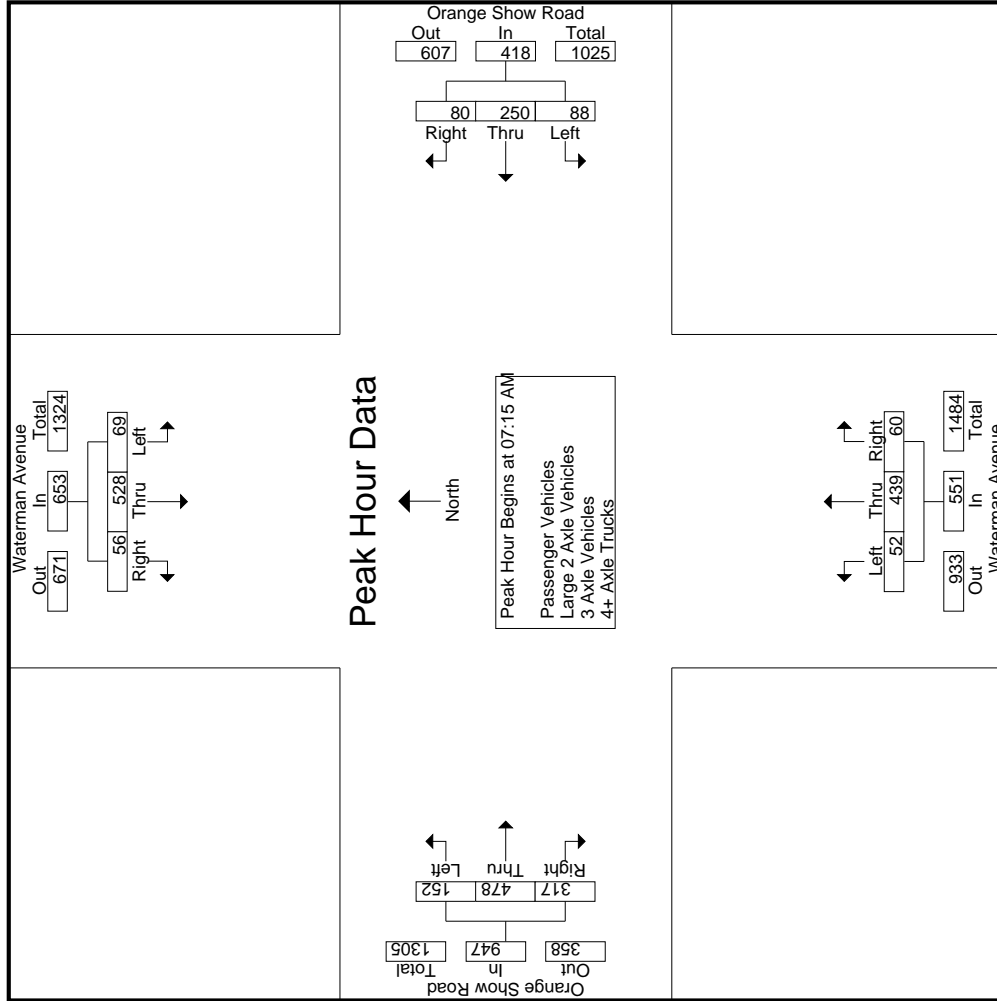
Start Time	Waterman Avenue Southbound						Orange Show Road Westbound						Waterman Avenue Northbound						Orange Show Road Eastbound					
	Left		Right		RTOR		Left		Right		RTOR		Left		Right		RTOR		Left		Right		RTOR	
	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total	Thru	App. Total
07:15 AM	15	102	14	131	15	131	15	61	15	91	16	95	22	133	31	135	55	14	221	36	476	512	36	476
07:30 AM	21	129	11	161	14	161	14	65	23	102	7	111	15	133	27	122	66	26	215	50	611	661	50	611
07:45 AM	23	181	18	222	4	222	31	62	25	118	10	123	17	150	37	107	111	36	255	59	745	804	59	745
08:00 AM	10	116	13	139	28	139	12	51	15	78	6	122	8	136	35	92	65	26	192	49	567	616	49	567
Total Volume	69	528	56	653	88	653	88	250	80	418	52	439	60	551	152	478	317	947	2569	2569	2569	2569	2569	2569
% App. Total	10.6	80.9	8.6	77.8	21.1	80.9	21.1	59.8	19.1	88.6	9.4	79.7	10.9	91.8	16.1	50.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5	33.5
PHF	.750	.729	.778	.735	.710	.962	.800	.886	.684	.892	.682	.918	.667	.714	.925	.862	.862	.862	.862	.862	.862	.862	.862	.862

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:15 AM

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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 08-SBCWTORAM
 Site Code : 05117141
 Start Date : 3/2/2017
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City of San Bernardino
 N/S: Waterman Avenue
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File Name : 08-SBCWTORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Waterman Avenue Southbound			Orange Show Road Westbound			Waterman Avenue Northbound			Orange Show Road Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1	Peak Hour for Each Approach Begins at:													
	07:30 AM													
	07:15 AM			07:30 AM			07:45 AM			08:00 AM				
+0 mins.	21	129	11	15	61	15	91	7	111	15	31	135	55	221
+15 mins.	23	181	18	14	65	23	102	10	123	17	27	122	66	215
+30 mins.	10	116	13	31	62	25	118	19	110	6	37	107	111	255
+45 mins.	10	123	28	28	62	17	107	6	122	8	57	114	85	256
Total Volume	64	549	70	88	250	80	418	42	466	46	152	478	317	947
% App. Total	9.4	80.4	10.2	21.1	59.8	19.1	7.6	84.1	8.3	16.1	50.5	33.5	33.5	94.7
PHF	.696	.758	.625	.710	.962	.800	.886	.553	.947	.676	.667	.885	.714	.925

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City of San Bernardino
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Groups Printed- Passenger Vehicles

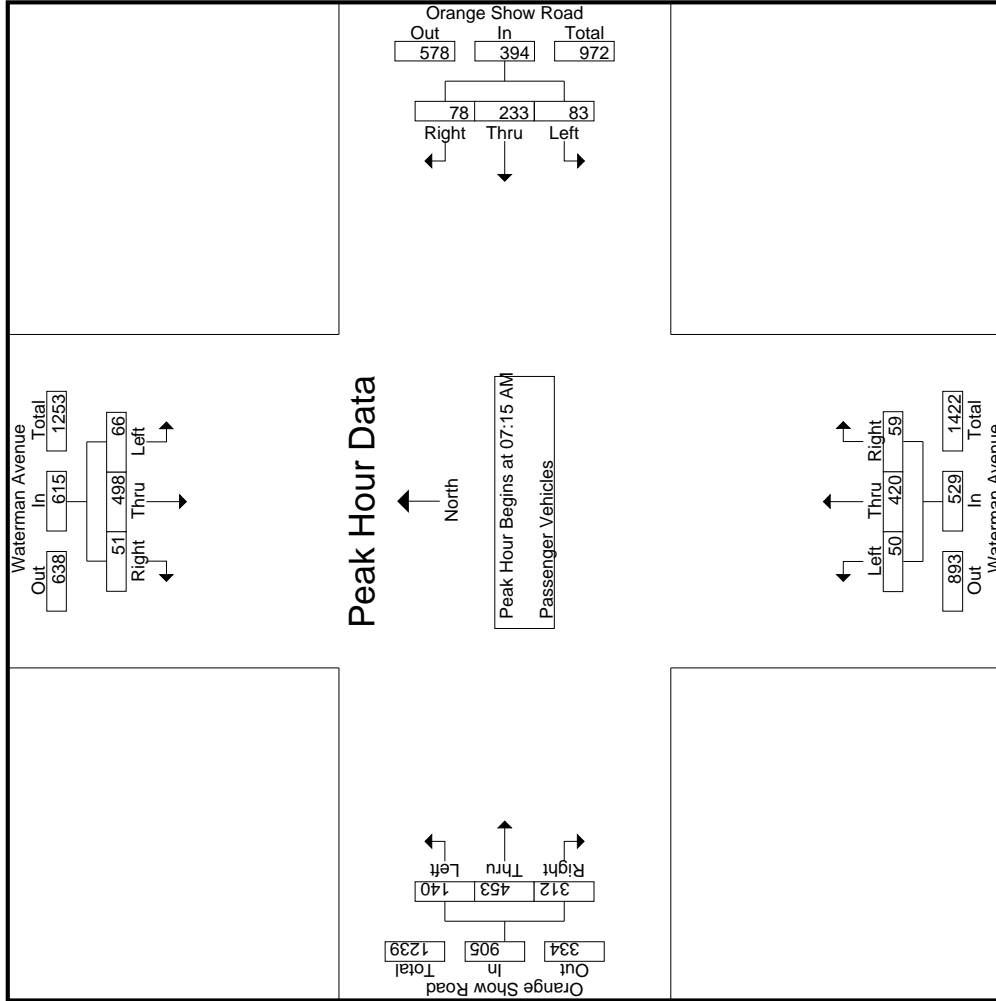
Start Time	Waterman Avenue Southbound					Orange Show Road Westbound					Waterman Avenue Northbound					Orange Show Road Eastbound					Exclu. Total	Inclu. Total	Int. Total
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total			
07:00 AM	22	59	13	6	94	9	42	6	4	57	4	92	24	9	120	23	124	32	14	179	33	450	483
07:15 AM	15	96	13	4	124	15	55	15	5	85	14	91	22	13	127	28	130	55	14	213	36	549	585
07:30 AM	20	124	10	6	154	13	60	21	9	94	7	108	14	8	129	26	111	66	26	203	49	580	629
07:45 AM	21	171	16	4	208	31	59	25	11	115	10	119	17	8	146	36	103	110	36	249	59	718	777
Total	78	450	52	20	580	68	216	67	29	351	35	410	77	38	522	113	468	263	90	844	177	2297	2474
08:00 AM	10	107	12	5	129	24	59	17	9	100	19	102	6	2	127	50	109	81	9	240	25	596	621
08:15 AM	10	113	25	10	148	12	49	14	7	75	6	118	8	5	132	28	85	64	26	177	48	532	580
08:30 AM	12	119	6	4	137	11	26	13	6	50	16	96	8	6	120	12	81	49	15	142	31	449	480
08:45 AM	17	120	16	3	153	6	38	12	10	56	19	99	5	1	123	22	64	46	10	132	24	464	488
Total	49	459	59	22	567	53	172	56	32	281	60	415	27	14	502	112	339	240	60	691	128	2041	2169
Grand Total	127	909	111	42	1147	121	388	123	61	632	95	825	104	52	1024	225	807	503	150	1535	305	4338	4643
Approach %	11.1	79.3	9.7		26.4	19.1	61.4	19.5		14.6	9.3	80.6	10.2		23.6	14.7	52.6	32.8		35.4	6.6	93.4	
Total %	2.9	21	2.6			2.8	8.9	2.8			2.2	19	2.4			5.2	18.6	11.6					

Start Time	Waterman Avenue Southbound					Orange Show Road Westbound					Waterman Avenue Northbound					Orange Show Road Eastbound						
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total		
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																						
Peak Hour for Entire Intersection Begins at 07:15 AM																						
07:15 AM	15	96	13		124	15	55	15		85	14	91		22	127	28	130	55		213	549	
07:30 AM	20	124	10		154	13	60	21		94	7	108		14	129	26	111	66		203	580	
07:45 AM	21	171	16		208	31	59	25		115	10	119		17	146	36	103	110		249	718	
08:00 AM	10	107	12		129	24	59	17		100	19	102		6	127	50	109	81		240	596	
Total Volume	66	498	51		615	83	233	78		394	50	420		59	529	140	453	312		905	2443	
% App. Total	10.7	81	8.3		8.3	21.1	59.1	19.8		19.8	9.5	79.4		11.2	34.5	15.5	50.1	34.5		34.5		
PHF	.786	.728	.797		.739	.669	.971	.780		.857	.658	.882		.670	.906	.700	.871	.709		.909		.851

Counts Unlimited
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City of San Bernardino
 N/S: Waterman Avenue
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 Site Code : 05117141
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City of San Bernardino
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File Name : 08-SBCWTORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Waterman Avenue Southbound			Orange Show Road Westbound			Waterman Avenue Northbound			Orange Show Road Eastbound			App. Total	Int. Total	
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right			
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1	Peak Hour for Each Approach Begins at:														
	07:15 AM														
+0 mins.	15	96	13	15	55	15	85	14	91	22	28	130	55	213	
+15 mins.	20	124	10	13	60	21	94	7	108	14	26	111	66	203	
+30 mins.	21	171	16	31	59	25	115	10	119	17	36	103	110	249	
+45 mins.	10	107	12	24	59	17	100	19	102	6	50	109	81	240	
Total Volume	66	498	51	83	233	78	394	50	420	59	140	453	312	905	
% App. Total	10.7	81	8.3	21.1	59.1	19.8	9.5	79.4	11.2	15.5	50.1	34.5	34.5	905	
PHF	.786	.728	.797	.669	.971	.780	.857	.658	.882	.670	.700	.871	.709	.909	

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City of San Bernardino
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 Weather: Clear

File Name : 08-SBCWTORAM
 Site Code : 05117141
 Start Date : 3/2/2017
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Groups Printed- Large 2 Axle Vehicles

Start Time	Waterman Avenue Southbound					Orange Show Road Westbound					Waterman Avenue Northbound					Orange Show Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	3	1	0	4	0	0	1	1	1	0	2	0	0	2	2	1	1	0	4	1	11	12
07:15 AM	0	5	0	0	5	0	3	0	0	3	1	2	0	0	3	1	1	0	2	0	0	13	13
07:30 AM	1	4	0	0	5	1	0	0	0	1	0	3	0	0	3	0	4	0	4	0	0	13	13
07:45 AM	2	7	0	0	9	0	0	0	0	0	3	0	0	0	3	1	0	0	1	0	0	13	13
Total	3	19	1	0	23	1	3	1	1	5	1	10	0	0	11	4	6	1	0	11	1	50	51
08:00 AM	0	7	1	1	8	2	1	0	0	3	0	4	0	0	4	5	1	2	0	8	1	23	24
08:15 AM	0	5	2	0	7	0	0	0	0	0	0	3	0	0	3	3	2	0	5	0	0	15	15
08:30 AM	0	4	1	0	5	0	1	0	0	1	1	8	0	0	9	1	3	1	0	5	0	20	20
08:45 AM	2	4	7	3	13	0	5	0	0	5	0	3	0	0	3	1	3	1	0	5	3	26	29
Total	2	20	11	4	33	2	7	0	0	9	1	18	0	0	19	10	9	4	0	23	4	84	88
Grand Total	5	39	12	4	56	3	10	1	1	14	2	28	0	0	30	14	15	5	0	34	5	134	139
Approach %	8.9	69.6	21.4			21.4	71.4	7.1			6.7	93.3	0			41.2	44.1	14.7		25.4	3.6	96.4	
Total %	3.7	29.1	9			2.2	7.5	0.7		10.4	1.5	20.9	0		22.4	10.4	11.2	3.7					

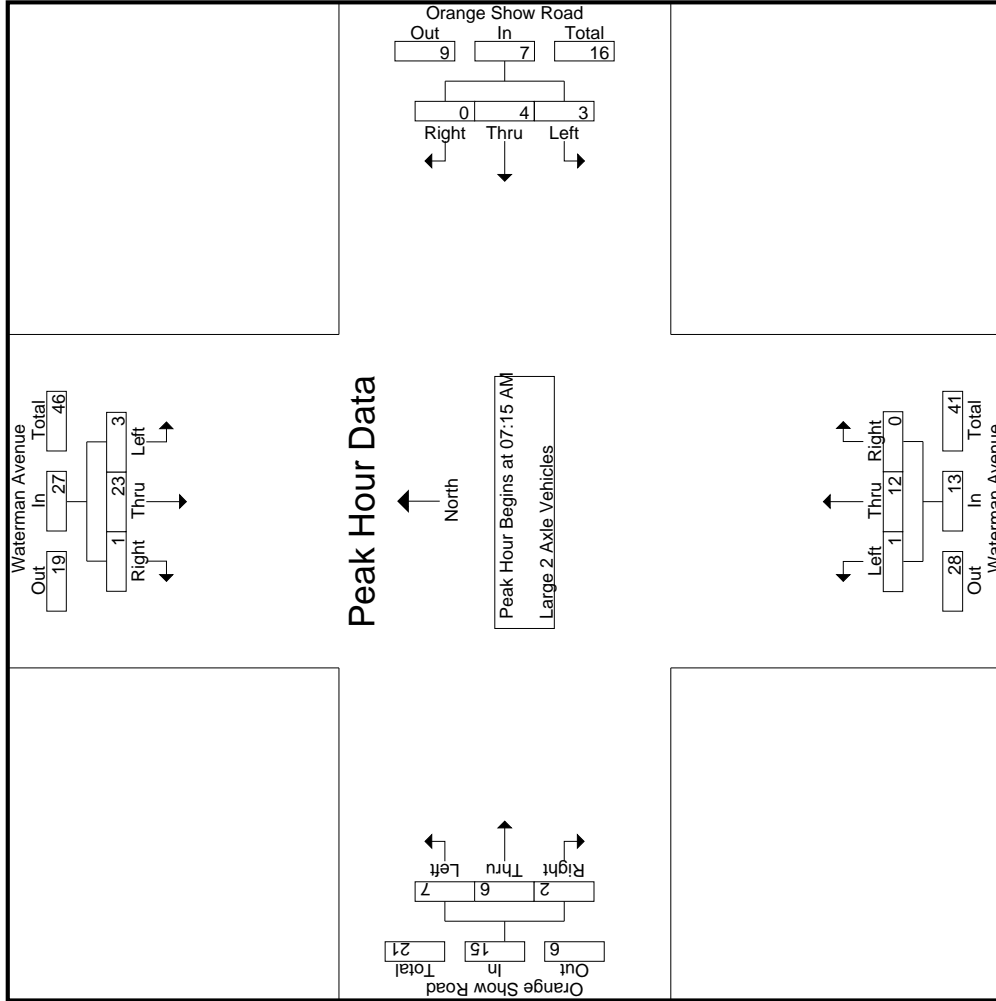
Start Time	Waterman Avenue Southbound					Orange Show Road Westbound					Waterman Avenue Northbound					Orange Show Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:15 AM	0	5	0		5	0	3	0		3	1	2	0		3	1	1	0		0	0	2	13
07:30 AM	1	4	0		5	1	0	0		1	0	3	0		3	0	4	0		0	0	4	13
07:45 AM	2	7	0		9	0	0	0		0	0	3	0		3	1	0	0		0	0	1	13
08:00 AM	0	7	1		8	2	1	1		3	0	4	0		4	5	1	2		1	2	8	23
Total Volume	3	23	1		27	3	4	0		7	1	12	0		13	7	6	2		15	2	62	
% App. Total	11.1	85.2	3.7			42.9	57.1	0			7.7	92.3	0			46.7	40	13.3					
PHF	.375	.821	.250		.750	.375	.333	.000		.583	.250	.750	.000		.813	.350	.375	.250		.469			.674

Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:15 AM

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City of San Bernardino
 N/S: Waterman Avenue
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File Name : 08-SBCWTORAM
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City of San Bernardino
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 Start Date : 3/2/2017
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Start Time	Waterman Avenue Southbound			Orange Show Road Westbound			Waterman Avenue Northbound			Orange Show Road Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	07:15 AM													
+0 mins.	0	5	0	0	3	0	0	3	2	0	0	1	0	2
+15 mins.	1	4	0	1	0	0	0	1	3	0	3	4	0	4
+30 mins.	2	7	0	0	0	0	0	0	3	1	3	0	0	1
+45 mins.	0	7	1	2	1	0	0	3	4	0	4	1	2	8
Total Volume	3	23	1	3	4	0	0	7	12	0	13	6	2	15
% App. Total	11.1	85.2	3.7	42.9	57.1	0	0	7.7	92.3	0	46.7	40	13.3	
PHF	.375	.821	.250	.375	.333	.000	.000	.583	.750	.000	.813	.375	.250	.469

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City of San Bernardino
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 Weather: Clear

File Name : 08-SBCWTORAM
 Site Code : 05117141
 Start Date : 3/2/2017
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Groups Printed- 3 Axle Vehicles

Start Time	Waterman Avenue Southbound					Orange Show Road Westbound					Waterman Avenue Northbound					Orange Show Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	1	1	1	2	0	0	0	0	0	0	0	1	1	1	0	2	0	0	2	2	5	7
07:15 AM	0	0	0	0	0	0	3	0	0	3	1	1	0	0	2	0	2	0	0	2	0	7	7
07:30 AM	0	0	1	0	1	0	5	1	1	6	0	0	0	0	0	0	2	0	0	2	1	9	10
07:45 AM	0	1	1	0	2	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	0	7	7
Total	0	2	3	1	5	0	10	1	1	11	1	1	1	1	3	0	9	0	0	9	3	28	31
08:00 AM	0	0	0	0	0	1	2	0	0	3	0	2	0	0	2	0	1	1	0	2	0	7	7
08:15 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	3	3
08:30 AM	0	1	1	1	2	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	1	4	5
08:45 AM	0	2	2	0	4	0	1	1	1	2	0	0	0	0	0	0	0	0	0	0	1	6	7
Total	0	3	3	1	6	1	6	1	1	8	0	2	0	0	2	0	3	1	0	4	2	20	22
Grand Total	0	5	6	2	11	1	16	2	2	19	1	3	1	1	5	0	12	1	0	13	5	48	53
Approach %	0	45.5	54.5		22.9	5.3	84.2	10.5		39.6	2.1	6.2	2.1		10.4	0	92.3	7.7		27.1	9.4	90.6	
Total %	0	10.4	12.5			2.1	33.3	4.2			2.1	6.2	2.1			0	25	2.1					

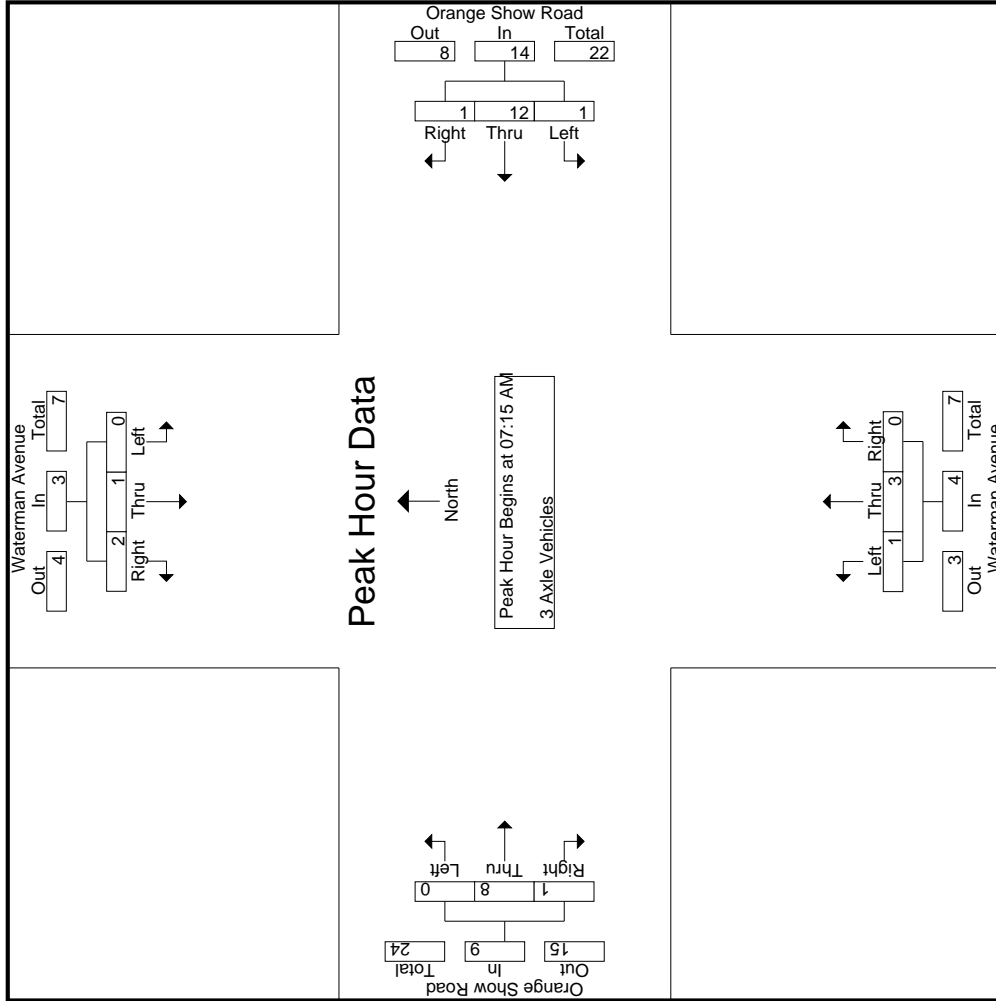
Start Time	Waterman Avenue Southbound					Orange Show Road Westbound					Waterman Avenue Northbound					Orange Show Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:15 AM	0	0	0	0	0	0	3	0	0	3	1	1	0	0	2	0	2	0	0	2	0	2	7
07:30 AM	0	0	1	1	1	0	5	1	1	6	0	0	0	0	0	0	2	0	0	2	0	2	9
07:45 AM	0	1	1	1	2	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	0	3	7
08:00 AM	0	0	0	0	0	1	2	0	0	3	0	0	2	0	2	0	1	1	0	2	0	2	7
Total Volume	0	1	2		3	1	12	1		14	1	3	0		4	0	8	1		9		30	
% App. Total	0	33.3	66.7			7.1	85.7	7.1		25	75	0			88.9	11.1							
PHF	.000	.250	.500		.375	.250	.600	.250		.583	.250	.375	.000		.500	.000	.667	.250		.750		.833	

Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:15 AM

Counts Unlimited
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City of San Bernardino
 N/S: Waterman Avenue
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File Name : 08-SBCWTORAM
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Start Time	Waterman Avenue Southbound			Orange Show Road Westbound			Waterman Avenue Northbound			Orange Show Road Eastbound				
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1	Peak Hour for Each Approach Begins at:													
	07:15 AM													
+0 mins.	0	0	0	0	3	0	3	1	0	0	2	0	2	2
+15 mins.	0	0	1	0	5	1	6	0	0	0	2	0	2	2
+30 mins.	0	1	1	0	2	0	2	0	0	0	3	0	3	3
+45 mins.	0	0	0	1	2	0	3	0	0	0	1	1	2	2
Total Volume	0	1	2	1	12	1	14	1	3	0	4	8	1	9
% App. Total	0	33.3	66.7	7.1	85.7	7.1	100.0	25	75	0	88.9	11.1	100.0	100.0
PHF	.000	.250	.500	.250	.600	.250	.583	.250	.375	.000	.500	.667	.250	.750

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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 08-SBCWTORAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 4+ Axle Trucks

Start Time	Waterman Avenue Southbound					Orange Show Road Westbound					Waterman Avenue Northbound					Orange Show Road Eastbound								
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
07:00 AM	0	4	1	0	5	1	0	0	0	1	0	4	0	0	4	0	0	0	0	0	0	10	10	10
07:15 AM	0	1	1	0	2	0	0	0	0	0	0	1	0	0	1	2	2	0	0	4	0	7	7	7
07:30 AM	0	1	0	0	1	0	0	1	0	1	0	1	0	0	1	1	5	0	0	6	0	9	9	9
07:45 AM	0	2	1	0	3	0	1	0	0	1	0	1	0	0	1	0	1	1	0	2	0	7	7	7
Total	0	8	3	0	11	1	1	1	0	3	0	6	1	0	7	3	8	1	0	12	0	33	33	33
08:00 AM	0	2	0	0	2	1	0	0	0	1	0	2	0	0	2	2	3	1	0	6	0	11	11	11
08:15 AM	0	5	1	0	6	0	0	1	1	1	0	1	0	0	1	4	4	1	0	9	1	17	18	18
08:30 AM	0	2	2	1	4	0	1	1	0	2	1	2	0	0	3	1	5	0	0	6	1	15	16	16
08:45 AM	0	1	1	0	2	0	2	0	0	2	0	1	0	0	1	1	2	0	0	3	0	8	8	8
Total	0	10	4	1	14	1	3	2	1	6	1	6	0	0	7	8	14	2	0	24	2	51	53	53
Grand Total	0	18	7	1	25	2	4	3	1	9	1	12	1	0	14	11	22	3	0	36	2	84	86	86
Approach %	0	72	28		22.2	44.4	33.3			10.7	7.1	85.7	7.1		16.7	30.6	61.1	8.3		42.9	2.3	97.7		
Total %	0	21.4	8.3		29.8	2.4	4.8	3.6			1.2	14.3	1.2			13.1	26.2	3.6						

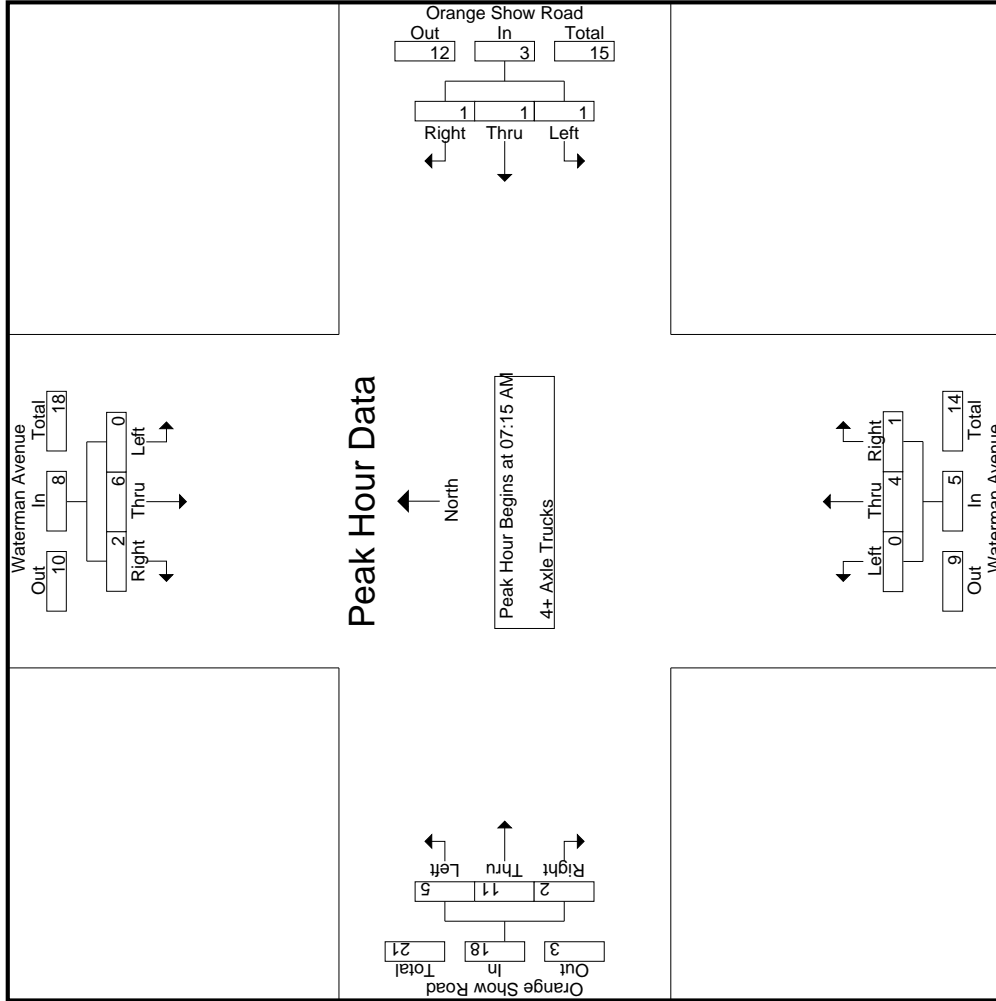
Start Time	Waterman Avenue Southbound					Orange Show Road Westbound					Waterman Avenue Northbound					Orange Show Road Eastbound								
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
07:15 AM	0	1	1	0	2	0	0	0	0	0	0	1	0	0	1	0	2	0	0	2	0	4	4	4
07:30 AM	0	1	0	0	1	0	0	0	0	1	0	1	0	0	1	1	1	0	0	5	0	6	6	6
07:45 AM	0	2	1	0	3	0	0	1	0	0	0	1	0	0	1	0	1	0	0	2	1	2	2	2
08:00 AM	0	2	0	0	2	1	0	0	0	1	0	2	0	0	2	2	3	1	0	3	1	6	6	6
Total Volume	0	6	2		8	1	1	1		3	0	4	1		5	5	11	2		18		34	34	34
% App. Total	0	.75	.25		.667	.333	.333	.333		.250	.000	.800	.200		.625	.278	.611	.111		.550		.750	.773	.773
PHF	.000	.750	.500		.667	.250	.250	.250		.750	.000	.500	.250		.625	.625	.550	.500		.750		.750	.773	.773

Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:15 AM

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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 08-SBCWTORAM
 Site Code : 05117141
 Start Date : 3/2/2017
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City of San Bernardino
 N/S: Waterman Avenue
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File Name : 08-SBCWTORAM
 Site Code : 05117141
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Start Time	Waterman Avenue Southbound			Orange Show Road Westbound			Waterman Avenue Northbound			Orange Show Road Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	07:15 AM													
+0 mins.	0	1	1	0	0	0	0	0	1	0	0	2	0	4
+15 mins.	0	1	0	0	0	1	0	0	0	1	0	1	5	6
+30 mins.	0	2	1	0	1	0	0	1	0	0	0	1	1	2
+45 mins.	0	2	0	1	0	0	1	0	2	0	2	3	1	6
Total Volume	0	6	2	1	1	1	3	0	4	1	5	11	2	18
% App. Total	.000	.750	.500	.333	.250	.333	.750	.000	.500	.250	.625	.625	.111	.750
PHF														

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City of San Bernardino
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File Name : 08-SBCWTORPM
 Site Code : 05117141
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Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	Waterman Avenue Southbound						Orange Show Road Westbound						Waterman Avenue Northbound						Orange Show Road Eastbound					
	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total
	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total
04:00 PM	14	196	22	10	232	20	146	29	10	195	27	153	9	5	189	39	142	49	17	230	42	846	888	
04:15 PM	37	173	27	13	237	22	101	18	10	141	35	164	18	11	217	35	173	54	15	262	49	857	906	
04:30 PM	33	189	26	10	248	24	127	23	9	174	50	165	18	11	233	43	201	70	12	314	42	969	1011	
04:45 PM	20	175	20	4	215	9	98	22	7	129	30	156	25	10	211	45	178	50	10	273	31	828	859	
Total	104	733	95	37	932	75	472	92	36	639	142	638	70	37	850	162	694	223	54	1079	164	3500	3664	
05:00 PM	47	187	39	13	273	18	102	17	10	137	57	181	46	15	284	30	173	42	13	245	51	939	990	
05:15 PM	29	186	20	9	235	20	95	20	7	135	58	157	33	12	248	43	242	49	15	334	43	952	995	
05:30 PM	36	188	16	5	240	29	96	14	7	139	55	199	36	16	290	43	190	34	12	267	40	936	976	
05:45 PM	30	186	18	10	234	8	78	18	12	104	34	140	27	9	201	31	217	35	11	283	42	822	864	
Total	142	747	93	37	982	75	371	69	36	515	204	677	142	52	1023	147	822	160	51	1129	176	3649	3825	
Grand Total	246	1480	188	74	1914	150	843	161	72	1154	346	1315	212	89	1873	309	1516	383	105	2208	340	7149	7489	
Approach %	12.9	77.3	9.8			13	73.1	14			18.5	70.2	11.3			14	68.7	17.3						
Total %	3.4	20.7	2.6		26.8	2.1	11.8	2.3		16.1	4.8	18.4	3		26.2	4.3	21.2	5.4		30.9	4.5	95.5		
Passenger Vehicles	239	1448	172		1932	147	801	157		1176	344	1287	209		1929	285	1442	375		2205	0	0	7242	
% Large 2 Axle Vehicles	97.2	97.8	91.5	98.6	97.2	98	95	97.5	98.6	95.9	99.4	97.9	98.6	100	98.3	92.2	95.1	97.9	98.1	95.3	0	0	96.7	
3 Axle Vehicles	3	20	6		30	2	14	1		17	0	12	1		13	9	22	6		39	0	0	99	
% 3 Axle Vehicles	1.2	1.4	3.2	1.4	1.5	1.3	1.7	0.6	0	1.4	0	0.9	0.5	0	0.7	2.9	1.5	1.6	1.9	1.7	0	0	1.3	
4+ Axle Trucks	2	2	2		6	0	12	1		13	1	4	0		5	4	14	2		20	0	0	44	
% 4+ Axle Trucks	0.8	0.1	1.1	0	0.3	0	1.4	0.6	0	1.1	0.3	0.3	0	0	0.3	1.3	0.9	0.5	0	0.9	0	0	0.6	
% App. Total	2	10	8		20	1	16	2		20	1	12	2		15	11	38	0		49	0	0	104	
PHF	0.8	0.7	4.3	0	1	0.7	1.9	1.2	1.4	1.6	0.3	0.9	0.9	0	0.8	3.6	2.5	0	0	2.1	0	0	1.4	

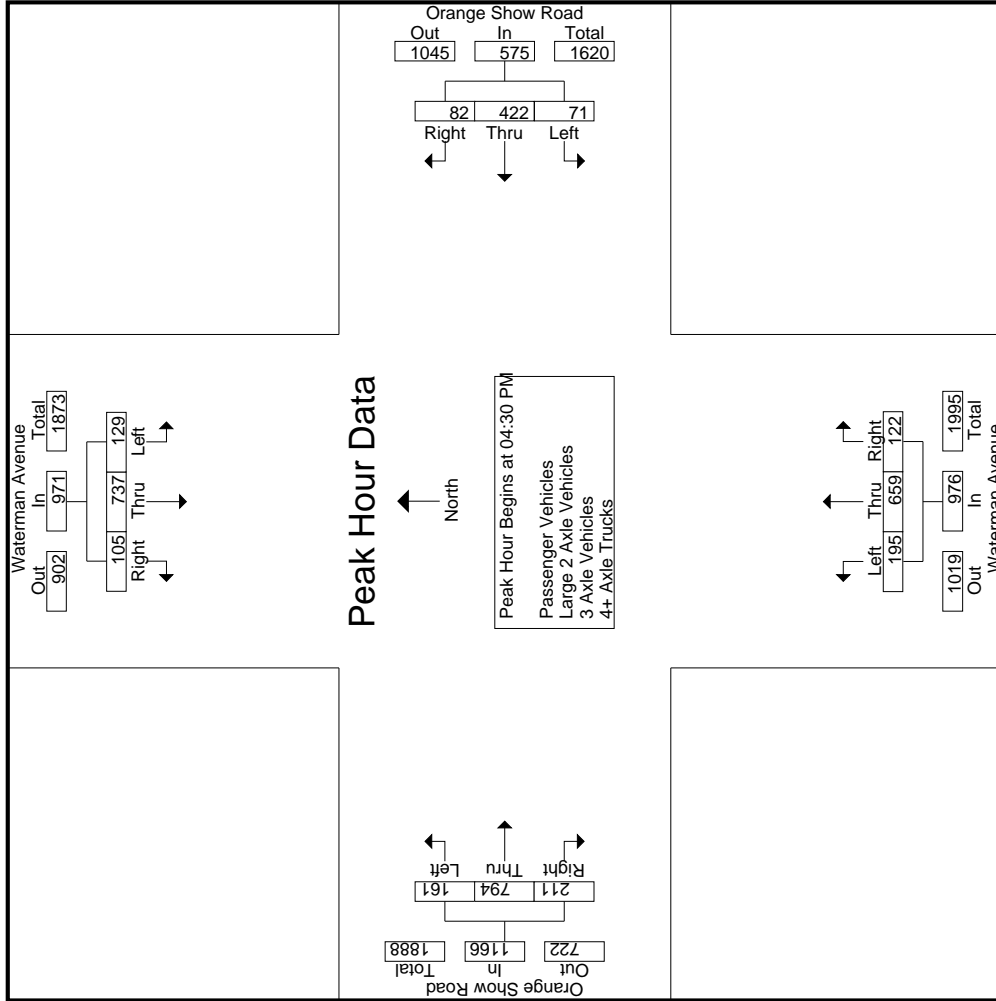
Start Time	Waterman Avenue Southbound						Orange Show Road Westbound						Waterman Avenue Northbound						Orange Show Road Eastbound					
	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total
	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total	Int. Total
04:30 PM	33	189	26		248	24	127	23		174	50	165	18		18	233	43		201	314	70	314	969	
04:45 PM	20	175	20		215	9	98	22		129	30	156	25		25	211	45		178	273	50	273	828	
05:00 PM	47	187	39		273	18	102	17		137	57	181	46		46	284	30		334	939	42	939	995	
05:15 PM	29	186	20		235	20	95	20		141	35	164	18		18	233	43		262	859	31	859	906	
Total Volume	129	737	105		971	71	422	82		575	195	659	122		122	976	161		794	211	1166	3688		
% App. Total	13.3	75.9	10.8		10.8	12.3	73.4	14.3		14.3	20	67.5	12.5		12.5	68.1	13.8		68.1	18.1	18.1	18.1	18.1	
PHF	.686	.975	.673		.889	.740	.831	.891		.826	.841	.910	.663		.663	.859	.894		.820	.754	.873	.873	.951	

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:30 PM

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City of San Bernardino
 N/S: Waterman Avenue
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File Name : 08-SBCWTORPM
 Site Code : 05117141
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City of San Bernardino
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File Name : 08-SBCWTORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Waterman Avenue Southbound				Orange Show Road Westbound				Waterman Avenue Northbound				Orange Show Road Eastbound			
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																
Peak Hour for Each Approach Begins at:																
	05:00 PM				04:00 PM				04:45 PM				04:30 PM			
+0 mins.	47	187	39	273	20	146	29	195	30	156	25	211	43	201	70	314
+15 mins.	29	186	20	235	22	101	18	141	57	181	46	284	45	178	50	273
+30 mins.	36	188	16	240	24	127	23	174	58	157	33	248	30	173	42	245
+45 mins.	30	186	18	234	9	98	22	129	55	199	36	290	43	242	49	334
Total Volume	142	747	93	982	75	472	92	639	200	693	140	1033	161	794	211	1166
% App. Total	14.5	76.1	9.5		11.7	73.9	14.4		19.4	67.1	13.6		13.8	68.1	18.1	
PHF	.755	.993	.596	.899	.781	.808	.793	.819	.862	.871	.761	.891	.894	.820	.754	.873

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City of San Bernardino
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Groups Printed- Passenger Vehicles

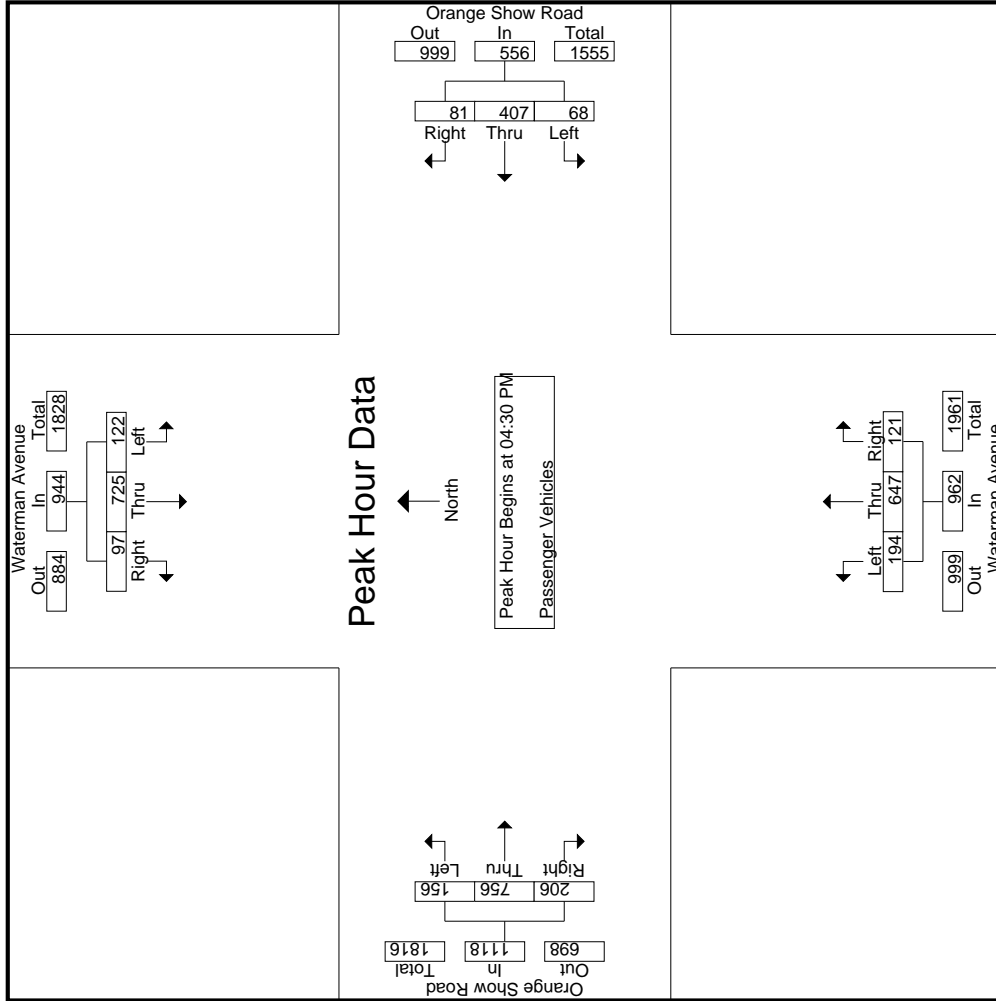
Start Time	Waterman Avenue Southbound					Orange Show Road Westbound					Waterman Avenue Northbound					Orange Show Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	14	187	18	9	219	20	139	28	10	187	27	149	9	5	185	30	137	49	17	216	41	807	848
04:15 PM	37	172	24	13	233	22	92	18	10	132	35	158	17	11	210	32	156	53	15	241	49	816	865
04:30 PM	30	185	25	10	240	21	123	23	9	167	50	160	18	11	228	41	190	69	12	300	42	935	977
04:45 PM	19	170	16	4	205	9	92	21	6	122	29	153	24	10	206	44	170	48	10	262	30	795	825
Total	100	714	83	36	897	72	446	90	35	608	141	620	68	37	829	147	653	219	54	1019	162	3353	3515
05:00 PM	47	186	37	13	270	18	98	17	10	133	57	178	46	15	281	30	165	42	13	237	51	921	972
05:15 PM	26	184	19	9	229	20	94	20	7	134	58	156	33	12	247	41	231	47	13	319	41	929	970
05:30 PM	36	183	16	5	235	29	93	14	7	136	54	193	36	16	283	37	185	34	12	256	40	910	950
05:45 PM	30	181	17	10	228	8	70	16	12	94	34	140	26	9	200	30	208	33	11	271	42	793	835
Total	139	734	89	37	962	75	355	67	36	497	203	667	141	52	1011	138	789	156	49	1083	174	3553	3727
Grand Total	239	1448	172	73	1859	147	801	157	71	1105	344	1287	209	89	1840	285	1442	375	103	2102	336	6906	7242
Approach %	12.9	77.9	9.3		26.9	13.3	72.5	14.2		16	18.7	69.9	11.4		26.6	13.6	68.6	17.8		30.4	4.6	95.4	
Total %	3.5	21	2.5		26.9	2.1	11.6	2.3		16	5	18.6	3		26.6	4.1	20.9	5.4		30.4	4.6	95.4	

Start Time	Waterman Avenue Southbound					Orange Show Road Westbound					Waterman Avenue Northbound					Orange Show Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:30 PM	30	185	25		240	21	123	23		167	50	160	18		228	41	190	69		300			935
04:45 PM	19	170	16		205	9	92	21		122	29	153	24		206	44	170	48		262			795
05:00 PM	47	186	37		270	18	98	17		133	57	178	46		281	30	165	42		319			921
05:15 PM	26	184	19		229	20	94	20		134	58	156	33		247	41	231	47		319			929
Total Volume	122	725	97		944	68	407	81		556	194	647	121		962	156	756	206		1118			3580
% App. Total	12.9	76.8	10.3		26.9	12.2	73.2	14.6		16	20.2	67.3	12.6		26.6	14	67.6	18.4		30.4			95.4
PHF	.649	.974	.655		.874	.810	.827	.880		.832	.836	.909	.658		.856	.886	.818	.746		.876			.957

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City of San Bernardino
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File Name : 08-SBCWTORPM
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Start Time	Waterman Avenue Southbound			Orange Show Road Westbound			Waterman Avenue Northbound			Orange Show Road Eastbound			App. Total	Int. Total		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right				
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1	Peak Hour for Each Approach Begins at:															
	04:30 PM															
+0 mins.	30	185	25	240	21	123	23	167	50	160	18	228	41	190	69	300
+15 mins.	19	170	16	205	9	92	21	122	29	153	24	206	44	170	48	262
+30 mins.	47	186	37	270	18	98	17	133	57	178	46	281	30	165	42	237
+45 mins.	26	184	19	229	20	94	20	134	58	156	33	247	41	231	47	319
Total Volume	122	725	97	944	68	407	81	556	194	647	121	962	156	756	206	1118
% App. Total	12.9	76.8	10.3		12.2	73.2	14.6		20.2	67.3	12.6		14	67.6	18.4	
PHF	.649	.974	.655	.874	.810	.827	.880	.832	.836	.909	.658	.856	.886	.818	.746	.876

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City of San Bernardino
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File Name : 08-SBCWTORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Large 2 Axle Vehicles

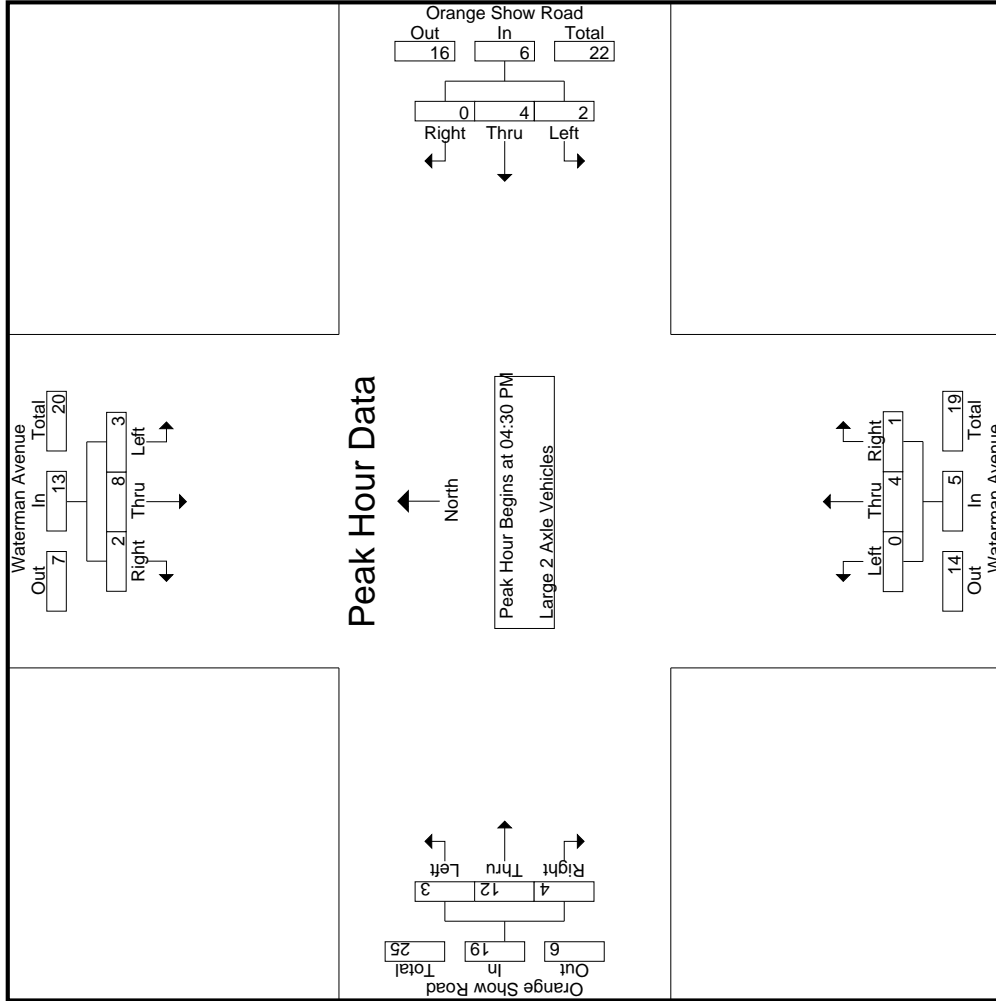
Start Time	Waterman Avenue Southbound					Orange Show Road Westbound					Waterman Avenue Northbound					Orange Show Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	5	3	1	8	0	5	1	0	6	0	2	0	0	2	3	1	0	0	4	1	20	21
04:15 PM	0	0	1	0	1	0	4	0	0	4	0	3	0	0	3	1	2	1	0	4	0	12	12
04:30 PM	1	4	1	0	6	2	1	0	0	3	0	2	0	0	2	0	4	1	0	5	0	16	16
04:45 PM	1	3	0	0	4	0	2	0	0	4	1	2	1	0	1	1	2	1	0	4	0	11	11
Total	2	12	5	1	19	2	12	1	0	15	0	7	1	0	8	5	9	3	0	17	1	59	60
05:00 PM	0	0	1	0	1	0	1	0	0	1	0	2	0	0	2	0	3	0	0	3	0	7	7
05:15 PM	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	2	3	2	2	7	2	9	11
05:30 PM	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	2	3	0	0	5	0	10	10
05:45 PM	0	5	0	0	5	0	1	0	0	1	0	0	0	0	0	0	4	1	0	5	0	11	11
Total	1	8	1	0	10	0	2	0	0	2	0	5	0	0	5	4	13	3	2	20	2	37	39
Grand Total	3	20	6	1	29	2	14	1	0	17	0	12	1	0	13	9	22	6	2	37	3	96	99
Approach %	10.3	69	20.7		11.8	82.4	5.9		7.7	92.3	0	92.3	7.7		13.5	24.3	59.5	16.2		38.5			
Total %	3.1	20.8	6.2		30.2	2.1	14.6	1		17.7	0	12.5	1			9.4	22.9	6.2			3		97

Start Time	Waterman Avenue Southbound					Orange Show Road Westbound					Waterman Avenue Northbound					Orange Show Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:30 PM	1	4	1		6	2	1	0		3	0	2	0		2	0	4	1		5	1	5	16
04:45 PM	1	3	0		4	0	2	0		2	0	0	0		1	1	2	1		4	1	4	11
05:00 PM	0	0	1		1	0	1	0		1	0	2	0		0	0	3	0		3	0	3	7
05:15 PM	1	1	0		2	0	0	0		0	0	0	0		0	2	3	2		7	2	7	9
Total Volume	3	8	2		13	2	4	0		6	0	4	0		3	12	4	4		19	4	19	43
% App. Total	23.1	61.5	15.4		15.4	33.3	66.7	0		20	0	80	20		15.8	63.2	21.1						
PHF	.750	.500	.500		.542	.250	.500	.000		.500	.000	.500	.250		.625	.375	.500	.750		.672			

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 08-SBCWTORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 08-SBCWTORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Waterman Avenue Southbound			Orange Show Road Westbound			Waterman Avenue Northbound			Orange Show Road Eastbound					
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total	
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1															
Peak Hour for Each Approach Begins at:															
	04:30 PM			04:30 PM			04:30 PM			04:30 PM			04:30 PM		
+0 mins.	1	4	1	2	1	0	0	0	2	0	0	4	1	5	
+15 mins.	1	3	0	0	2	0	0	0	0	1	1	2	1	4	
+30 mins.	0	0	1	0	1	0	0	0	2	0	0	3	0	3	
+45 mins.	1	1	0	0	0	0	0	0	0	0	0	2	2	7	
Total Volume	3	8	2	2	4	0	0	0	4	1	5	12	4	19	
% App. Total	23.1	61.5	15.4	33.3	66.7	0	0	0	80	20	15.8	63.2	21.1		
PHF	.750	.500	.500	.250	.500	.000	.000	.000	.500	.250	.375	.750	.500	.679	

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 08-SBCWTORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 3 Axle Vehicles

Start Time	Waterman Avenue Southbound					Orange Show Road Westbound					Waterman Avenue Northbound					Orange Show Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	0	5	5
04:15 PM	0	0	0	0	0	0	2	0	0	2	0	1	0	0	1	0	6	0	0	6	0	9	9
04:30 PM	1	0	0	0	1	0	2	0	0	2	0	1	0	0	1	0	1	0	0	1	0	5	5
04:45 PM	0	1	1	0	2	0	0	0	0	0	1	1	0	0	2	0	2	1	0	3	0	7	7
Total	1	1	1	0	3	0	5	0	0	5	1	3	0	0	4	4	9	1	0	14	0	26	26
05:00 PM	0	1	1	0	2	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	5	5
05:15 PM	1	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	5	5
05:30 PM	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	0	1	0	0	1	0	3	3
05:45 PM	0	0	0	0	0	0	2	1	0	3	0	0	0	0	0	0	1	1	0	2	0	5	5
Total	1	1	1	0	3	0	7	1	0	8	0	1	0	0	1	0	5	1	0	6	0	18	18
Grand Total	2	2	2	0	6	0	12	1	0	13	1	4	0	0	5	4	14	2	0	20	0	44	44
Approch %	33.3	33.3	33.3		13.6	0	92.3	7.7		29.5	20	80	0		11.4	20	70	10		45.5	0	100	
Total %	4.5	4.5	4.5			0	27.3	2.3			2.3	9.1	0			9.1	31.8	4.5			0		

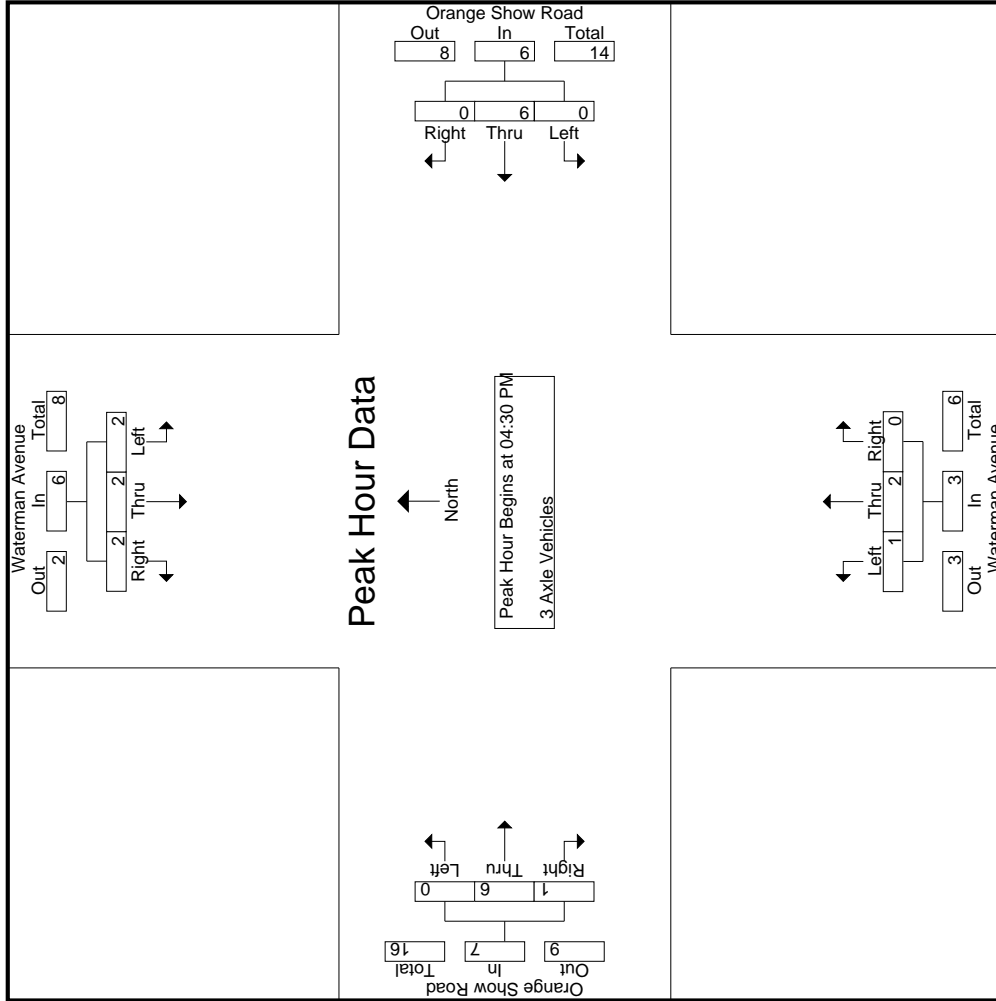
Start Time	Waterman Avenue Southbound					Orange Show Road Westbound					Waterman Avenue Northbound					Orange Show Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:30 PM	1	0	0		1	0	2	0		2	0	1	0		1	0	1	0		1	0	1	5
04:45 PM	0	1	1		2	0	0	0		0	1	1	0		2	0	2	1		3	0	7	7
05:00 PM	0	1	1		2	0	3	0		3	0	0	0		0	0	0	0		0	0	5	5
05:15 PM	1	0	0		1	0	1	0		1	0	0	0		0	0	3	0		3	0	5	5
Total Volume	2	2	2		6	0	6	6		6	1	2	0		3	0	6	1		7	0	22	22
% App. Total	33.3	33.3	33.3		33.3	0	100	66.7		66.7	33.3	66.7	0		85.7	0	85.7	14.3		7	0	22	22
PHF	.500	.500	.500		.750	.000	.500	.000		.000	.250	.500	.000		.375	.000	.500	.250		.583	0	.786	.786

Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:30 PM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 08-SBCWTORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 08-SBCWTORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Waterman Avenue Southbound			Orange Show Road Westbound			Waterman Avenue Northbound			Orange Show Road Eastbound			App. Total	Int. Total	
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right			
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1															
Peak Hour for Each Approach Begins at:															
	04:30 PM			04:30 PM			04:30 PM			04:30 PM			04:30 PM		
+0 mins.	1	0	0	1	2	0	0	0	1	0	0	0	1	0	1
+15 mins.	0	1	1	2	0	0	0	1	1	0	0	0	2	1	3
+30 mins.	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	1	0	0	1	1	0	0	0	0	0	0	0	3	0	3
Total Volume	2	2	2	6	6	0	0	1	2	0	0	0	6	1	7
% App. Total	33.3	33.3	33.3	100	100	0	0	33.3	66.7	0	0	0	85.7	14.3	7
PHF	.500	.500	.500	.750	.500	.000	.000	.250	.500	.000	.000	.000	.500	.250	.583

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 08-SBCWTORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 4+ Axle Trucks

Start Time	Waterman Avenue Southbound					Orange Show Road Westbound					Waterman Avenue Northbound					Orange Show Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	4	1	0	5	0	1	0	0	1	0	2	0	0	2	2	4	0	0	6	0	14	14
04:15 PM	0	1	2	0	3	0	3	0	0	3	0	2	1	0	3	2	9	0	0	11	0	20	20
04:30 PM	1	0	0	0	1	1	1	0	0	2	0	2	0	0	2	2	6	0	0	8	0	13	13
04:45 PM	0	1	3	0	4	0	4	1	1	5	0	2	0	0	2	0	4	0	0	4	1	15	16
Total	1	6	6	0	13	1	9	1	1	11	0	8	1	0	9	6	23	0	0	29	1	62	63
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	5	0	0	5	0	6	6
05:15 PM	1	1	1	0	3	0	0	0	0	0	0	1	0	0	1	0	5	0	0	5	0	9	9
05:30 PM	0	3	0	0	3	0	2	0	0	2	1	2	0	0	3	4	1	0	0	5	0	13	13
05:45 PM	0	0	1	0	1	0	5	1	0	6	0	0	1	0	1	1	4	0	0	5	0	13	13
Total	1	4	2	0	7	0	7	1	0	8	1	4	1	0	6	5	15	0	0	20	0	41	41
Grand Total	2	10	8	0	20	1	16	2	1	19	1	12	2	0	15	11	38	0	0	49	1	103	104
Approach %	10	50	40		5.3	84.2	10.5			18.4	6.7	80	13.3		14.6	22.4	77.6	0		47.6			
Total %	1.9	9.7	7.8		19.4	1	15.5	1.9			1	11.7	1.9			10.7	36.9	0					

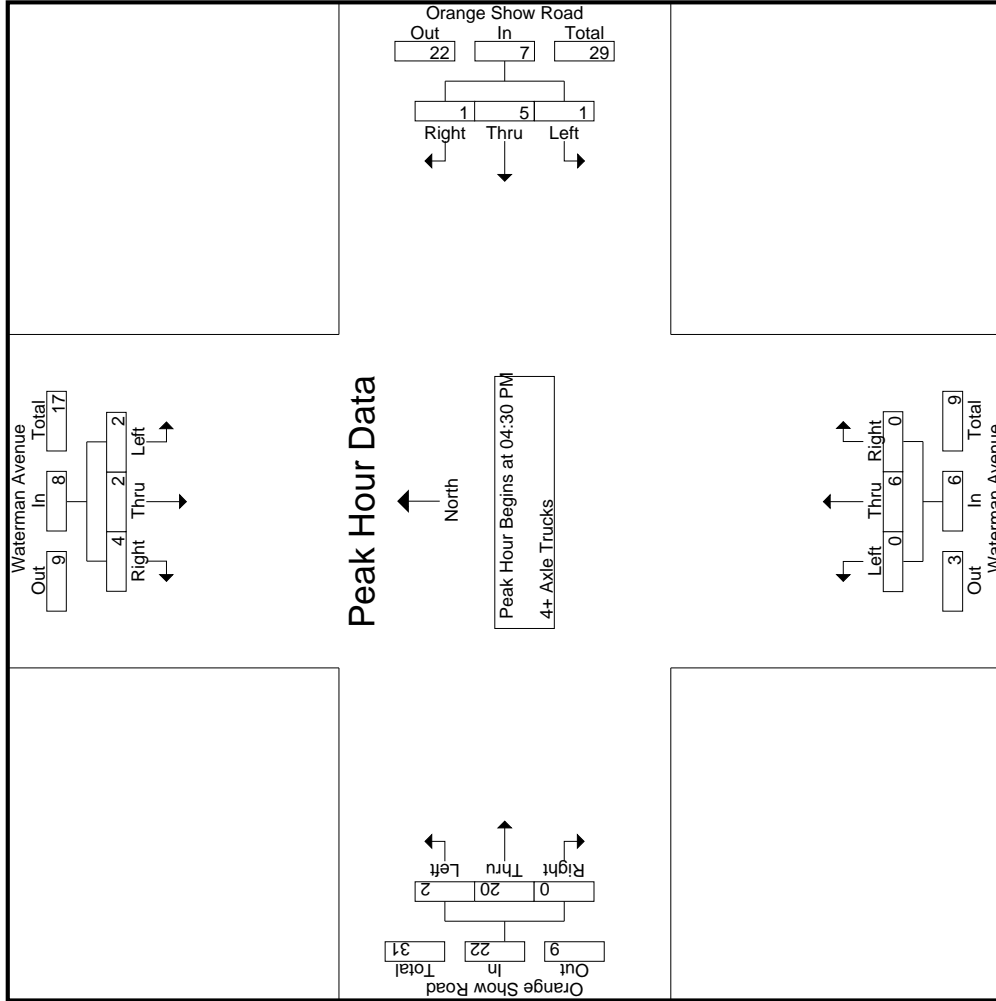
Start Time	Waterman Avenue Southbound					Orange Show Road Westbound					Waterman Avenue Northbound					Orange Show Road Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:30 PM	1	0	0		1	1	1	0		2	0	2	0		2	2	6	0		8			13
04:45 PM	0	1	3		4	0	4	1		5	0	5	2		2	0	4	0		4			15
05:00 PM	0	0	0		0	0	0	0		0	0	0	1		1	0	5	0		5			6
05:15 PM	1	1	1		3	0	0	0		0	0	0	1		1	0	5	0		5			6
Total Volume	2	2	4		8	1	5	1		7	0	6	6		6	2	20	0		22			43
% App. Total	.25	.25	.50		.500	.14.3	.71.4	.14.3		.250	.000	.100	.90.9		.000	.9.1	.90.9	.000		.688			.717
PHF	.500	.500	.333		.500	.250	.313	.250		.350	.000	.750	.000		.750	.250	.833	.000		.688			.717

Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:30 PM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 08-SBCWTORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Orange Show Road
 Weather: Clear

File Name : 08-SBCWTORPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Waterman Avenue Southbound			Orange Show Road Westbound			Waterman Avenue Northbound			Orange Show Road Eastbound					
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total	
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1															
Peak Hour for Each Approach Begins at:															
	04:30 PM			04:30 PM			04:30 PM			04:30 PM			04:30 PM		
+0 mins.	1	0	0	1	1	0	2	0	2	0	2	0	6	0	8
+15 mins.	0	1	3	4	4	1	5	0	2	0	2	0	4	0	4
+30 mins.	0	0	0	0	0	0	0	0	1	0	1	0	5	0	5
+45 mins.	1	1	1	3	0	0	0	0	1	0	1	0	5	0	5
Total Volume	2	2	4	8	5	1	7	0	6	0	6	2	20	0	22
% App. Total	25	25	50	14.3	71.4	14.3	35.0	0	100	0	100	9.1	90.9	0	22
PHF	.500	.500	.333	.500	.313	.250	.350	.000	.750	.000	.750	.250	.833	.000	.688

Location: San Bernardino
 N/S: Waterman Avenue
 E/W: Orange Show Road



Date: 3/2/2017
 Day: Thursday

PEDESTRIANS

	North Leg Waterman Avenue	East Leg Orange Show Road	South Leg Waterman Avenue	West Leg Orange Show Road	TOTAL
7:00 AM	1	0	2	0	3
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	1	0	0	0	1
8:30 AM	0	0	0	0	0
8:45 AM	0	1	0	0	1
TOTAL VOLUMES:	2	1	2	0	5

	North Leg Waterman Avenue	East Leg Orange Show Road	South Leg Waterman Avenue	West Leg Orange Show Road	TOTAL
4:00 PM	0	1	0	1	2
4:15 PM	0	0	1	0	1
4:30 PM	0	0	1	0	1
4:45 PM	0	0	0	0	0
5:00 PM	0	1	0	0	1
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	2	2	1	5

Location: San Bernardino
 N/S: Waterman Avenue
 E/W: Orange Show Road



Date: 3/2/2017
 Day: Thursday

BICYCLES

	North Leg Waterman Avenue	East Leg Orange Show Road	South Leg Waterman Avenue	West Leg Orange Show Road	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	1	0	0	1
8:30 AM	0	0	1	0	1
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	0	1	1	0	2

	North Leg Waterman Avenue	East Leg Orange Show Road	South Leg Waterman Avenue	West Leg Orange Show Road	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	1	1	0	0	2
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	1	0	1
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	1	1
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	1	1	1	1	4

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 09-SBCWTDUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

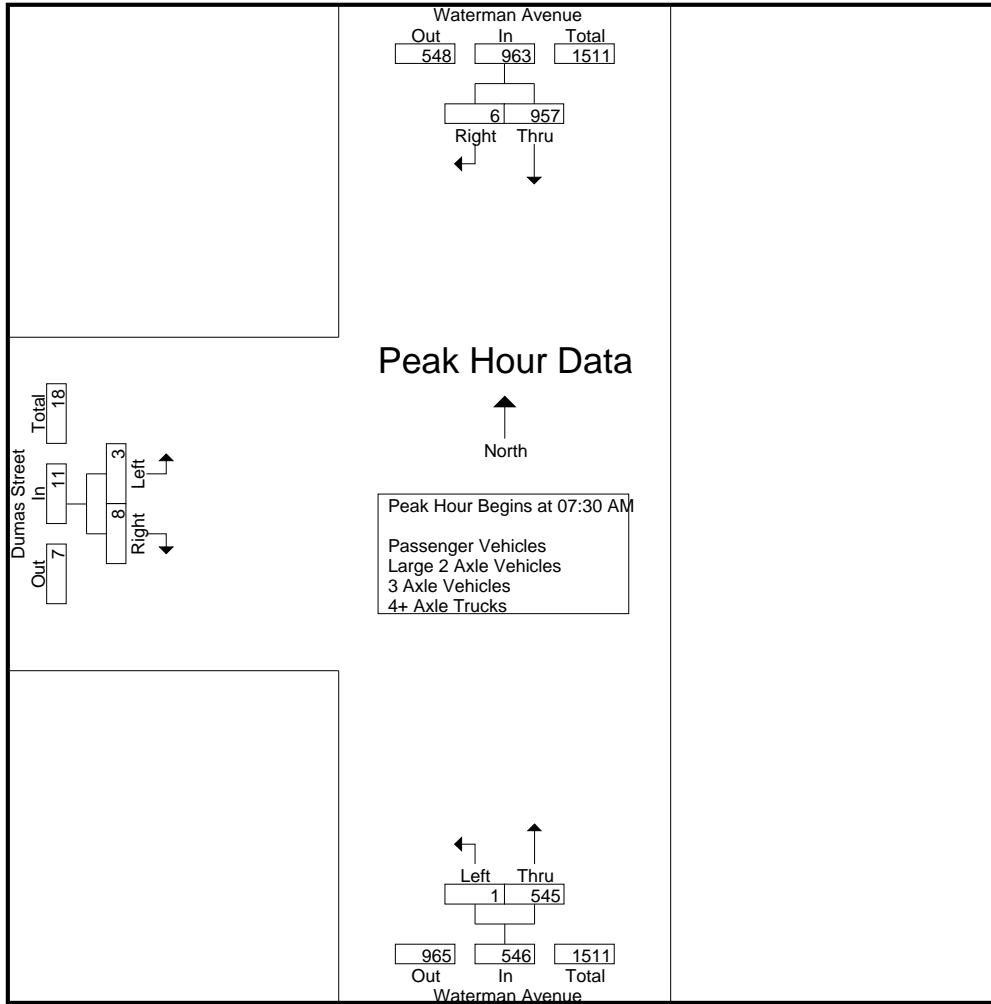
Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	Waterman Avenue Southbound				Waterman Avenue Northbound				Dumas Street Eastbound				Exclu. Total	Inclu. Total	Int. Total
	Thru	Right	RTOR	App. Total	Left	Thru	RTOR	App. Total	Left	Right	RTOR	App. Total			
07:00 AM	112	1	0	113	0	124	0	124	1	1	0	2	0	239	239
07:15 AM	173	1	0	174	1	135	0	136	0	3	0	3	0	313	313
07:30 AM	210	1	0	211	0	126	0	126	0	1	0	1	0	338	338
07:45 AM	321	2	0	323	0	149	0	149	1	4	0	5	0	477	477
Total	816	5	0	821	1	534	0	535	2	9	0	11	0	1367	1367
08:00 AM	222	3	0	225	0	141	0	141	1	2	0	3	0	369	369
08:15 AM	204	0	0	204	1	129	0	130	1	1	0	2	0	336	336
08:30 AM	184	2	0	186	2	134	0	136	2	6	0	8	0	330	330
08:45 AM	181	2	0	183	2	127	0	129	1	0	0	1	0	313	313
Total	791	7	0	798	5	531	0	536	5	9	0	14	0	1348	1348
Grand Total	1607	12	0	1619	6	1065	0	1071	7	18	0	25	0	2715	2715
Apprch %	99.3	0.7			0.6	99.4			28	72					
Total %	59.2	0.4		59.6	0.2	39.2		39.4	0.3	0.7		0.9	0	100	
Passenger Vehicles	1518	8		1526	5	1009		1014	7	15		22	0	0	2562
% Passenger Vehicles	94.5	66.7	0	94.3	83.3	94.7	0	94.7	100	83.3	0	88	0	0	94.4
Large 2 Axle Vehicles	58	4		62	0	37		37	0	2		2	0	0	101
% Large 2 Axle Vehicles	3.6	33.3	0	3.8	0	3.5	0	3.5	0	11.1	0	8	0	0	3.7
3 Axle Vehicles	8	0		8	0	5		5	0	0		0	0	0	13
% 3 Axle Vehicles	0.5	0	0	0.5	0	0.5	0	0.5	0	0	0	0	0	0	0.5
4+ Axle Trucks	23	0		23	1	14		15	0	1		1	0	0	39
% 4+ Axle Trucks	1.4	0	0	1.4	16.7	1.3	0	1.4	0	5.6	0	4	0	0	1.4

Start Time	Waterman Avenue Southbound			Waterman Avenue Northbound			Dumas Street Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	210	1	211	0	126	126	0	1	1	338
07:45 AM	321	2	323	0	149	149	1	4	5	477
08:00 AM	222	3	225	0	141	141	1	2	3	369
08:15 AM	204	0	204	1	129	130	1	1	2	336
Total Volume	957	6	963	1	545	546	3	8	11	1520
% App. Total	99.4	0.6		0.2	99.8		27.3	72.7		
PHF	.745	.500	.745	.250	.914	.916	.750	.500	.550	.797

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 09-SBCWTDUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:30 AM			07:45 AM			07:45 AM		
+0 mins.	210	1	211	0	149	149	1	4	5
+15 mins.	321	2	323	0	141	141	1	2	3
+30 mins.	222	3	225	1	129	130	1	1	2
+45 mins.	204	0	204	2	134	136	2	6	8
Total Volume	957	6	963	3	553	556	5	13	18
% App. Total	99.4	0.6		0.5	99.5		27.8	72.2	
PHF	.745	.500	.745	.375	.928	.933	.625	.542	.563

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 09-SBCWTDUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles

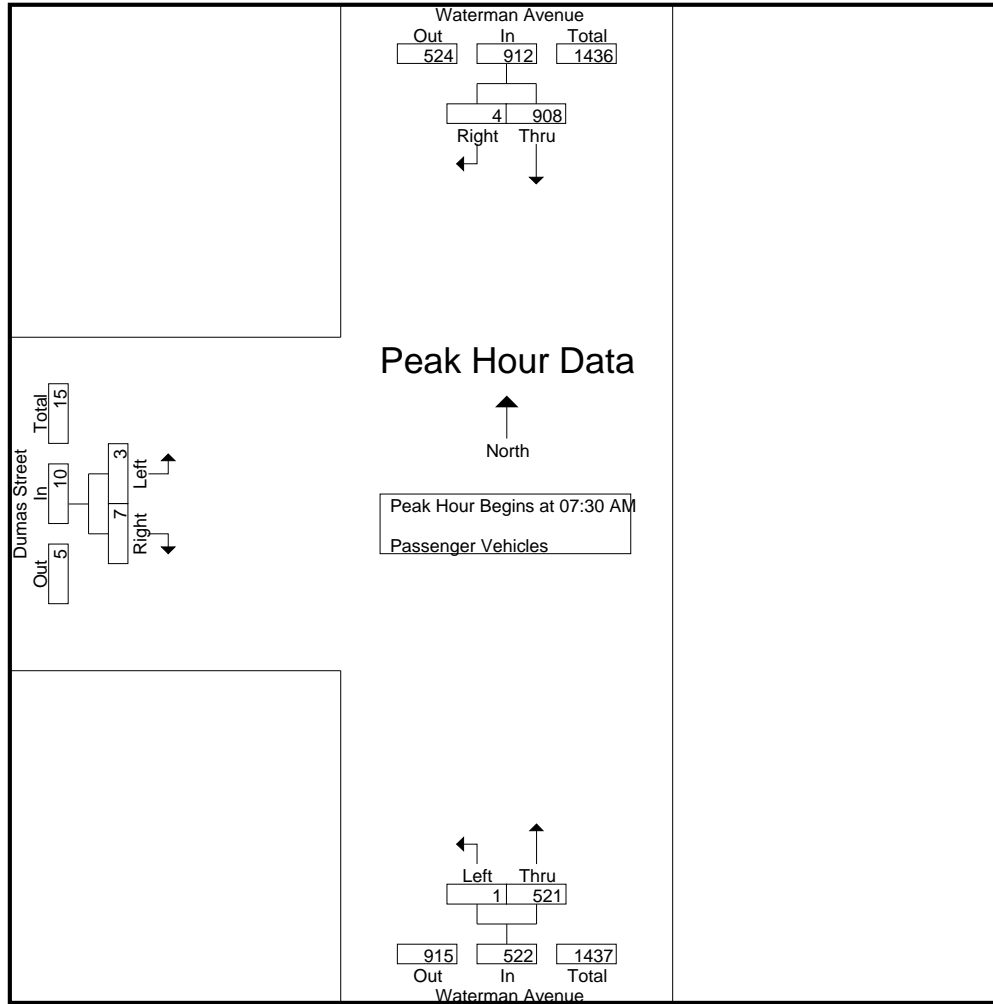
Start Time	Waterman Avenue Southbound				Waterman Avenue Northbound				Dumas Street Eastbound				Exclu. Total	Inclu. Total	Int. Total
	Thru	Right	RTOR	App. Total	Left	Thru	RTOR	App. Total	Left	Right	RTOR	App. Total			
07:00 AM	100	0	0	100	0	114	0	114	1	1	0	2	0	216	216
07:15 AM	164	0	0	164	0	128	0	128	0	3	0	3	0	295	295
07:30 AM	203	0	0	203	0	122	0	122	0	1	0	1	0	326	326
07:45 AM	311	2	0	313	0	144	0	144	1	3	0	4	0	461	461
Total	778	2	0	780	0	508	0	508	2	8	0	10	0	1298	1298
08:00 AM	204	2	0	206	0	132	0	132	1	2	0	3	0	341	341
08:15 AM	190	0	0	190	1	123	0	124	1	1	0	2	0	316	316
08:30 AM	174	2	0	176	2	123	0	125	2	4	0	6	0	307	307
08:45 AM	172	2	0	174	2	123	0	125	1	0	0	1	0	300	300
Total	740	6	0	746	5	501	0	506	5	7	0	12	0	1264	1264
Grand Total	1518	8	0	1526	5	1009	0	1014	7	15	0	22	0	2562	2562
Apprch %	99.5	0.5			0.5	99.5			31.8	68.2					
Total %	59.3	0.3		59.6	0.2	39.4		39.6	0.3	0.6		0.9	0	100	

Start Time	Waterman Avenue Southbound			Waterman Avenue Northbound			Dumas Street Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
07:30 AM	203	0	203	0	122	122	0	1	1	326
07:45 AM	311	2	313	0	144	144	1	3	4	461
08:00 AM	204	2	206	0	132	132	1	2	3	341
08:15 AM	190	0	190	1	123	124	1	1	2	316
Total Volume	908	4	912	1	521	522	3	7	10	1444
% App. Total	99.6	0.4		0.2	99.8		30	70		
PHF	.730	.500	.728	.250	.905	.906	.750	.583	.625	.783

Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:30 AM

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 09-SBCWTDUAM
 Site Code : 05117141
 Start Date : 3/2/2017
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Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:30 AM			07:30 AM			07:30 AM		
+0 mins.	203	0	203	0	122	122	0	1	1
+15 mins.	311	2	313	0	144	144	1	3	4
+30 mins.	204	2	206	0	132	132	1	2	3
+45 mins.	190	0	190	1	123	124	1	1	2
Total Volume	908	4	912	1	521	522	3	7	10
% App. Total	99.6	0.4		0.2	99.8		30	70	
PHF	.730	.500	.728	.250	.905	.906	.750	.583	.625

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 09-SBCWTDUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Large 2 Axle Vehicles

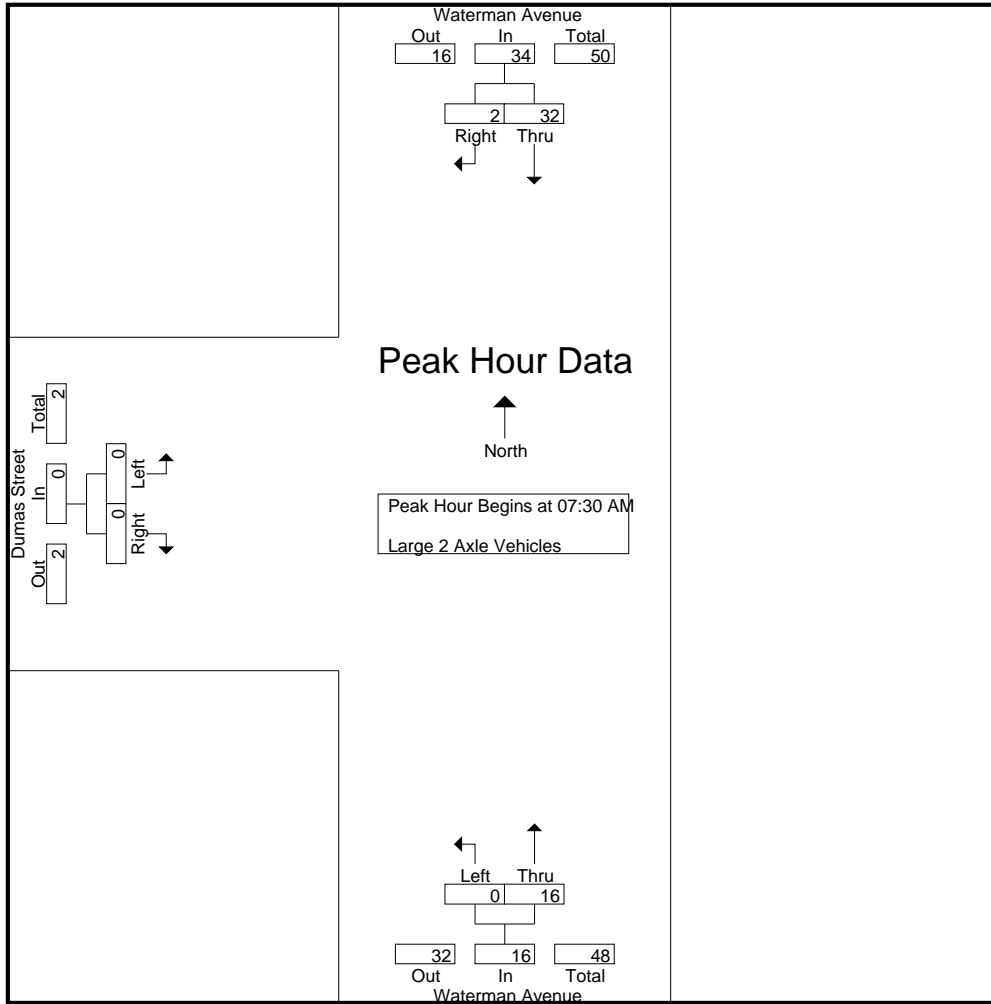
Start Time	Waterman Avenue Southbound				Waterman Avenue Northbound				Dumas Street Eastbound				Exclu. Total	Inclu. Total	Int. Total
	Thru	Right	RTOR	App. Total	Left	Thru	RTOR	App. Total	Left	Right	RTOR	App. Total			
07:00 AM	5	1	0	6	0	5	0	5	0	0	0	0	0	11	11
07:15 AM	8	1	0	9	0	5	0	5	0	0	0	0	0	14	14
07:30 AM	6	1	0	7	0	3	0	3	0	0	0	0	0	10	10
07:45 AM	6	0	0	6	0	3	0	3	0	0	0	0	0	9	9
Total	25	3	0	28	0	16	0	16	0	0	0	0	0	44	44
08:00 AM	12	1	0	13	0	5	0	5	0	0	0	0	0	18	18
08:15 AM	8	0	0	8	0	5	0	5	0	0	0	0	0	13	13
08:30 AM	7	0	0	7	0	8	0	8	0	2	0	2	0	17	17
08:45 AM	6	0	0	6	0	3	0	3	0	0	0	0	0	9	9
Total	33	1	0	34	0	21	0	21	0	2	0	2	0	57	57
Grand Total	58	4	0	62	0	37	0	37	0	2	0	2	0	101	101
Apprch %	93.5	6.5			0	100			0	100					
Total %	57.4	4		61.4	0	36.6		36.6	0	2		2	0	100	

Start Time	Waterman Avenue Southbound			Waterman Avenue Northbound			Dumas Street Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
07:30 AM	6	1	7	0	3	3	0	0	0	10
07:45 AM	6	0	6	0	3	3	0	0	0	9
08:00 AM	12	1	13	0	5	5	0	0	0	18
08:15 AM	8	0	8	0	5	5	0	0	0	13
Total Volume	32	2	34	0	16	16	0	0	0	50
% App. Total	94.1	5.9		0	100		0	0		
PHF	.667	.500	.654	.000	.800	.800	.000	.000	.000	.694

Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:30 AM

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 09-SBCWTDUAM
 Site Code : 05117141
 Start Date : 3/2/2017
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Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:30 AM			07:30 AM			07:30 AM		
+0 mins.	6	1	7	0	3	3	0	0	0
+15 mins.	6	0	6	0	3	3	0	0	0
+30 mins.	12	1	13	0	5	5	0	0	0
+45 mins.	8	0	8	0	5	5	0	0	0
Total Volume	32	2	34	0	16	16	0	0	0
% App. Total	94.1	5.9		0	100		0	0	
PHF	.667	.500	.654	.000	.800	.800	.000	.000	.000

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 09-SBCWTDUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 3 Axle Vehicles

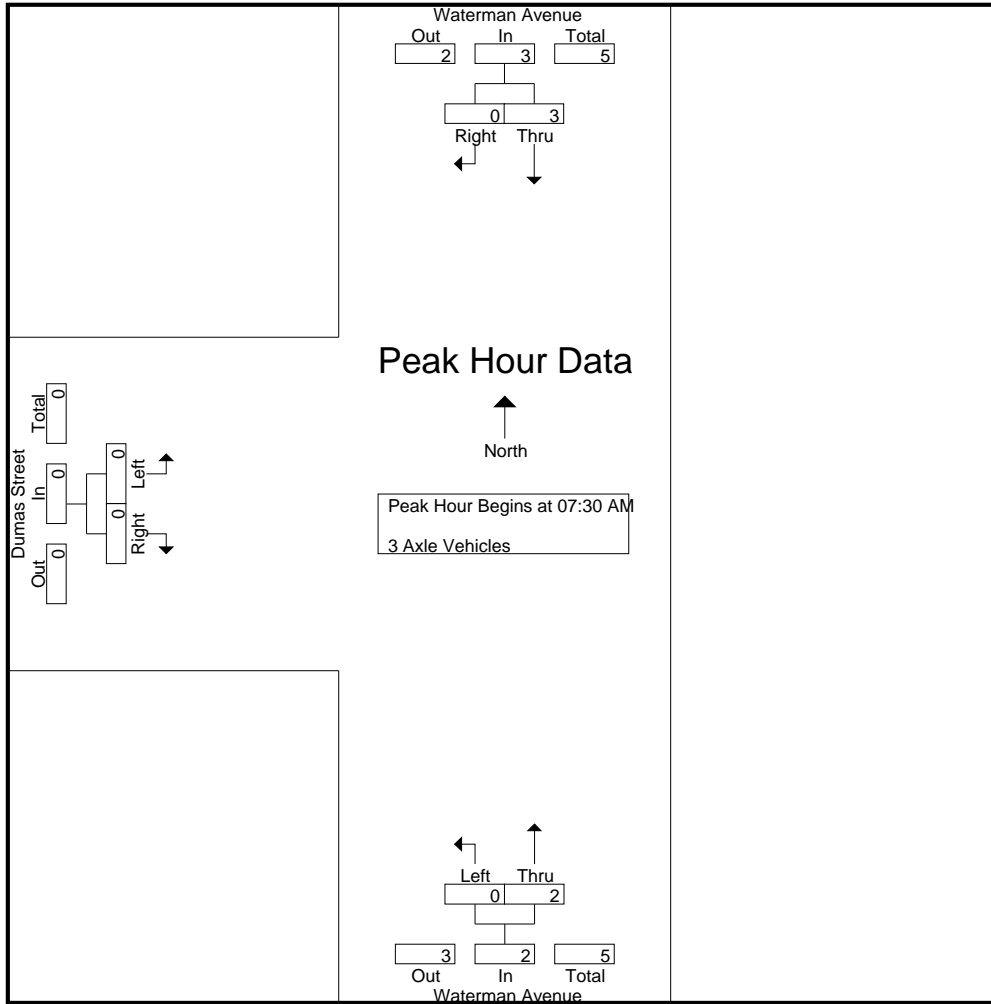
Start Time	Waterman Avenue Southbound				Waterman Avenue Northbound				Dumas Street Eastbound				Exclu. Total	Inclu. Total	Int. Total
	Thru	Right	RTOR	App. Total	Left	Thru	RTOR	App. Total	Left	Right	RTOR	App. Total			
07:00 AM	2	0	0	2	0	1	0	1	0	0	0	0	0	3	3
07:15 AM	0	0	0	0	0	2	0	2	0	0	0	0	0	2	2
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	1	0	0	1	0	0	0	0	0	0	0	0	0	1	1
Total	3	0	0	3	0	3	0	3	0	0	0	0	0	6	6
08:00 AM	2	0	0	2	0	2	0	2	0	0	0	0	0	4	4
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	1	0	0	1	0	0	0	0	0	0	0	0	0	1	1
08:45 AM	2	0	0	2	0	0	0	0	0	0	0	0	0	2	2
Total	5	0	0	5	0	2	0	2	0	0	0	0	0	7	7
Grand Total	8	0	0	8	0	5	0	5	0	0	0	0	0	13	13
Apprch %	100	0			0	100			0	0					
Total %	61.5	0		61.5	0	38.5		38.5	0	0		0		100	

Start Time	Waterman Avenue Southbound			Waterman Avenue Northbound			Dumas Street Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	1	0	1	0	0	0	0	0	0	1
08:00 AM	2	0	2	0	2	2	0	0	0	4
08:15 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	3	0	3	0	2	2	0	0	0	5
% App. Total	100	0		0	100		0	0		
PHF	.375	.000	.375	.000	.250	.250	.000	.000	.000	.313

Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:30 AM

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 09-SBCWTDUAM
 Site Code : 05117141
 Start Date : 3/2/2017
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Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:30 AM			07:30 AM			07:30 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	1	0	1	0	0	0	0	0	0
+30 mins.	2	0	2	0	2	2	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	3	0	3	0	2	2	0	0	0
% App. Total	100	0		0	100		0	0	
PHF	.375	.000	.375	.000	.250	.250	.000	.000	.000

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 09-SBCWTDUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 4+ Axle Trucks

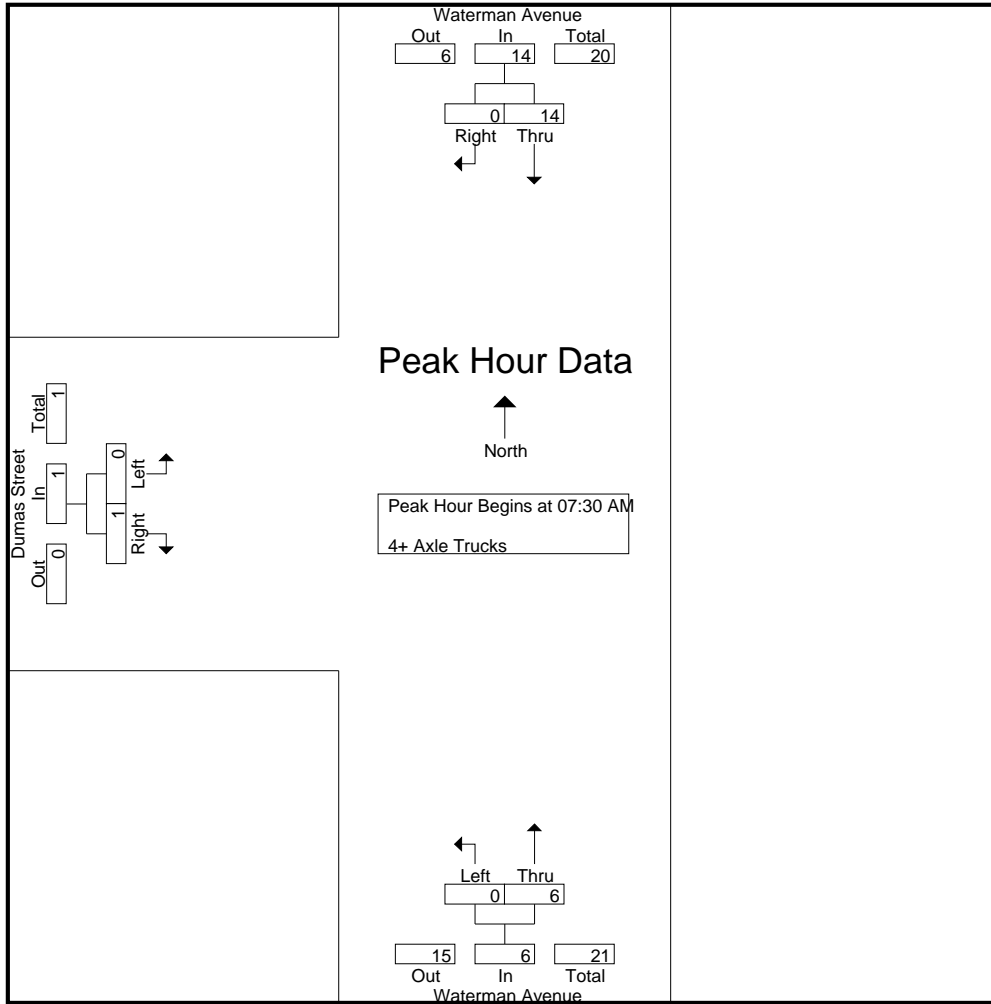
Start Time	Waterman Avenue Southbound				Waterman Avenue Northbound				Dumas Street Eastbound				Exclu. Total	Inclu. Total	Int. Total
	Thru	Right	RTOR	App. Total	Left	Thru	RTOR	App. Total	Left	Right	RTOR	App. Total			
07:00 AM	5	0	0	5	0	4	0	4	0	0	0	0	0	9	9
07:15 AM	1	0	0	1	1	0	0	1	0	0	0	0	0	2	2
07:30 AM	1	0	0	1	0	1	0	1	0	0	0	0	0	2	2
07:45 AM	3	0	0	3	0	2	0	2	0	1	0	1	0	6	6
Total	10	0	0	10	1	7	0	8	0	1	0	1	0	19	19
08:00 AM	4	0	0	4	0	2	0	2	0	0	0	0	0	6	6
08:15 AM	6	0	0	6	0	1	0	1	0	0	0	0	0	7	7
08:30 AM	2	0	0	2	0	3	0	3	0	0	0	0	0	5	5
08:45 AM	1	0	0	1	0	1	0	1	0	0	0	0	0	2	2
Total	13	0	0	13	0	7	0	7	0	0	0	0	0	20	20
Grand Total	23	0	0	23	1	14	0	15	0	1	0	1	0	39	39
Apprch %	100	0			6.7	93.3			0	100					
Total %	59	0		59	2.6	35.9		38.5	0	2.6		2.6	0	100	

Start Time	Waterman Avenue Southbound			Waterman Avenue Northbound			Dumas Street Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
07:30 AM	1	0	1	0	1	1	0	0	0	2
07:45 AM	3	0	3	0	2	2	0	1	1	6
08:00 AM	4	0	4	0	2	2	0	0	0	6
08:15 AM	6	0	6	0	1	1	0	0	0	7
Total Volume	14	0	14	0	6	6	0	1	1	21
% App. Total	100	0		0	100		0	100		
PHF	.583	.000	.583	.000	.750	.750	.000	.250	.250	.750

Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:30 AM

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 09-SBCWTDUAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:30 AM			07:30 AM			07:30 AM		
+0 mins.	1	0	1	0	1	1	0	0	0
+15 mins.	3	0	3	0	2	2	0	1	1
+30 mins.	4	0	4	0	2	2	0	0	0
+45 mins.	6	0	6	0	1	1	0	0	0
Total Volume	14	0	14	0	6	6	0	1	1
% App. Total	100	0		0	100		0	100	
PHF	.583	.000	.583	.000	.750	.750	.000	.250	.250

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 09-SBCWTDUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

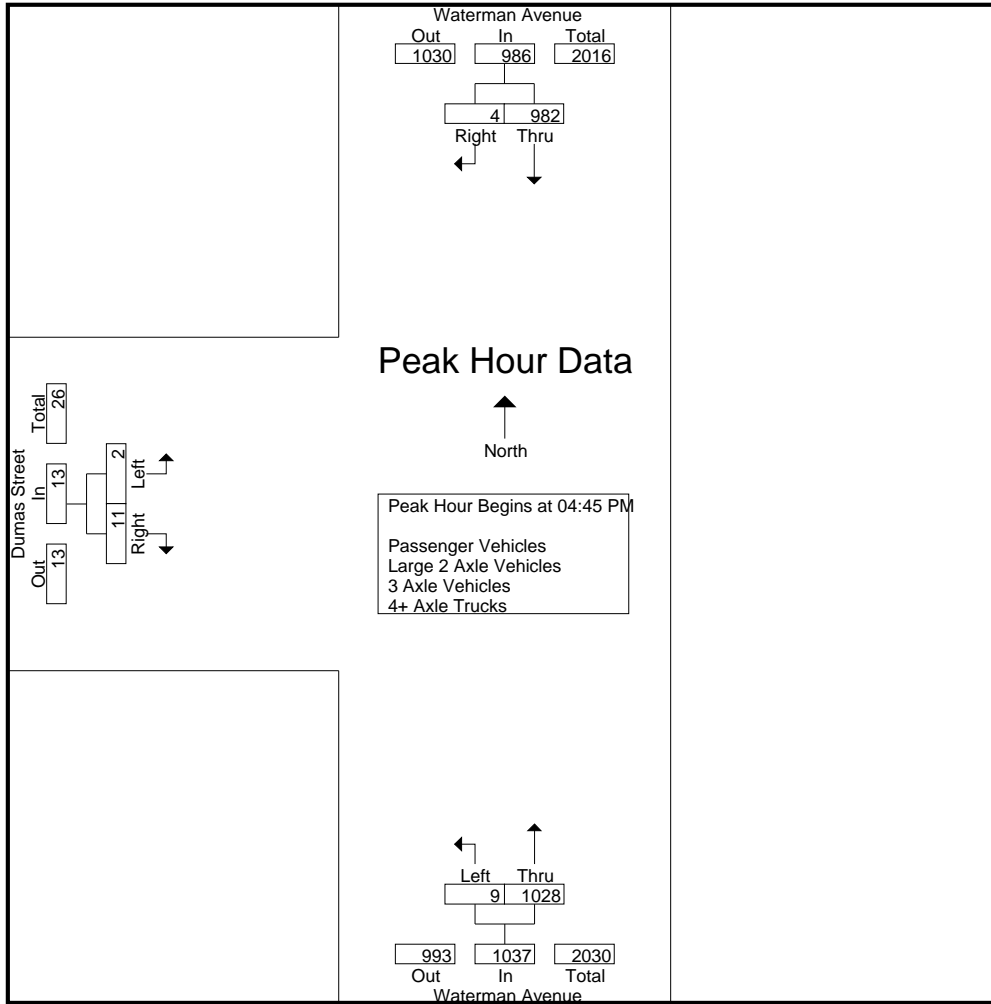
Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	Waterman Avenue Southbound				Waterman Avenue Northbound				Dumas Street Eastbound				Exclu. Total	Inclu. Total	Int. Total
	Thru	Right	RTOR	App. Total	Left	Thru	RTOR	App. Total	Left	Right	RTOR	App. Total			
04:00 PM	264	1	0	265	0	194	0	194	1	3	0	4	0	463	463
04:15 PM	247	2	0	249	3	201	0	204	0	1	0	1	0	454	454
04:30 PM	293	2	0	295	1	221	0	222	2	8	0	10	0	527	527
04:45 PM	228	1	0	229	3	207	0	210	0	3	0	3	0	442	442
Total	1032	6	0	1038	7	823	0	830	3	15	0	18	0	1886	1886
05:00 PM	248	2	0	250	2	298	0	300	1	1	0	2	0	552	552
05:15 PM	254	0	0	254	1	254	0	255	1	3	0	4	0	513	513
05:30 PM	252	1	0	253	3	269	0	272	0	4	0	4	0	529	529
05:45 PM	230	1	0	231	2	175	0	177	2	2	0	4	0	412	412
Total	984	4	0	988	8	996	0	1004	4	10	0	14	0	2006	2006
Grand Total	2016	10	0	2026	15	1819	0	1834	7	25	0	32	0	3892	3892
Apprch %	99.5	0.5			0.8	99.2			21.9	78.1					
Total %	51.8	0.3		52.1	0.4	46.7		47.1	0.2	0.6		0.8	0	100	
Passenger Vehicles	1962	9		1971	15	1784		1799	6	25		31	0	0	3801
% Passenger Vehicles	97.3	90	0	97.3	100	98.1	0	98.1	85.7	100	0	96.9	0	0	97.7
Large 2 Axle Vehicles	39	1		40	0	15		15	1	0		1	0	0	56
% Large 2 Axle Vehicles	1.9	10	0	2	0	0.8	0	0.8	14.3	0	0	3.1	0	0	1.4
3 Axle Vehicles	4	0		4	0	3		3	0	0		0	0	0	7
% 3 Axle Vehicles	0.2	0	0	0.2	0	0.2	0	0.2	0	0	0	0	0	0	0.2
4+ Axle Trucks	11	0		11	0	17		17	0	0		0	0	0	28
% 4+ Axle Trucks	0.5	0	0	0.5	0	0.9	0	0.9	0	0	0	0	0	0	0.7

Start Time	Waterman Avenue Southbound			Waterman Avenue Northbound			Dumas Street Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	228	1	229	3	207	210	0	3	3	442
05:00 PM	248	2	250	2	298	300	1	1	2	552
05:15 PM	254	0	254	1	254	255	1	3	4	513
05:30 PM	252	1	253	3	269	272	0	4	4	529
Total Volume	982	4	986	9	1028	1037	2	11	13	2036
% App. Total	99.6	0.4		0.9	99.1		15.4	84.6		
PHF	.967	.500	.970	.750	.862	.864	.500	.688	.813	.922

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 09-SBCWTDUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:00 PM			04:45 PM			04:30 PM		
+0 mins.	264	1	265	3	207	210	2	8	10
+15 mins.	247	2	249	2	298	300	0	3	3
+30 mins.	293	2	295	1	254	255	1	1	2
+45 mins.	228	1	229	3	269	272	1	3	4
Total Volume	1032	6	1038	9	1028	1037	4	15	19
% App. Total	99.4	0.6		0.9	99.1		21.1	78.9	
PHF	.881	.750	.880	.750	.862	.864	.500	.469	.475

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 09-SBCWTDUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles

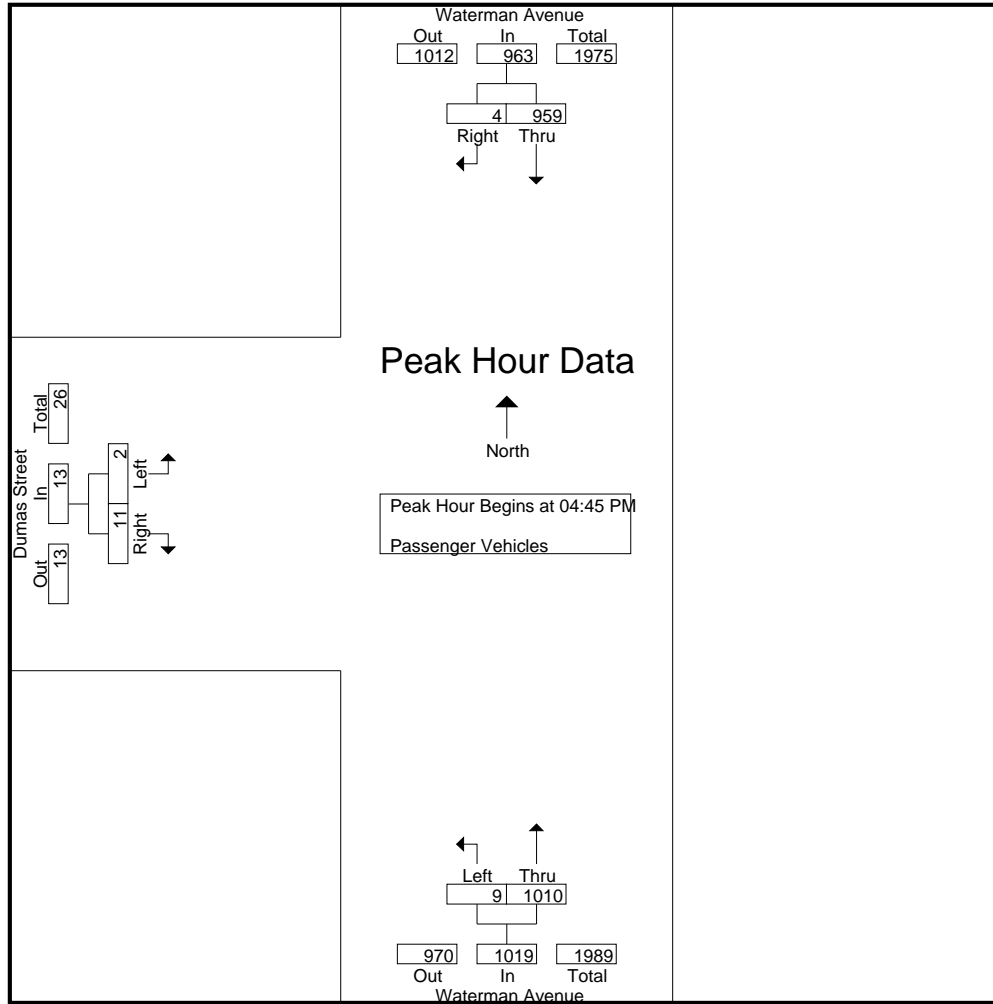
Start Time	Waterman Avenue Southbound				Waterman Avenue Northbound				Dumas Street Eastbound				Exclu. Total	Inclu. Total	Int. Total
	Thru	Right	RTOR	App. Total	Left	Thru	RTOR	App. Total	Left	Right	RTOR	App. Total			
04:00 PM	255	0	0	255	0	190	0	190	1	3	0	4	0	449	449
04:15 PM	243	2	0	245	3	194	0	197	0	1	0	1	0	443	443
04:30 PM	283	2	0	285	1	217	0	218	1	8	0	9	0	512	512
04:45 PM	220	1	0	221	3	202	0	205	0	3	0	3	0	429	429
Total	1001	5	0	1006	7	803	0	810	2	15	0	17	0	1833	1833
05:00 PM	244	2	0	246	2	293	0	295	1	1	0	2	0	543	543
05:15 PM	250	0	0	250	1	252	0	253	1	3	0	4	0	507	507
05:30 PM	245	1	0	246	3	263	0	266	0	4	0	4	0	516	516
05:45 PM	222	1	0	223	2	173	0	175	2	2	0	4	0	402	402
Total	961	4	0	965	8	981	0	989	4	10	0	14	0	1968	1968
Grand Total	1962	9	0	1971	15	1784	0	1799	6	25	0	31	0	3801	3801
Apprch %	99.5	0.5			0.8	99.2			19.4	80.6					
Total %	51.6	0.2		51.9	0.4	46.9		47.3	0.2	0.7		0.8	0	100	

Start Time	Waterman Avenue Southbound			Waterman Avenue Northbound			Dumas Street Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
04:45 PM	220	1	221	3	202	205	0	3	3	429
05:00 PM	244	2	246	2	293	295	1	1	2	543
05:15 PM	250	0	250	1	252	253	1	3	4	507
05:30 PM	245	1	246	3	263	266	0	4	4	516
Total Volume	959	4	963	9	1010	1019	2	11	13	1995
% App. Total	99.6	0.4		0.9	99.1		15.4	84.6		
PHF	.959	.500	.963	.750	.862	.864	.500	.688	.813	.919

Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:45 PM

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 09-SBCWTDUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:45 PM			04:45 PM			04:45 PM		
+0 mins.	220	1	221	3	202	205	0	3	3
+15 mins.	244	2	246	2	293	295	1	1	2
+30 mins.	250	0	250	1	252	253	1	3	4
+45 mins.	245	1	246	3	263	266	0	4	4
Total Volume	959	4	963	9	1010	1019	2	11	13
% App. Total	99.6	0.4		0.9	99.1		15.4	84.6	
PHF	.959	.500	.963	.750	.862	.864	.500	.688	.813

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 09-SBCWTDUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

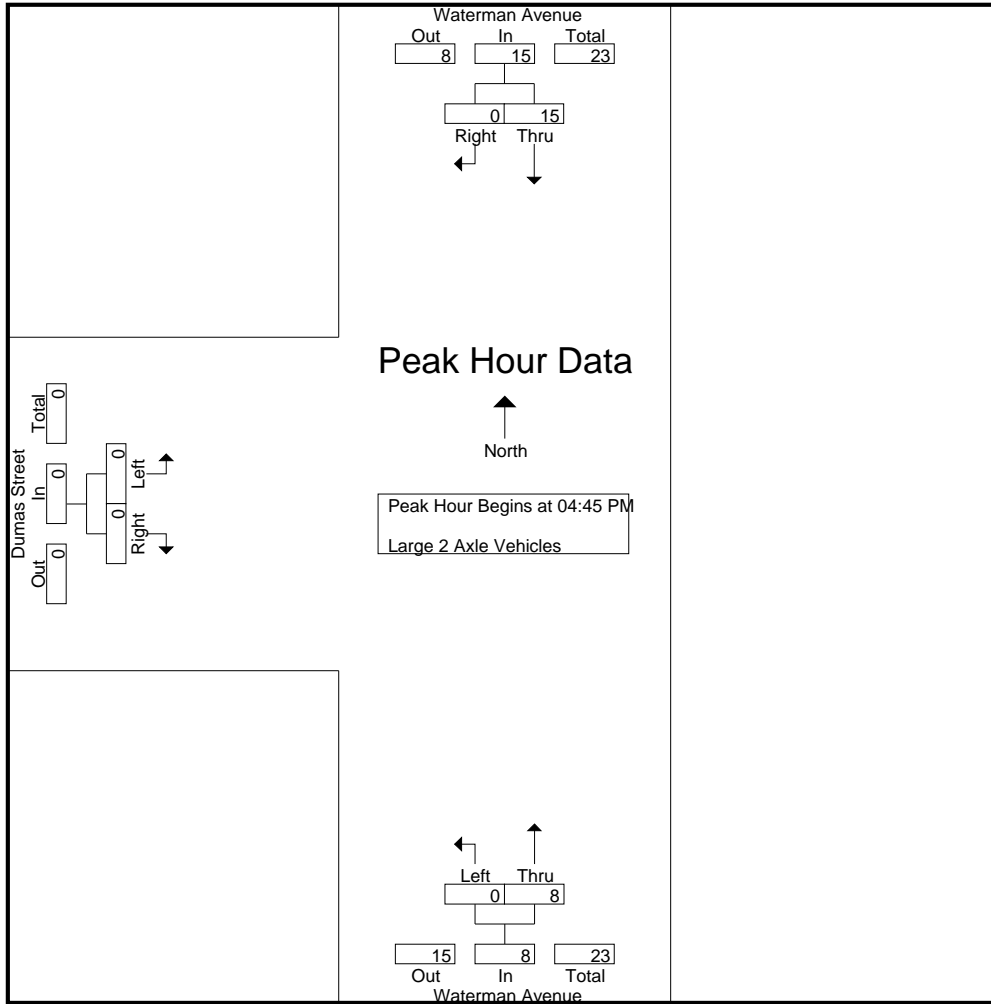
Groups Printed- Large 2 Axle Vehicles

Start Time	Waterman Avenue Southbound				Waterman Avenue Northbound				Dumas Street Eastbound				Exclu. Total	Inclu. Total	Int. Total
	Thru	Right	RTOR	App. Total	Left	Thru	RTOR	App. Total	Left	Right	RTOR	App. Total			
04:00 PM	6	1	0	7	0	2	0	2	0	0	0	0	0	9	9
04:15 PM	2	0	0	2	0	3	0	3	0	0	0	0	0	5	5
04:30 PM	9	0	0	9	0	1	0	1	1	0	0	1	0	11	11
04:45 PM	5	0	0	5	0	1	0	1	0	0	0	0	0	6	6
Total	22	1	0	23	0	7	0	7	1	0	0	1	0	31	31
05:00 PM	3	0	0	3	0	3	0	3	0	0	0	0	0	6	6
05:15 PM	3	0	0	3	0	1	0	1	0	0	0	0	0	4	4
05:30 PM	4	0	0	4	0	3	0	3	0	0	0	0	0	7	7
05:45 PM	7	0	0	7	0	1	0	1	0	0	0	0	0	8	8
Total	17	0	0	17	0	8	0	8	0	0	0	0	0	25	25
Grand Total	39	1	0	40	0	15	0	15	1	0	0	1	0	56	56
Apprch %	97.5	2.5			0	100			100	0					
Total %	69.6	1.8		71.4	0	26.8		26.8	1.8	0		1.8	0	100	

Start Time	Waterman Avenue Southbound			Waterman Avenue Northbound			Dumas Street Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
04:45 PM	5	0	5	0	1	1	0	0	0	6
05:00 PM	3	0	3	0	3	3	0	0	0	6
05:15 PM	3	0	3	0	1	1	0	0	0	4
05:30 PM	4	0	4	0	3	3	0	0	0	7
Total Volume	15	0	15	0	8	8	0	0	0	23
% App. Total	100	0		0	100		0	0		
PHF	.750	.000	.750	.000	.667	.667	.000	.000	.000	.821

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 09-SBCWTDUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:45 PM			04:45 PM			04:45 PM		
+0 mins.	5	0	5	0	1	1	0	0	0
+15 mins.	3	0	3	0	3	3	0	0	0
+30 mins.	3	0	3	0	1	1	0	0	0
+45 mins.	4	0	4	0	3	3	0	0	0
Total Volume	15	0	15	0	8	8	0	0	0
% App. Total	100	0		0	100		0	0	
PHF	.750	.000	.750	.000	.667	.667	.000	.000	.000

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 09-SBCWTDUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 3 Axle Vehicles

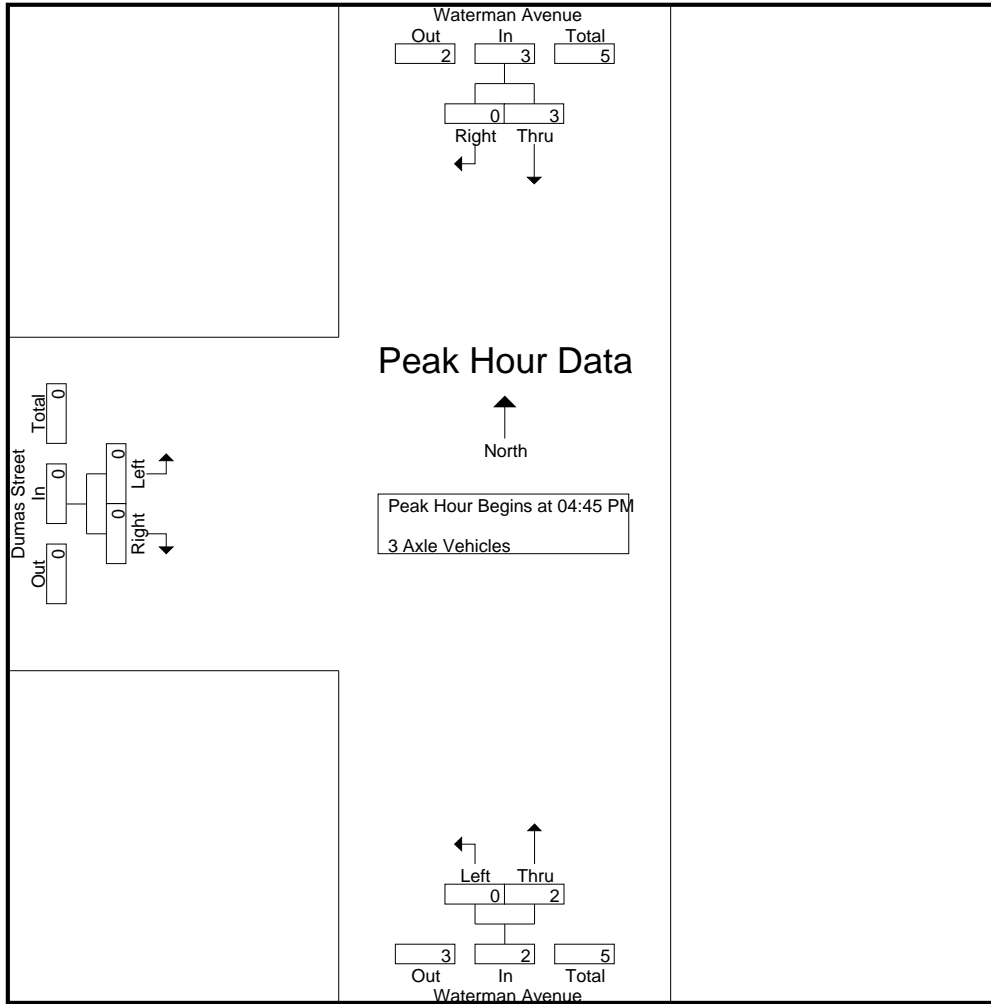
Start Time	Waterman Avenue Southbound				Waterman Avenue Northbound				Dumas Street Eastbound				Exclu. Total	Inclu. Total	Int. Total
	Thru	Right	RTOR	App. Total	Left	Thru	RTOR	App. Total	Left	Right	RTOR	App. Total			
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	2	0	0	2	0	1	0	1	0	0	0	0	0	3	3
Total	2	0	0	2	0	2	0	2	0	0	0	0	0	4	4
05:00 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	1	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	1
05:45 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	1	1
Total	2	0	0	2	0	1	0	1	0	0	0	0	0	3	3
Grand Total	4	0	0	4	0	3	0	3	0	0	0	0	0	7	7
Apprch %	100	0			0	100			0	0					
Total %	57.1	0		57.1	0	42.9		42.9	0	0		0		100	

Start Time	Waterman Avenue Southbound			Waterman Avenue Northbound			Dumas Street Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
04:45 PM	2	0	2	0	1	1	0	0	0	3
05:00 PM	1	0	1	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	1	1	0	0	0	1
Total Volume	3	0	3	0	2	2	0	0	0	5
% App. Total	100	0		0	100		0	0		
PHF	.375	.000	.375	.000	.500	.500	.000	.000	.000	.417

Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:45 PM

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 09-SBCWTDUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:45 PM			04:45 PM			04:45 PM		
+0 mins.	2	0	2	0	1	1	0	0	0
+15 mins.	1	0	1	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	1	1	0	0	0
Total Volume	3	0	3	0	2	2	0	0	0
% App. Total	100	0		0	100		0	0	
PHF	.375	.000	.375	.000	.500	.500	.000	.000	.000

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 09-SBCWTDUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 4+ Axle Trucks

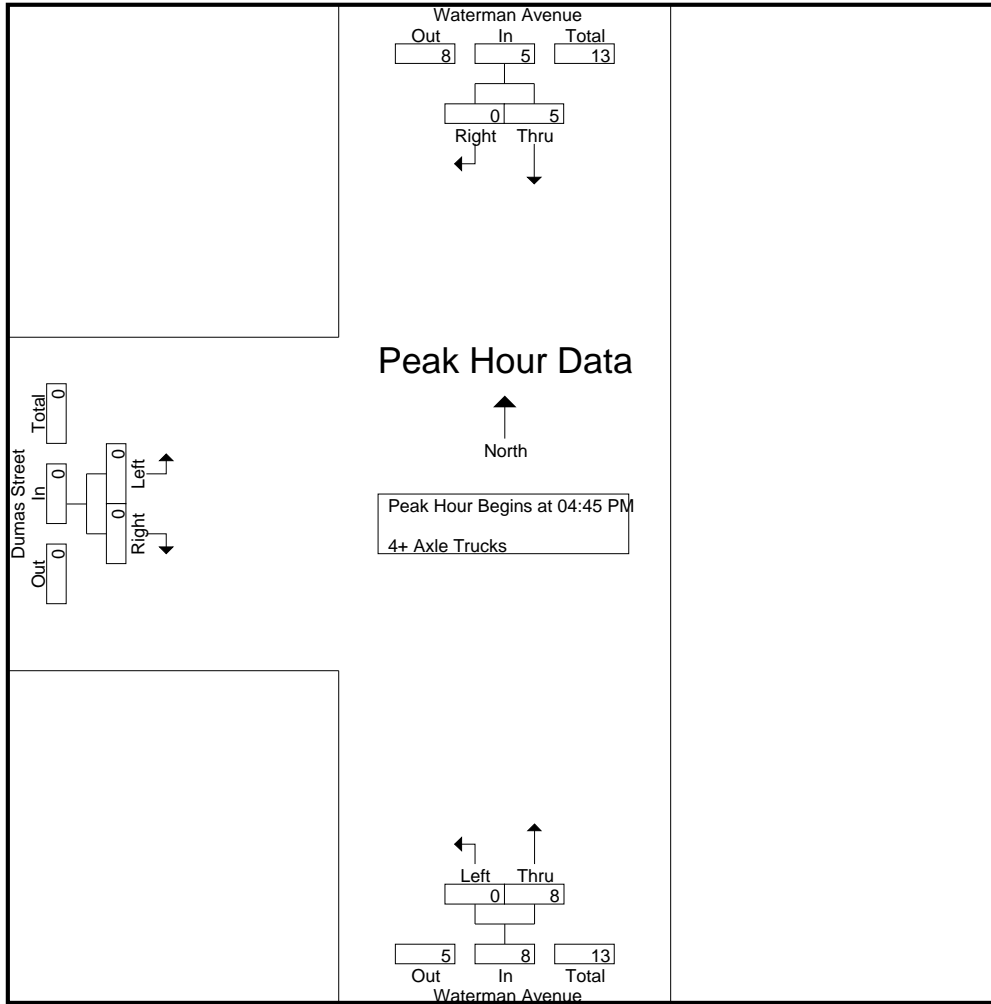
Start Time	Waterman Avenue Southbound				Waterman Avenue Northbound				Dumas Street Eastbound				Exclu. Total	Inclu. Total	Int. Total
	Thru	Right	RTOR	App. Total	Left	Thru	RTOR	App. Total	Left	Right	RTOR	App. Total			
04:00 PM	3	0	0	3	0	2	0	2	0	0	0	0	0	5	5
04:15 PM	2	0	0	2	0	3	0	3	0	0	0	0	0	5	5
04:30 PM	1	0	0	1	0	3	0	3	0	0	0	0	0	4	4
04:45 PM	1	0	0	1	0	3	0	3	0	0	0	0	0	4	4
Total	7	0	0	7	0	11	0	11	0	0	0	0	0	18	18
05:00 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	2	2
05:15 PM	1	0	0	1	0	1	0	1	0	0	0	0	0	2	2
05:30 PM	3	0	0	3	0	2	0	2	0	0	0	0	0	5	5
05:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	1	1
Total	4	0	0	4	0	6	0	6	0	0	0	0	0	10	10
Grand Total	11	0	0	11	0	17	0	17	0	0	0	0	0	28	28
Apprch %	100	0			0	100			0	0					
Total %	39.3	0		39.3	0	60.7		60.7	0	0		0		100	

Start Time	Waterman Avenue Southbound			Waterman Avenue Northbound			Dumas Street Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
04:45 PM	1	0	1	0	3	3	0	0	0	4
05:00 PM	0	0	0	0	2	2	0	0	0	2
05:15 PM	1	0	1	0	1	1	0	0	0	2
05:30 PM	3	0	3	0	2	2	0	0	0	5
Total Volume	5	0	5	0	8	8	0	0	0	13
% App. Total	100	0		0	100		0	0		
PHF	.417	.000	.417	.000	.667	.667	.000	.000	.000	.650

Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:45 PM

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Dumas Street
 Weather: Clear

File Name : 09-SBCWTDUPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:45 PM			04:45 PM			04:45 PM		
+0 mins.	1	0	1	0	3	3	0	0	0
+15 mins.	0	0	0	0	2	2	0	0	0
+30 mins.	1	0	1	0	1	1	0	0	0
+45 mins.	3	0	3	0	2	2	0	0	0
Total Volume	5	0	5	0	8	8	0	0	0
% App. Total	100	0		0	100		0	0	
PHF	.417	.000	.417	.000	.667	.667	.000	.000	.000

Location: San Bernardino
 N/S: Waterman Avenue
 E/W: Dumas Street



Date: 3/2/2017
 Day: Thursday

PEDESTRIANS

	North Leg Waterman Avenue	East Leg Dumas Street	South Leg Waterman Avenue	West Leg Dumas Street	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	1	1	2
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	0	0	1	1	2

	North Leg Waterman Avenue	East Leg Dumas Street	South Leg Waterman Avenue	West Leg Dumas Street	TOTAL
4:00 PM	0	0	0	1	1
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	1	0	0	1
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	1	0	1	2

Location: San Bernardino
 N/S: Waterman Avenue
 E/W: Dumas Street



Date: 3/2/2017
 Day: Thursday

BICYCLES

	North Leg Waterman Avenue	East Leg Dumas Street	South Leg Waterman Avenue	West Leg Dumas Street	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

	North Leg Waterman Avenue	East Leg Dumas Street	South Leg Waterman Avenue	West Leg Dumas Street	TOTAL
4:00 PM	0	0	0	2	2
4:15 PM	0	0	0	1	1
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	1	0	0	1
5:15 PM	0	1	0	0	1
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	2	0	3	5

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle (South)
 Weather: Clear

File Name : 10-SBCWTPAAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	Waterman Avenue Southbound						Parkcenter Circle Westbound						Waterman Avenue Northbound						Public Golf Course Driveway Eastbound						
	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Int. Total
07:00 AM	1	117	0	0	118	0	5	0	0	0	5	0	141	5	0	150	0	0	0	0	0	0	0	0	273
07:15 AM	3	129	1	0	133	0	7	0	3	2	10	1	127	12	1	140	0	0	0	0	0	0	0	0	283
07:30 AM	4	190	0	0	194	0	2	0	2	0	4	3	127	12	0	142	0	0	0	0	0	0	0	0	340
07:45 AM	16	238	1	0	255	0	3	0	1	0	4	6	168	32	0	206	0	0	0	0	0	0	0	0	465
Total	24	674	2	0	700	0	17	0	6	2	23	14	563	61	1	638	0	0	0	0	0	0	0	0	1361
08:00 AM	11	143	2	0	156	0	5	1	1	1	7	7	158	40	2	205	0	0	0	0	0	0	0	0	371
08:15 AM	12	157	2	0	171	0	6	0	3	1	9	4	123	28	1	155	0	0	0	0	0	0	0	0	335
08:30 AM	9	142	0	0	151	0	4	0	3	2	7	9	111	15	1	135	0	0	0	0	0	0	0	0	293
08:45 AM	1	134	3	0	138	0	2	0	1	1	3	14	110	15	0	139	0	0	4	4	4	4	4	4	284
Total	33	576	7	0	616	0	17	1	8	5	26	34	502	98	4	634	0	0	4	4	4	4	4	4	1280
Grand Total	57	1250	9	0	1316	0	34	1	14	7	49	48	1065	159	5	1272	0	0	4	4	4	4	4	4	2657
Approach %	4.3	95	0.7		69.4		2	28.6				3.8	83.7	12.5				100							
Total %	2.2	47.3	0.3		49.8		1.3	0	0.5		1.9	1.8	40.3	6		48.2		0	0.2					0.6	99.4
Passenger Vehicles	56	1173	9		1238		28	1	13		49	46	1009	147		1207		0	4					8	0
% Passenger Vehicles	98.2	93.8	100		94.1		82.4	100	92.9	100	87.5	95.8	94.7	92.5	100	94.5		0	100	100				100	0
Large 2 Axle Vehicles	1	45	0		46		5	0	1		6	1	21	8		30		0	0					0	0
% Large 2 Axle Vehicles	1.8	3.6	0		3.5		14.7	0	7.1	0	10.7	2.1	2	5	0	2.3		0	0	0				0	0
3 Axle Vehicles	0	9	0		9		0	0	0		0	0	3	0		3		0	0					0	0
% 3 Axle Vehicles	0	0.7	0		0.7		0	0	0		0	0	0.3	0		0.2		0	0	0				0	0
4+ Axle Trucks	0	23	0		23		1	0	0		1	1	32	4		37		0	0					0	0
% 4+ Axle Trucks	0	1.8	0		1.7		2.9	0	0		1.8	2.1	3	2.5		2.9		0	0	0				0	0

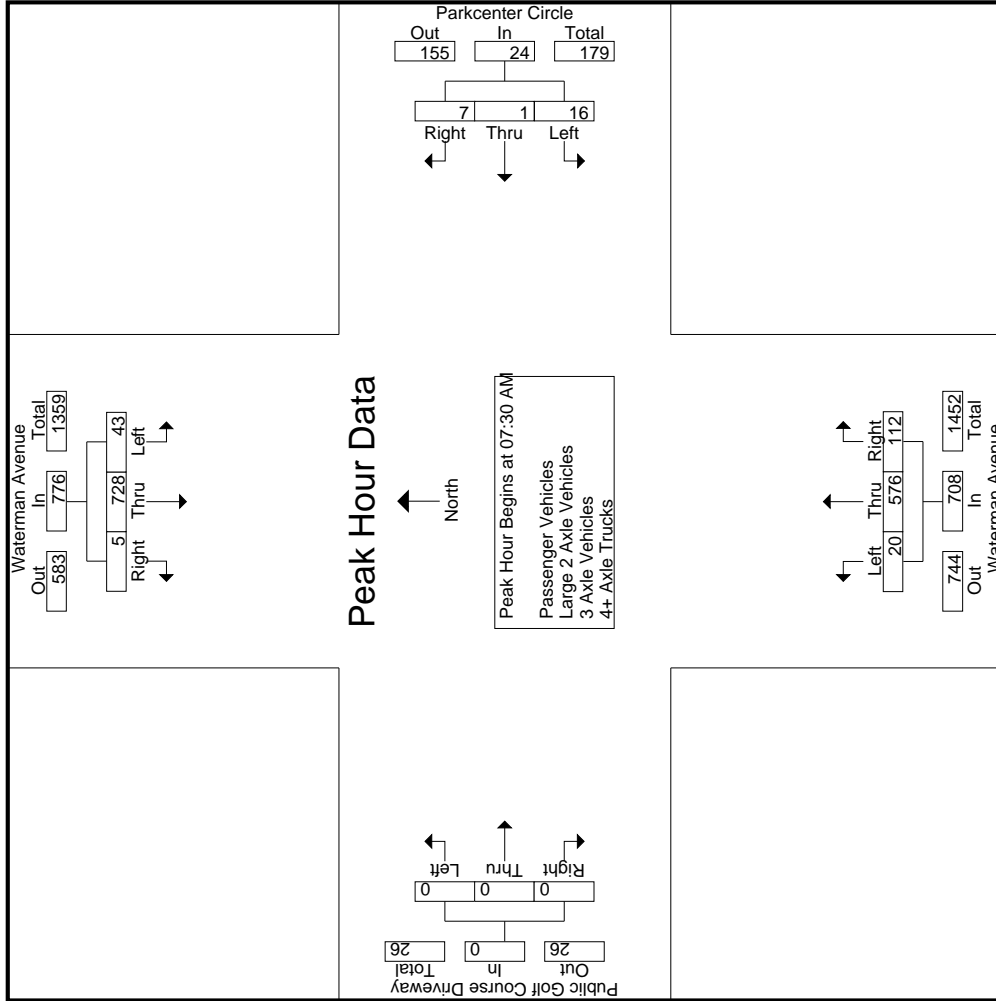
Start Time	Waterman Avenue Southbound						Parkcenter Circle Westbound						Waterman Avenue Northbound						Public Golf Course Driveway Eastbound						
	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Int. Total
07:30 AM	4	190	0		194		2	0	0		2	3	127	12		12		0	0					0	340
07:45 AM	16	238	1		255		3	0	1		4	6	168	32		32		0	0					0	465
08:00 AM	11	143	2		156		5	1	1		7	7	158	40		40		0	0					0	368
08:15 AM	12	157	2		171		6	0	3		9	4	123	28		28		0	0					0	335
Total Volume	43	728	5		776		16	1	7		24	20	576	112		112		0	0					0	1508
% App. Total	5.5	93.8	0.6		94.1		66.7	4.2	29.2		29.2	2.8	81.4	15.8		15.8		0	0					0	0
PHF	.672	.765	.625		.761		.667	.250	.583		.667	.714	.857	.700		.700		.000	.000					.000	.811

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:30 AM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle (South)
 Weather: Clear

File Name : 10-SBCWTPAAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle (South)
 Weather: Clear

File Name : 10-SBCWTPAAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Waterman Avenue Southbound			Parkcenter Circle Westbound			Waterman Avenue Northbound			Public Golf Course Driveway Eastbound				
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	07:30 AM			07:45 AM			07:30 AM			08:00 AM				
+0 mins.	4	190	0	3	0	1	4	3	127	12	142	0	0	0
+15 mins.	16	238	1	5	1	1	7	6	168	32	206	0	0	0
+30 mins.	11	143	2	6	0	3	9	7	158	40	205	0	0	0
+45 mins.	12	157	2	4	0	3	7	4	123	28	155	0	0	4
Total Volume	43	728	5	18	1	8	27	20	576	112	708	0	0	4
% App. Total	5.5	93.8	0.6	66.7	3.7	29.6	2.8	81.4	15.8	15.8	0	0	0	100
PHF	.672	.765	.625	.750	.250	.667	.750	.714	.857	.700	.859	.000	.000	.250

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle (South)
 Weather: Clear

File Name : 10-SBCWTPAAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles

Start Time	Waterman Avenue Southbound					Parkcenter Circle Westbound					Waterman Avenue Northbound					Public Golf Course Driveway Eastbound								
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
07:00 AM	1	105	0	0	106	3	0	0	0	3	3	136	4	0	143	0	0	0	0	0	0	0	252	252
07:15 AM	3	124	1	0	128	6	0	2	2	8	1	120	11	1	132	0	0	0	0	0	3	268	271	
07:30 AM	4	174	0	0	178	1	0	2	0	3	3	117	12	0	132	0	0	0	0	0	0	313	313	
07:45 AM	16	231	1	0	248	3	0	1	0	4	6	164	31	0	201	0	0	0	0	0	0	453	453	
Total	24	634	2	0	660	13	0	5	2	18	13	537	58	1	608	0	0	0	0	0	3	1286	1289	
08:00 AM	11	134	2	0	147	5	1	1	1	7	7	148	38	2	193	0	0	0	0	0	3	347	350	
08:15 AM	11	151	2	0	164	5	0	3	1	8	4	113	27	1	144	0	0	0	0	0	2	316	318	
08:30 AM	9	130	0	0	139	3	0	3	2	6	9	106	13	1	128	0	0	0	0	0	3	273	276	
08:45 AM	1	124	3	0	128	2	0	1	1	3	13	105	11	0	129	0	0	4	4	4	5	264	269	
Total	32	539	7	0	578	15	1	8	5	24	33	472	89	4	594	0	0	4	4	4	13	1200	1213	
Grand Total	56	1173	9	0	1238	28	1	13	7	42	46	1009	147	5	1202	0	0	4	4	4	16	2486	2502	
Approach %	4.5	94.7	0.7		66.7	2.4	31			1.7	3.8	83.9	12.2		48.4	0	0	100	0.2	0.2	0.6	99.4		
Total %	2.3	47.2	0.4		49.8	1.1	0	0.5		1.7	1.9	40.6	5.9			0	0	0.2						

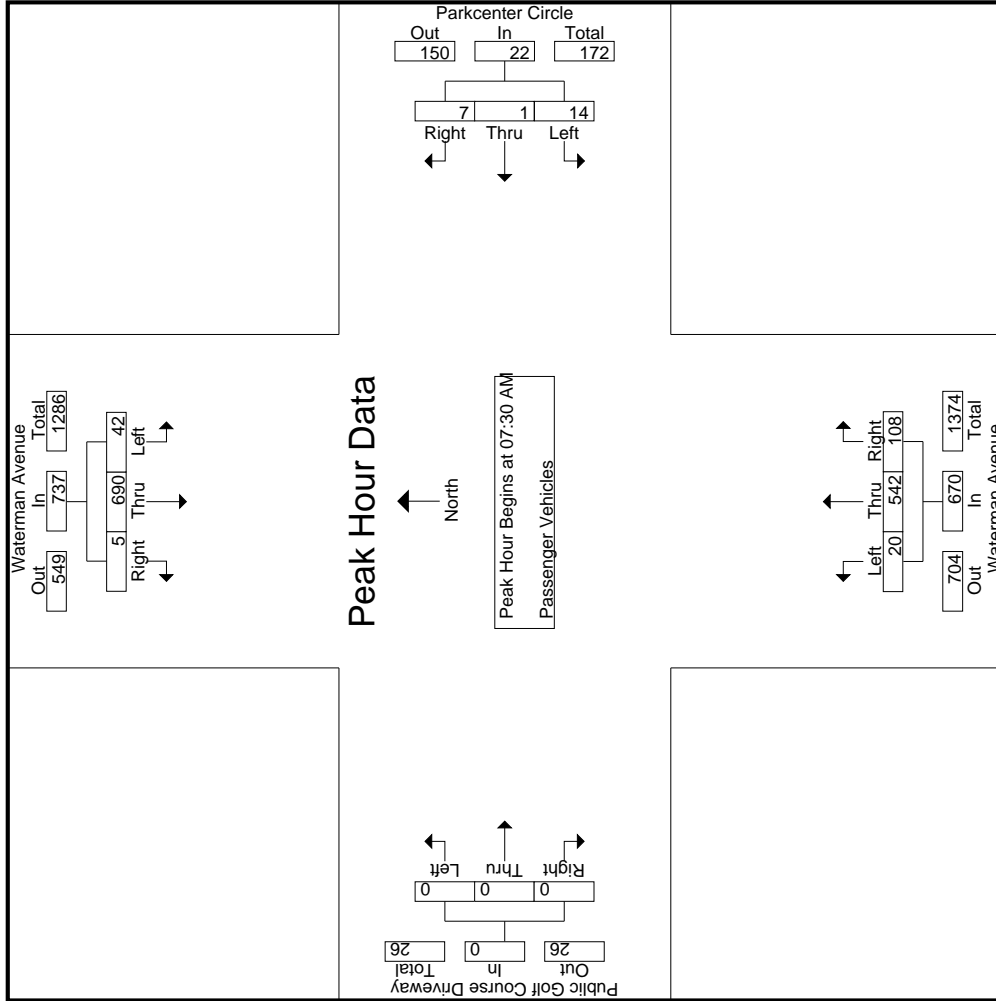
Start Time	Waterman Avenue Southbound					Parkcenter Circle Westbound					Waterman Avenue Northbound					Public Golf Course Driveway Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:30 AM	4	174	0		178	1	0	0	2	3	3	117	12		132	0	0	0		0	0	0	313
07:45 AM	16	231	1		248	3	0	1	1	4	6	164	31		201	0	0	0		0	0	0	453
08:00 AM	11	134	2		147	5	0	3	2	6	7	148	38		193	0	0	0		0	0	0	347
08:15 AM	11	151	2		164	5	0	3	2	8	4	113	27		144	0	0	0		0	0	0	316
Total Volume	42	690	5		737	14	1	7	7	22	20	542	108		670	0	0	0		0	0	0	1429
% App. Total	5.7	93.6	0.7		66.7	2.4	31			1.7	3.8	80.9	16.1		48.4	0	0	100	0.2	0.2	0.6	99.4	
PHF	.656	.747	.625		.743	.700	.250	.583		.688	.714	.826	.711		.833	.000	.000	.000		.000	.000	.000	.789

Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:30 AM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle (South)
 Weather: Clear

File Name : 10-SBCWTPAAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle (South)
 Weather: Clear

File Name : 10-SBCWTPAAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Waterman Avenue Southbound				Parkcenter Circle Westbound				Waterman Avenue Northbound				Public Golf Course Driveway Eastbound			
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																
Peak Hour for Each Approach Begins at:																
	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	4	174	0	178	1	0	2	3	3	117	12	132	0	0	0	0
+15 mins.	16	231	1	248	3	0	1	4	6	164	31	201	0	0	0	0
+30 mins.	11	134	2	147	5	1	1	7	7	148	38	193	0	0	0	0
+45 mins.	11	151	2	164	5	0	3	8	4	113	27	144	0	0	0	0
Total Volume	42	690	5	737	14	1	7	22	20	542	108	670	0	0	0	0
% App. Total	5.7	93.6	0.7		63.6	4.5	31.8		3	80.9	16.1		0	0	0	
PHF	.656	.747	.625	.743	.700	.250	.583	.688	.714	.826	.711	.833	.000	.000	.000	.000

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle (South)
 Weather: Clear

File Name : 10-SBCWTPAAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Large 2 Axle Vehicles

Start Time	Waterman Avenue Southbound					Parkcenter Circle Westbound					Waterman Avenue Northbound					Public Golf Course Driveway Eastbound								
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
07:00 AM	0	6	0	0	6	2	0	0	0	2	0	2	1	0	3	0	0	0	0	0	0	0	11	11
07:15 AM	0	4	0	0	4	1	0	1	0	2	0	2	0	0	2	0	0	0	0	0	0	0	8	8
07:30 AM	0	11	0	0	11	1	0	0	0	1	0	4	0	0	4	0	0	0	0	0	0	16	16	
07:45 AM	0	5	0	0	5	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	7	7	
Total	0	26	0	0	26	4	0	1	0	5	0	10	1	0	11	0	0	0	0	0	0	42	42	
08:00 AM	0	4	0	0	4	0	0	0	0	0	0	2	1	0	3	0	0	0	0	0	0	7	7	
08:15 AM	1	4	0	0	5	0	0	0	0	0	0	3	1	0	4	0	0	0	0	0	0	9	9	
08:30 AM	0	5	0	0	5	1	0	0	0	1	0	3	2	0	5	0	0	0	0	0	0	11	11	
08:45 AM	0	6	0	0	6	0	0	0	0	0	1	3	3	0	7	0	0	0	0	0	0	13	13	
Total	1	19	0	0	20	1	0	0	0	1	1	11	7	0	19	0	0	0	0	0	0	40	40	
Grand Total	1	45	0	0	46	5	0	1	0	6	1	21	8	0	30	0	0	0	0	0	0	82	82	
Approach %	2.2	97.8	0	0	83.3	0	16.7	0	1.2	7.3	3.3	70	26.7	0	36.6	0	0	0	0	0	0	100	100	
Total %	1.2	54.9	0	0	56.1	6.1	0	1.2	0	0	1.2	25.6	9.8	0	0	0	0	0	0	0	0	0	0	

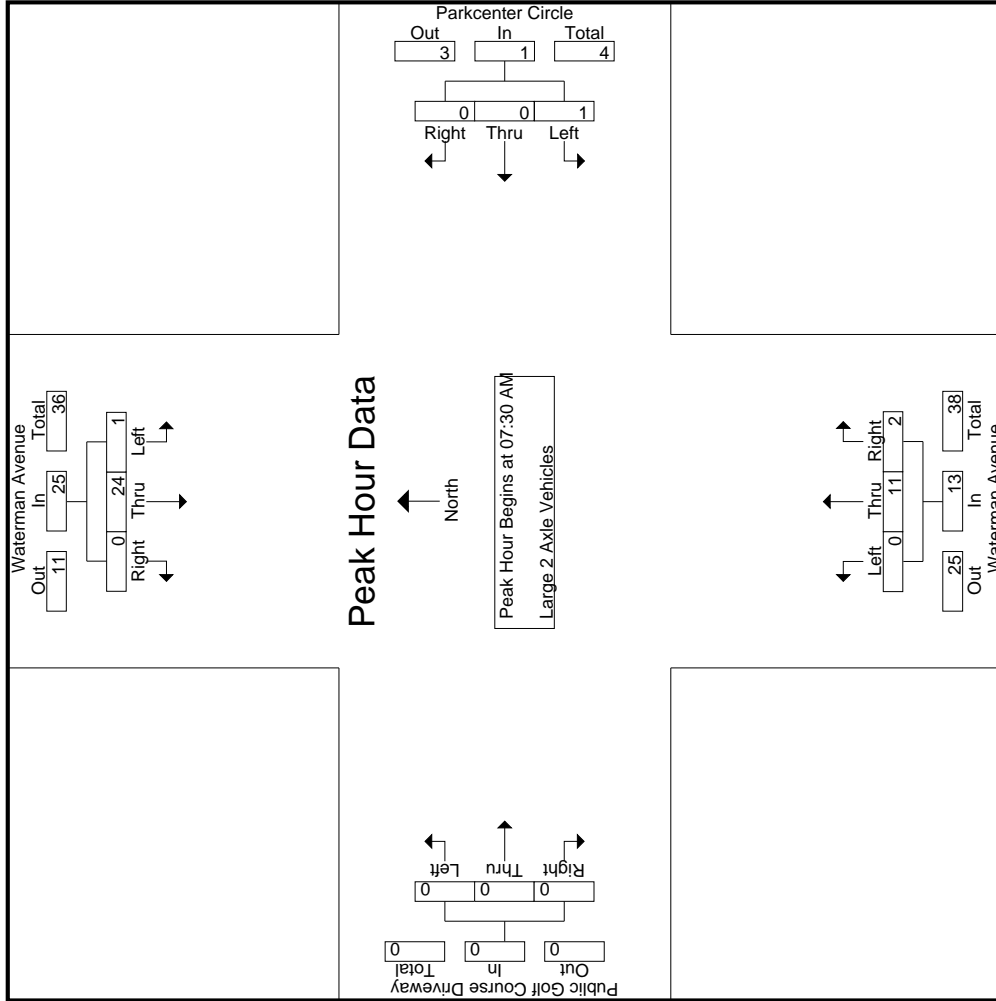
Start Time	Waterman Avenue Southbound					Parkcenter Circle Westbound					Waterman Avenue Northbound					Public Golf Course Driveway Eastbound								
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
07:30 AM	0	11	0	0	11	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	16
07:45 AM	0	5	0	0	5	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	7
08:00 AM	0	4	0	0	4	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	7
08:15 AM	1	4	0	0	5	0	0	0	0	0	0	3	1	0	4	0	0	0	0	0	0	0	0	9
Total Volume	1	24	0	0	25	1	0	0	0	1	0	11	2	0	13	0	0	0	0	0	0	0	0	39
% App. Total	4	96	0	0	100	0	0	0	0	0	0	84.6	15.4	0	0	0	0	0	0	0	0	0	0	0
PHF	.250	.545	.000	.000	.568	.250	.000	.000	.000	.250	.000	.688	.500	.000	.813	.000	.000	.000	.000	.000	.000	.000	.000	.609

Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:30 AM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle (South)
 Weather: Clear

File Name : 10-SBCWTPAAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle (South)
 Weather: Clear

File Name : 10-SBCWTPAAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Waterman Avenue Southbound			Parkcenter Circle Westbound			Waterman Avenue Northbound			Public Golf Course Driveway Eastbound				
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
+0 mins.	0	11	0	1	0	0	0	0	0	0	0	0	4	0
+15 mins.	0	5	0	0	0	0	0	0	0	2	0	0	2	0
+30 mins.	0	4	0	0	0	0	0	0	0	2	1	1	3	0
+45 mins.	1	4	0	0	0	0	0	0	0	3	1	1	4	0
Total Volume	1	24	0	1	0	0	0	0	0	11	2	2	13	0
% App. Total	4	96	0	100	0	0	0	0	0	84.6	15.4	0	0	0
PHF	.250	.545	.000	.250	.000	.000	.000	.000	.000	.688	.500	.000	.813	.000

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle (South)
 Weather: Clear

File Name : 10-SBCWTPAAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 3 Axle Vehicles

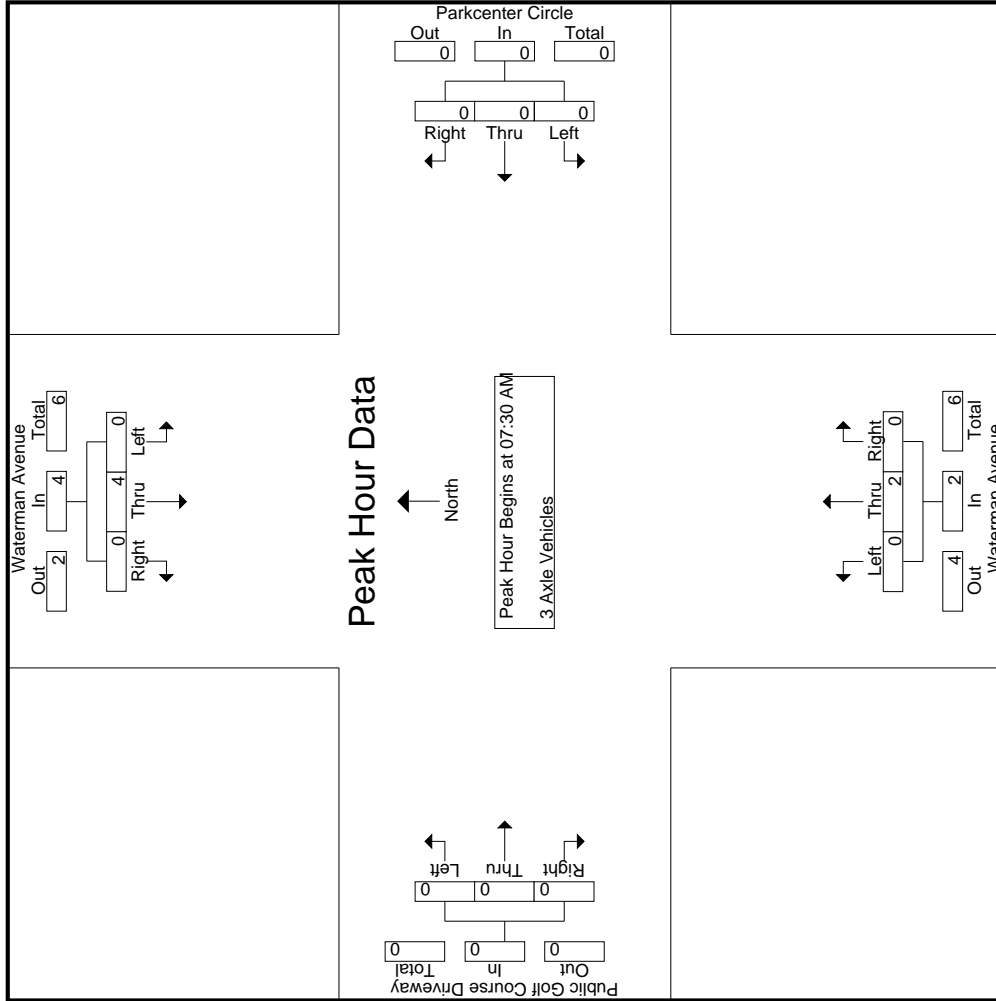
Start Time	Waterman Avenue Southbound				Parkcenter Circle Westbound				Waterman Avenue Northbound				Public Golf Course Driveway Eastbound					
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	2
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	2
07:45 AM	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	2	2
Total	0	5	0	0	5	0	0	0	0	1	0	0	0	0	1	0	6	6
08:00 AM	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	2	2
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	2
08:45 AM	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	2	2
Total	0	4	0	0	4	0	0	0	0	2	0	0	0	0	2	0	6	6
Grand Total	0	9	0	0	9	0	0	0	0	3	0	0	0	0	3	0	12	12
Approach %	0	100	0	0	75	0	0	0	0	100	0	0	0	0	25	0	100	100
Total %	0	75	0	0	75	0	0	0	0	0	25	0	0	0	0	0	100	100

Start Time	Waterman Avenue Southbound				Parkcenter Circle Westbound				Waterman Avenue Northbound				Public Golf Course Driveway Eastbound					
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:30 AM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	1	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0
08:00 AM	0	1	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	4	0	0	4	0	0	0	0	2	0	0	0	0	2	0	0	0
% App. Total	0	100	0	0	100	0	0	0	0	100	0	0	0	0	100	0	0	0
PHF	.000	.500	.000	.000	.500	.000	.000	.000	.000	.500	.000	.000	.000	.000	.500	.000	.000	.750

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle (South)
 Weather: Clear

File Name : 10-SBCWTPAAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle (South)
 Weather: Clear

File Name : 10-SBCWTPAAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Waterman Avenue Southbound			Parkcenter Circle Westbound			Waterman Avenue Northbound			Public Golf Course Driveway Eastbound				
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	07:30 AM			07:30 AM			07:30 AM			07:30 AM				
+0 mins.	0	2	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	1	0	0	0	0	0	1	0	0	0	0	1	0
+30 mins.	0	1	0	0	0	0	0	0	1	0	0	0	1	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	4	0	0	0	0	0	2	0	0	0	0	2	0
% App. Total	0	100	0	0	0	0	0	100	0	0	0	0	0	0
PHF	.000	.500	.000	.000	.000	.000	.000	.500	.000	.000	.000	.000	.500	.000

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle (South)
 Weather: Clear

File Name : 10-SBCWTPAAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 4+ Axle Trucks

Start Time	Waterman Avenue Southbound					Parkcenter Circle Westbound					Waterman Avenue Northbound					Public Golf Course Driveway Eastbound								
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
07:00 AM	0	4	0	0	4	0	0	0	0	0	1	3	0	0	4	0	0	0	0	0	0	0	8	8
07:15 AM	0	1	0	0	1	0	0	0	0	0	0	5	1	0	6	0	0	0	0	0	0	0	7	7
07:30 AM	0	3	0	0	3	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	0	9	9
07:45 AM	0	1	0	0	1	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	0	0	3	3
Total	0	9	0	0	9	0	0	0	0	0	1	15	2	0	18	0	0	0	0	0	0	0	27	27
08:00 AM	0	4	0	0	4	0	0	0	0	0	0	7	1	0	8	0	0	0	0	0	0	0	12	12
08:15 AM	0	2	0	0	2	1	0	0	0	1	0	7	0	0	7	0	0	0	0	0	0	0	10	10
08:30 AM	0	5	0	0	5	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	7	7
08:45 AM	0	3	0	0	3	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	0	0	5	5
Total	0	14	0	0	14	1	0	0	0	1	0	17	2	0	19	0	0	0	0	0	0	0	34	34
Grand Total	0	23	0	0	23	1	0	0	0	1	1	32	4	0	37	0	0	0	0	0	0	0	61	61
Approach %	0	100	0	0		100	0	0	0		2.7	86.5	10.8		60.7	0	0	0	0	0	0	0	100	
Total %	0	37.7	0	0	37.7	1.6	0	0	0	1.6	1.6	52.5	6.6			0	0	0	0	0	0	0		

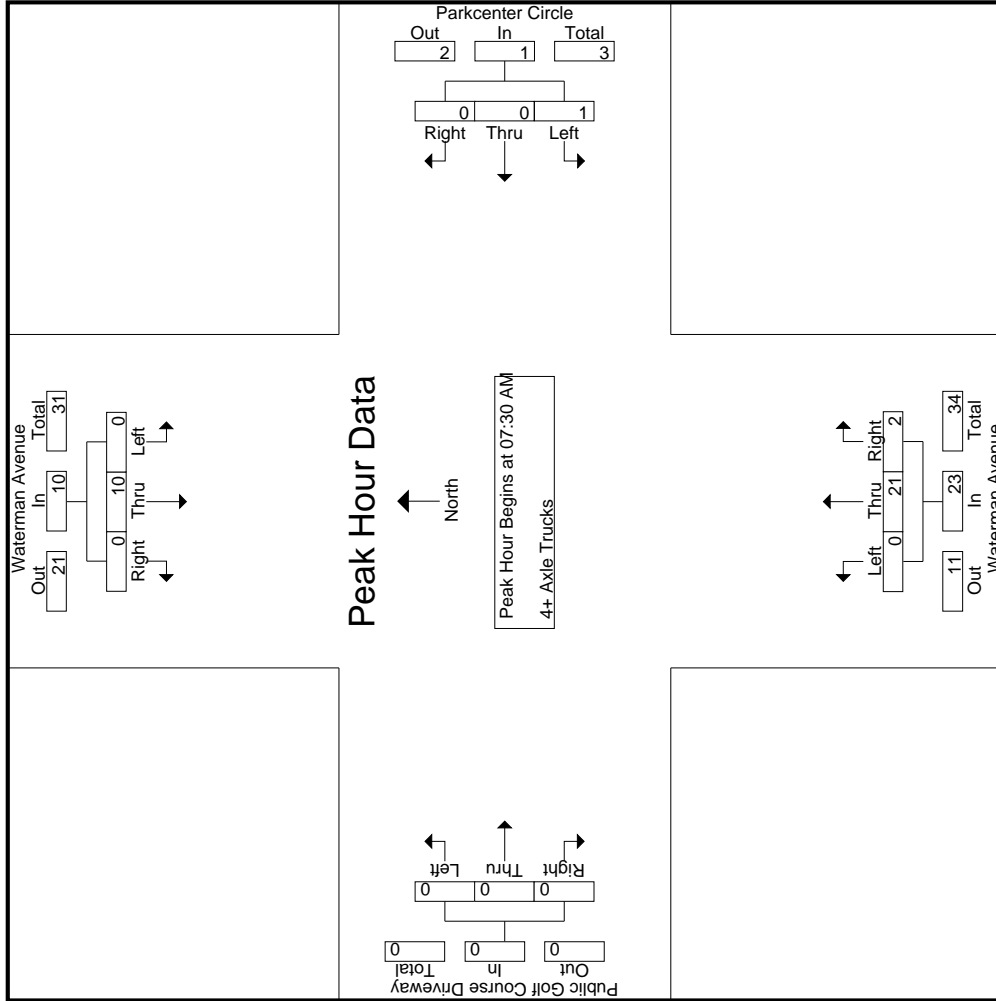
Start Time	Waterman Avenue Southbound					Parkcenter Circle Westbound					Waterman Avenue Northbound					Public Golf Course Driveway Eastbound								
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
07:30 AM	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	1	0	0	1	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	0	0	0	0
08:00 AM	0	4	0	0	4	0	0	0	0	0	0	7	1	0	8	0	0	0	0	0	0	0	0	0
08:15 AM	0	2	0	0	2	1	0	0	0	1	0	7	0	0	7	0	0	0	0	0	0	0	0	0
Total Volume	0	10	0	0	10	1	0	0	0	1	0	21	2	0	23	0	0	0	0	0	0	0	0	0
% App. Total	0	100	0	0		100	0	0	0		0	91.3	8.7			0	0	0	0	0	0	0	0	0
PHF	.000	.625	.000	.000	.625	.250	.000	.000	.000	.250	.000	.750	.500	.000	.719	.000	.000	.000	.000	.000	.000	.000	.708	

Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:30 AM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle (South)
 Weather: Clear

File Name : 10-SBCWTPAAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle (South)
 Weather: Clear

File Name : 10-SBCWTPAAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Waterman Avenue Southbound				Parkcenter Circle Westbound				Waterman Avenue Northbound				Public Golf Course Driveway Eastbound			
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																
Peak Hour for Each Approach Begins at:																
	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	4	0	4	0	0	0	0	0	7	1	8	0	0	0	0
+45 mins.	0	2	0	2	1	0	0	1	0	7	0	7	0	0	0	0
Total Volume	0	10	0	10	1	0	0	1	0	21	2	23	0	0	0	0
% App. Total	0	100	0	100	0	0	0	0	0	91.3	8.7	23	0	0	0	0
PHF	.000	.625	.000	.625	.250	.000	.000	.250	.000	.750	.500	.719	.000	.000	.000	.000

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle (south)
 Weather: Clear

File Name : 10-SBCWTPAPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	Waterman Avenue Southbound					Parkcenter Circle Westbound					Waterman Avenue Northbound					Public Golf Course Driveway Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	3	287	3	0	293	14	0	4	1	18	2	224	4	0	230	1	0	6	2	7	3	548	551
04:15 PM	2	305	2	1	309	13	0	1	0	14	1	211	3	0	215	1	0	1	1	2	2	540	542
04:30 PM	4	279	1	0	284	9	0	2	0	11	0	220	1	0	221	1	0	6	5	7	5	523	528
04:45 PM	0	297	0	0	297	28	0	9	5	37	4	254	3	0	261	2	0	5	2	7	7	602	609
Total	9	1168	6	1	1183	64	0	16	6	80	7	909	11	0	927	5	0	18	10	23	17	2213	2230
05:00 PM	3	301	2	0	306	49	0	15	3	64	1	291	2	0	294	4	0	6	4	10	7	674	681
05:15 PM	1	303	0	0	304	17	0	6	4	23	0	277	3	0	280	1	0	3	2	4	6	611	617
05:30 PM	3	261	0	0	264	5	0	2	0	7	3	247	3	0	253	1	0	4	3	5	3	529	532
05:45 PM	1	240	0	0	241	5	0	5	0	10	0	211	1	0	212	8	0	4	3	12	3	475	478
Total	8	1105	2	0	1115	76	0	28	7	104	4	1026	9	0	1039	14	0	17	12	31	19	2289	2308
Grand Total	17	2273	8	1	2298	140	0	44	13	184	11	1935	20	0	1966	19	0	35	22	54	36	4502	4538
Approach %	0.7	98.9	0.3			76.1	0	23.9			0.6	98.4	1			35.2	0	64.8					
Total %	0.4	50.5	0.2		51	3.1	0	1		4.1	0.2	43	0.4		43.7	0.4	0	0.8		1.2	0.8	99.2	
Passenger Vehicles	13	2225	8		2247	136	0	44		193	11	1893	16		1920	19	0	32		72	0	0	4432
% Passenger Vehicles	76.5	97.9	100		97.7	97.1	0	100		100	100	97.8	80		97.7	100	0	91.4		95.5	94.7	0	97.7
Large 2 Axle Vehicles	2	21	0		23	3	0	0		3	0	24	2		26	0	0	3		4	0	0	56
% Large 2 Axle Vehicles	11.8	0.9	0		1	2.1	0	0		1.5	0	1.2	10		1.3	0	0	8.6		4.5	5.3	0	1.2
3 Axle Vehicles	2	8	0		10	0	0	0		0	0	4	1		5	0	0	0		0	0	0	15
% 3 Axle Vehicles	11.8	0.4	0		0.4	0	0	0		0	0	0.2	5		0.3	0	0	0		0	0	0	0.3
4+ Axle Trucks	0	19	0		19	1	0	0		1	0	14	1		15	0	0	0		0	0	0	35
% 4+ Axle Trucks	0	0.8	0		0.8	0.7	0	0		0.5	0	0.7	5		0.8	0	0	0		0	0	0	0.8

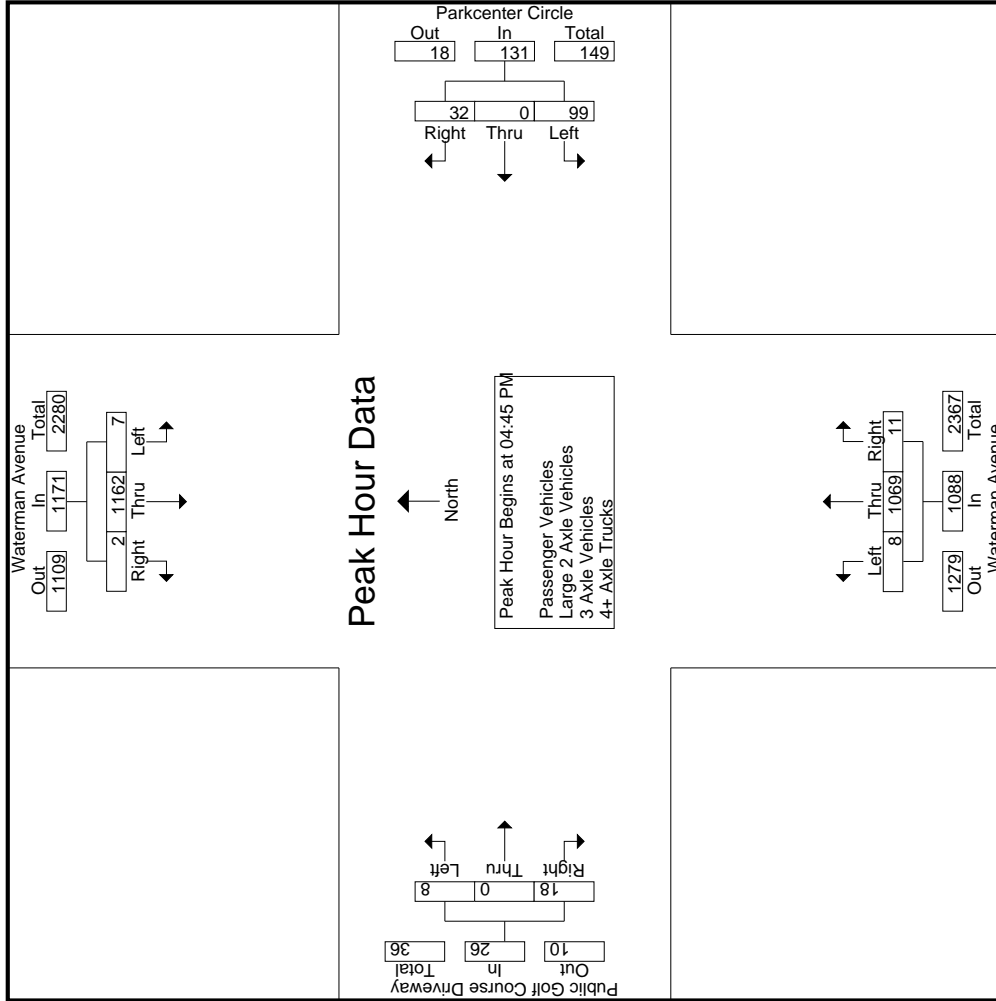
Start Time	Waterman Avenue Southbound					Parkcenter Circle Westbound					Waterman Avenue Northbound					Public Golf Course Driveway Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:45 PM	0	297	0		297	28	0	9		37	4	254	3		261	2	0	5		7			602
05:00 PM	3	301	2		306	49	0	15		64	1	291	2		294	4	0	6		10			674
05:15 PM	1	303	0		304	17	0	6		23	0	277	3		280	1	0	3		4			611
05:30 PM	3	261	0		264	5	0	2		7	3	247	3		253	1	0	4		5			529
Total Volume	7	1162	2		1171	99	0	32		131	8	1069	11		1088	8	0	18		26			2416
% App. Total	0.6	99.2	0.2			75.6	0	24.4			0.7	98.3	1			30.8	0	69.2					
PHF	.583	.959	.250		.957	.505	.000	.533		.512	.500	.918	.917		.925	.500	.000	.750		.650			.896

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:45 PM

Counts Unlimited
 PO Box 1178
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 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle (south)
 Weather: Clear

File Name : 10-SBCWTPAPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle (south)
 Weather: Clear

File Name : 10-SBCWTPAPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Waterman Avenue Southbound				Parkcenter Circle Westbound				Waterman Avenue Northbound				Public Golf Course Driveway Eastbound			
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																
Peak Hour for Each Approach Begins at:																
	04:15 PM				04:30 PM				04:45 PM				05:00 PM			
+0 mins.	2	305	2	309	9	0	2	11	4	254	3	261	4	0	6	10
+15 mins.	4	279	1	284	28	0	9	37	1	291	2	294	1	0	3	4
+30 mins.	0	297	0	297	49	0	15	64	0	277	3	280	1	0	4	5
+45 mins.	3	301	2	306	17	0	6	23	3	247	3	253	8	0	4	12
Total Volume	9	1182	5	1196	103	0	32	135	8	1069	11	1088	14	0	17	31
% App. Total	0.8	98.8	0.4	98.8	76.3	0	23.7	0.7	0.7	98.3	1	45.2	0	0	54.8	0
PHF	.563	.969	.625	.968	.526	.000	.533	.527	.500	.918	.917	.925	.438	.000	.708	.646

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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle (south)
 Weather: Clear

File Name : 10-SBCWTPAPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles

Start Time	Waterman Avenue Southbound					Parkcenter Circle Westbound					Waterman Avenue Northbound					Public Golf Course Driveway Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	1	280	3	0	284	14	0	4	1	18	2	215	3	0	220	1	0	5	2	6	3	528	531
04:15 PM	2	298	2	1	302	11	0	1	0	12	1	207	3	0	211	1	0	1	1	2	2	527	529
04:30 PM	3	275	1	0	279	9	0	2	0	11	0	216	1	0	217	1	0	6	5	7	5	514	519
04:45 PM	0	292	0	0	292	27	0	9	5	36	4	250	3	0	257	2	0	5	2	7	7	592	599
Total	6	1145	6	1	1157	61	0	16	6	77	7	888	10	0	905	5	0	17	10	22	17	2161	2178
05:00 PM	3	298	2	0	303	49	0	15	3	64	1	289	2	0	292	4	0	4	3	8	6	667	673
05:15 PM	0	296	0	0	296	17	0	6	4	23	0	273	2	0	275	1	0	3	2	4	6	598	604
05:30 PM	3	252	0	0	255	5	0	2	0	7	3	239	1	0	243	1	0	4	3	5	3	510	513
05:45 PM	1	234	0	0	235	4	0	5	0	9	0	204	1	0	205	8	0	4	3	12	3	461	464
Total	7	1080	2	0	1089	75	0	28	7	103	4	1005	6	0	1015	14	0	15	11	29	18	2236	2254
Grand Total	13	2225	8	1	2246	136	0	44	13	180	11	1893	16	0	1920	19	0	32	21	51	35	4397	4432
Approach %	0.6	99.1	0.4		75.6	0	24.4			4.1	0.6	98.6	0.8		43.7	0	62.7		1.2		0.8	99.2	
Total %	0.3	50.6	0.2		51.1	3.1	0	1			0.3	43.1	0.4			0.4	0	0.7					

Start Time	Waterman Avenue Southbound					Parkcenter Circle Westbound					Waterman Avenue Northbound					Public Golf Course Driveway Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:45 PM	0	292	0	0	292	27	0	9	0	36	4	250	3	0	257	2	0	5	2	0	5	7	592
05:00 PM	3	298	2	0	303	49	0	15	3	64	1	289	2	0	292	4	0	4	3	8	6	667	673
05:15 PM	0	296	0	0	296	17	0	6	4	23	0	273	2	0	275	1	0	3	2	4	6	598	604
05:30 PM	3	252	0	0	255	5	0	2	0	7	3	239	1	0	243	1	0	4	3	5	3	510	513
05:45 PM	1	234	0	0	235	4	0	5	0	9	0	204	1	0	205	8	0	4	3	12	3	461	464
Total	7	1080	2	0	1089	75	0	28	7	103	4	1005	6	0	1015	14	0	15	11	29	18	2236	2254
Grand Total	13	2225	8	1	2246	136	0	44	13	180	11	1893	16	0	1920	19	0	32	21	51	35	4397	4432
Approach %	0.6	99.1	0.4		75.6	0	24.4			4.1	0.6	98.6	0.8		43.7	0	62.7		1.2		0.8	99.2	
Total %	0.3	50.6	0.2		51.1	3.1	0	1			0.3	43.1	0.4			0.4	0	0.7					

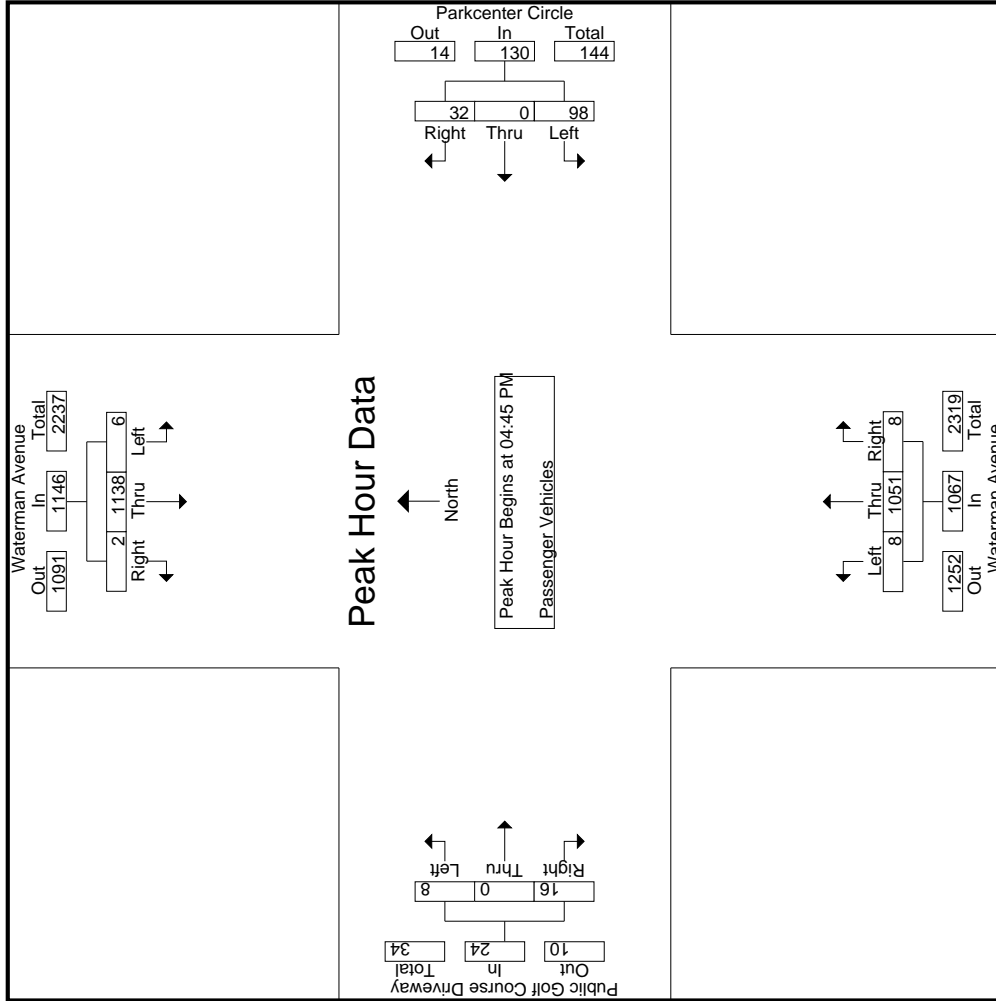
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:45 PM

Start Time	Waterman Avenue Southbound					Parkcenter Circle Westbound					Waterman Avenue Northbound					Public Golf Course Driveway Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:45 PM	0	292	0	0	292	27	0	9	0	36	4	250	3	0	257	2	0	5	2	0	5	7	592
05:00 PM	3	298	2	0	303	49	0	15	3	64	1	289	2	0	292	4	0	4	3	8	6	667	673
05:15 PM	0	296	0	0	296	17	0	6	4	23	0	273	2	0	275	1	0	3	2	4	6	598	604
05:30 PM	3	252	0	0	255	5	0	2	0	7	3	239	1	0	243	1	0	4	3	5	3	510	513
Total Volume	6	1138	2		1146	98	0	32		130	8	1051	8		1067	8	0	16		24	16	2367	2373
% App. Total	0.5	99.3	0.2		75.4	0	24.6			24.6	0.7	98.5	0.7		33.3	0	66.7				0	66.7	67.2
PHF	.500	.955	.250		.946	.500	.000	.533		.508	.500	.909	.667		.914	.500	.800				.750	.887	.887

Counts Unlimited
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 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle (south)
 Weather: Clear

File Name : 10-SBCWTPAPM
 Site Code : 05117141
 Start Date : 3/2/2017
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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle (south)
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File Name : 10-SBCWTPAPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Waterman Avenue Southbound				Parkcenter Circle Westbound				Waterman Avenue Northbound				Public Golf Course Driveway Eastbound			
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																
Peak Hour for Each Approach Begins at:																
	04:45 PM				04:45 PM				04:45 PM				04:45 PM			
+0 mins.	0	292	0	292	27	0	9	36	4	250	3	257	2	0	5	7
+15 mins.	3	298	2	303	49	0	15	64	1	289	2	292	4	0	4	8
+30 mins.	0	296	0	296	17	0	6	23	0	273	2	275	1	0	3	4
+45 mins.	3	252	0	255	5	0	2	7	3	239	1	243	1	0	4	5
Total Volume	6	1138	2	1146	98	0	32	130	8	1051	8	1067	8	0	16	24
% App. Total	0.5	99.3	0.2	99.6	75.4	0	24.6	91.0	0.7	98.5	0.7	99.8	33.3	0	66.7	75.0
PHF	.500	.955	.250	.946	.500	.000	.533	.508	.500	.909	.667	.914	.500	.000	.800	.750

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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle (south)
 Weather: Clear

File Name : 10-SBCWTPAPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Large 2 Axle Vehicles

Start Time	Waterman Avenue Southbound					Parkcenter Circle Westbound					Waterman Avenue Northbound					Public Golf Course Driveway Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	1	4	0	0	5	0	0	0	0	0	0	4	1	0	5	0	0	1	0	1	0	11	11
04:15 PM	0	3	0	0	3	1	0	0	0	1	0	3	0	0	3	0	0	0	0	0	0	7	7
04:30 PM	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	4	4	
04:45 PM	0	1	0	0	1	1	0	0	0	1	0	2	0	0	2	0	0	0	0	0	0	4	4
Total	1	10	0	0	11	2	0	0	0	2	0	11	1	0	12	0	0	1	0	1	0	26	26
05:00 PM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	1	2	1	4	5
05:15 PM	1	2	0	0	3	0	0	0	0	0	3	1	0	4	4	0	0	0	0	0	0	7	7
05:30 PM	0	5	0	0	5	0	0	0	0	0	5	0	0	5	5	0	0	0	0	0	0	10	10
05:45 PM	0	2	0	0	2	1	0	0	0	1	0	5	0	0	5	0	0	0	0	0	0	8	8
Total	1	11	0	0	12	1	0	0	0	1	0	13	1	0	14	0	0	2	1	2	1	29	30
Grand Total	2	21	0	0	23	3	0	0	0	3	0	24	2	0	26	0	0	3	1	3	1	55	56
Approach %	8.7	91.3	0			100	0	0			0	92.3	7.7		47.3	0	0	100		5.5	1.8	98.2	
Total %	3.6	38.2	0		41.8	5.5	0	0		5.5	0	43.6	3.6			0	0	5.5					

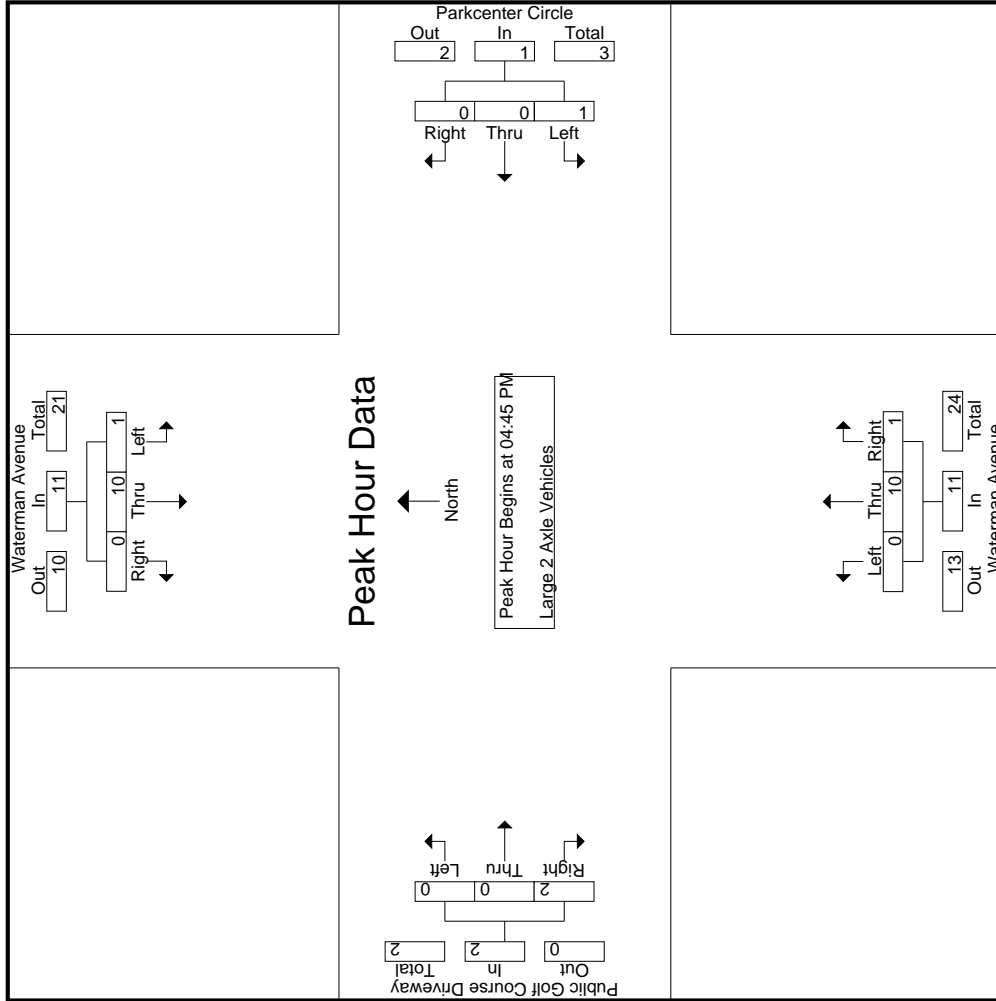
Start Time	Waterman Avenue Southbound					Parkcenter Circle Westbound					Waterman Avenue Northbound					Public Golf Course Driveway Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:45 PM	0	1	0	0	1	1	0	0	0	1	0	2	0	0	2	0	0	0	0	0	0	0	0
05:00 PM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	4
05:15 PM	1	2	0	0	3	0	0	0	0	0	0	3	1	4	4	0	0	0	0	0	0	0	7
05:30 PM	0	5	0	0	5	0	0	0	0	0	0	5	0	5	5	0	0	0	0	0	0	0	10
Total Volume	1	10	0	0	11	1	0	0	0	1	0	10	1	11	11	0	0	2	2	2	0	25	25
% App. Total	9.1	90.9	0			100	0	0			0	90.9	9.1		100	0	0	100					
PHF	.250	.500	.000		.550	.250	.000	.000		.250	.000	.500	.250		.550	.000	.000	.250		.250		.625	

Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:45 PM

Counts Unlimited
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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle (south)
 Weather: Clear

File Name : 10-SBCWTPAPM
 Site Code : 05117141
 Start Date : 3/2/2017
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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle (south)
 Weather: Clear

File Name : 10-SBCWTPAPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Waterman Avenue Southbound				Parkcenter Circle Westbound				Waterman Avenue Northbound				Public Golf Course Driveway Eastbound			
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																
Peak Hour for Each Approach Begins at:																
	04:45 PM				04:45 PM				04:45 PM				04:45 PM			
+0 mins.	0	1	0	1	0	0	0	0	1	0	2	0	0	0	0	0
+15 mins.	0	2	0	2	0	0	0	0	0	0	0	0	0	0	2	2
+30 mins.	1	2	0	3	0	0	0	0	0	3	1	4	0	0	0	0
+45 mins.	0	5	0	5	0	0	0	0	0	5	0	5	0	0	0	0
Total Volume	1	10	0	11	1	0	0	1	1	10	1	11	0	0	2	2
% App. Total	9.1	90.9	0	100	0	0	0	90.9	9.1	90.9	9.1	100	0	0	100	100
PHF	.250	.500	.000	.550	.250	.000	.000	.250	.000	.500	.250	.550	.000	.000	.250	.250

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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle (south)
 Weather: Clear

File Name : 10-SBCWTPAPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 3 Axle Vehicles

Start Time	Waterman Avenue Southbound					Parkcenter Circle Westbound					Waterman Avenue Northbound					Public Golf Course Driveway Eastbound								
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
04:00 PM	1	2	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	3
04:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
04:30 PM	1	2	0	0	3	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	4	4	4
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	1
Total	2	5	0	0	7	0	0	0	0	0	2	2	0	0	2	0	0	0	0	0	0	9	9	9
05:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	1
05:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
05:30 PM	0	1	0	0	1	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	3	3	3
05:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Total	0	3	0	0	3	0	0	0	0	0	2	1	0	0	3	0	0	0	0	0	0	6	6	6
Grand Total	2	8	0	0	10	0	0	0	0	0	4	1	0	0	5	0	0	0	0	0	0	15	15	15
Approach %	20	80	0	0		0	0	0	0	0	80	20	0	0	33.3	0	0	0	0	0	0	100	100	100
Total %	13.3	53.3	0	0	66.7	0	0	0	0	0	26.7	6.7	0	0		0	0	0	0	0	0	100	100	100

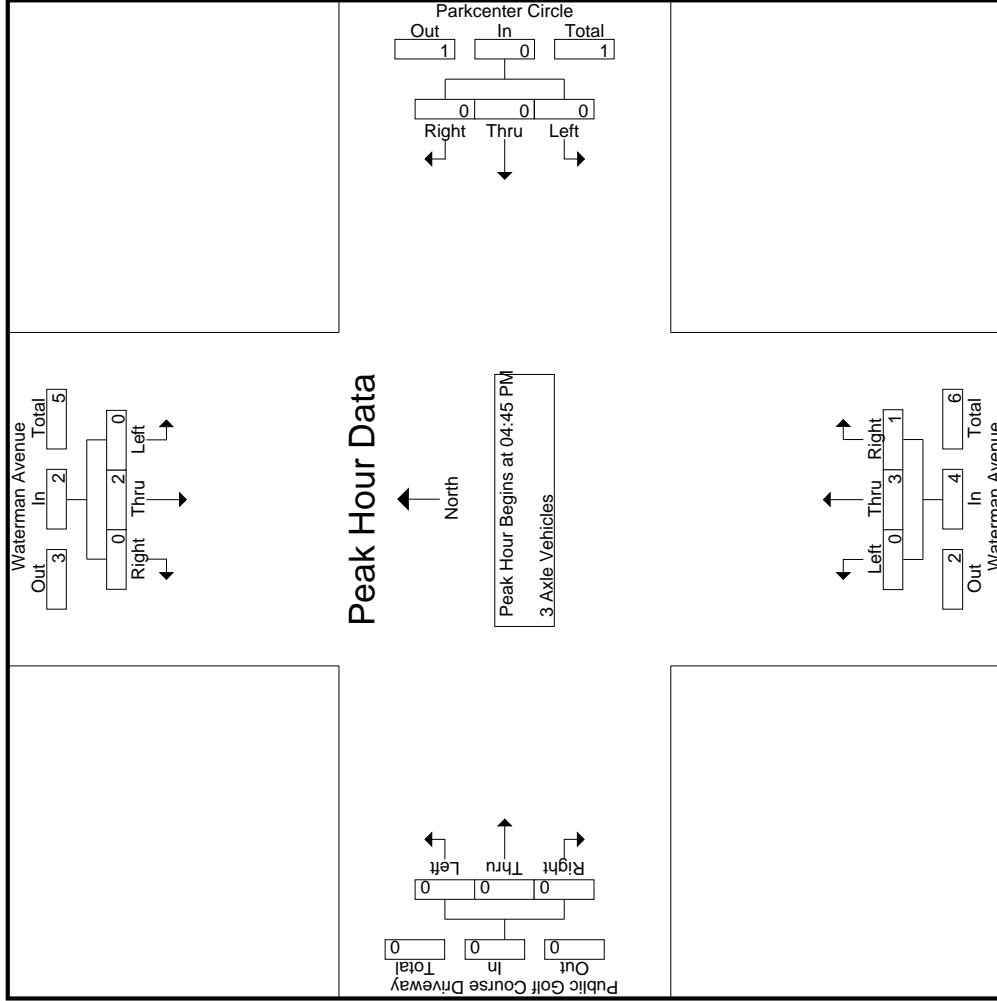
Start Time	Waterman Avenue Southbound					Parkcenter Circle Westbound					Waterman Avenue Northbound					Public Golf Course Driveway Eastbound								
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0
05:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0
Total Volume	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0
% App. Total	0	100	0	0		0	0	0	0	0	75	25	0	0		0	0	0	0	0	0	0	0	0
PHF	.000	.500	.000	.000	.500	.000	.000	.000	.000	.000	.000	.750	.250	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000	.500

Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:45 PM

Counts Unlimited
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 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle (south)
 Weather: Clear

File Name : 10-SBCWTPAPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle (south)
 Weather: Clear

File Name : 10-SBCWTPAPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Waterman Avenue Southbound				Parkcenter Circle Westbound				Waterman Avenue Northbound				Public Golf Course Driveway Eastbound			
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																
Peak Hour for Each Approach Begins at:																
	04:45 PM				04:45 PM				04:45 PM				04:45 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	1	0	1	0	0	0	0	0	0	1	2	0	0	0	0
Total Volume	0	2	0	2	0	0	0	0	0	0	3	4	0	0	0	0
% App. Total	0	100	0	500	0	0	0	0	0	0	75	25	0	0	0	0
PHF	.000	.500	.000	.500	.000	.000	.000	.000	.000	.000	.750	.250	.500	.000	.000	.000

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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle (south)
 Weather: Clear

File Name : 10-SBCWTPAPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 4+ Axle Trucks

Start Time	Waterman Avenue Southbound				Parkcenter Circle Westbound				Waterman Avenue Northbound				Public Golf Course Driveway Eastbound						
	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	1	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	6	6
04:15 PM	0	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	5	5
04:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1
04:45 PM	0	4	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	5	5
Total	0	8	0	0	1	0	0	0	0	8	0	0	0	0	0	0	0	17	17
05:00 PM	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	2
05:15 PM	0	4	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	5	5
05:30 PM	0	3	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	6	6
05:45 PM	0	3	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	5	5
Total	0	11	0	0	0	0	0	0	0	6	1	0	0	0	0	0	0	18	18
Grand Total	0	19	0	0	1	0	0	0	1	14	1	0	0	0	0	0	0	35	35
Approach %	0	100	0	0	0	0	0	0	0	93.3	6.7	0	0	0	0	0	0	100	100
Total %	0	54.3	0	0	0	0	0	0	2.9	40	2.9	0	0	0	0	0	42.9	0	0

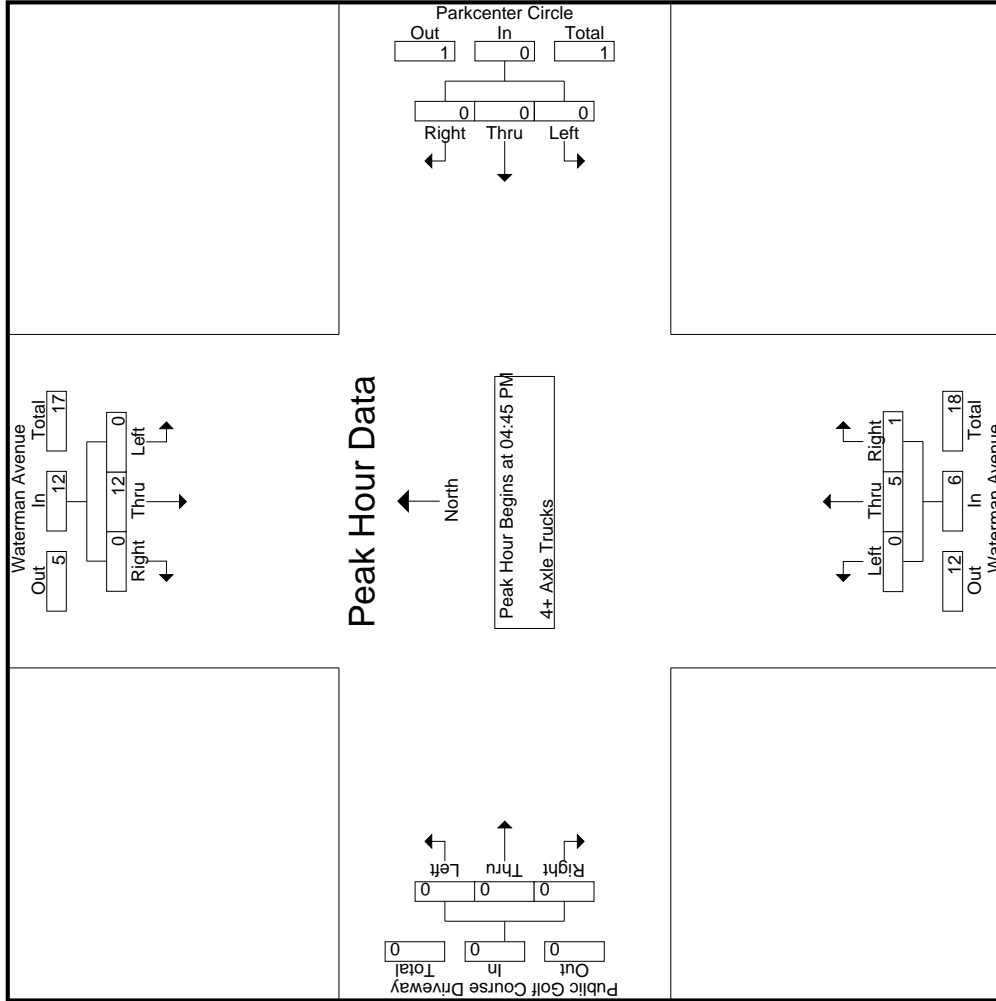
Start Time	Waterman Avenue Southbound				Parkcenter Circle Westbound				Waterman Avenue Northbound				Public Golf Course Driveway Eastbound						
	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Exclu. Total	Inclu. Total	Int. Total
04:45 PM	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
05:15 PM	0	4	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
05:30 PM	0	3	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0
Total Volume	0	12	0	0	0	0	0	0	0	5	1	0	0	0	0	0	0	0	0
% App. Total	0	100	0	0	0	0	0	0	0	83.3	16.7	0	0	0	0	0	0	0	0
PHF	.000	.750	.000	.000	.000	.000	.000	.000	.000	.625	.250	.000	.500	.000	.000	.000	.000	.000	.750

Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:45 PM

Counts Unlimited
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 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle (south)
 Weather: Clear

File Name : 10-SBCWTPAPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



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 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle (south)
 Weather: Clear

File Name : 10-SBCWTPAPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Waterman Avenue Southbound			Parkcenter Circle Westbound			Waterman Avenue Northbound			Public Golf Course Driveway Eastbound				
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	04:45 PM												04:45 PM	
+0 mins.	0	4	0	0	0	0	0	0	1	0	0	0	0	0
+15 mins.	0	1	0	0	0	0	0	1	0	0	0	0	1	0
+30 mins.	0	4	0	0	0	0	0	1	0	0	0	0	1	0
+45 mins.	0	3	0	0	0	0	0	2	1	0	0	0	3	0
Total Volume	0	12	0	0	0	0	0	5	1	0	0	0	6	0
% App. Total	0	100	0	0	0	0	0	83.3	16.7	0	0	0	500	0
PHF	.000	.750	.000	.000	.000	.000	.000	.625	.250	.000	.000	.000	.500	.000

Location: San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle



Date: 3/2/2017
 Day: Thursday

PEDESTRIANS

	North Leg Waterman Avenue	East Leg Parkcenter Circle	South Leg Waterman Avenue	West Leg Golf Course Driveway	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

	North Leg Waterman Avenue	East Leg Parkcenter Circle	South Leg Waterman Avenue	West Leg Golf Course Driveway	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	1	0	0	1
5:15 PM	1	0	0	1	2
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	1	1
TOTAL VOLUMES:	1	1	0	2	4

Location: San Bernardino
 N/S: Waterman Avenue
 E/W: Parkcenter Circle



Date: 3/2/2017
 Day: Thursday

BICYCLES

	North Leg Waterman Avenue	East Leg Parkcenter Circle	South Leg Waterman Avenue	West Leg Golf Course Driveway	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	2	0	0	2
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	2	2
8:30 AM	0	0	0	0	0
8:45 AM	0	1	0	1	2
TOTAL VOLUMES:	0	3	0	3	6

	North Leg Waterman Avenue	East Leg Parkcenter Circle	South Leg Waterman Avenue	West Leg Golf Course Driveway	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	1	1
4:30 PM	0	0	0	0	0
4:45 PM	0	1	0	0	1
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	1	1
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	1	0	2	3

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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane
 Weather: Clear

File Name : SBCWAHOAM REDO
 Site Code : 05117141
 Start Date : 3/8/2017
 Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	Waterman Avenue Southbound					Hospitality Lane Westbound					Waterman Avenue Northbound					Hospitality Lane Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
	07:00 AM	17	62	21	15	100	50	62	13	2	125	33	167	131	90	331	14	24	19	10	57	117	613
07:15 AM	10	80	21	8	111	67	74	11	3	152	55	213	160	93	428	30	23	18	9	71	113	762	875
07:30 AM	16	101	43	25	160	75	77	11	2	163	68	177	203	93	448	28	33	28	19	89	139	860	999
07:45 AM	25	82	38	26	145	104	116	14	4	234	83	222	192	109	497	41	38	28	14	107	153	983	1136
Total	68	325	123	74	516	296	329	49	11	674	239	779	686	385	1704	113	118	93	52	324	522	3218	3740
08:00 AM	16	101	26	18	143	74	99	20	4	193	63	168	190	99	421	52	57	31	16	140	137	897	1034
08:15 AM	17	106	31	22	154	87	89	19	4	195	64	186	202	101	452	34	41	38	20	113	147	914	1061
08:30 AM	21	101	26	19	148	73	93	17	1	183	64	145	184	97	393	31	25	48	26	104	143	828	971
08:45 AM	15	87	35	28	137	79	67	19	4	165	69	172	174	83	415	29	26	48	29	103	144	820	964
Total	69	395	118	87	582	313	348	75	13	736	260	671	750	380	1681	146	149	165	91	460	571	3459	4030
Grand Total	137	720	241	161	1098	609	677	124	24	1410	499	1450	1436	765	3385	259	267	258	143	784	1093	6677	7770
Approach %	12.5	65.6	21.9			43.2	48	8.8			14.7	42.8	42.4			33	34.1	32.9					
Total %	2.1	10.8	3.6		16.4	9.1	10.1	1.9		21.1	7.5	21.7	21.5		50.7	3.9	4	3.9		11.7	14.1	85.9	
Passenger Vehicles	122	650	235		1165	585	655	118		1381	491	1382	1414		4050	254	251	250		892	0	0	7488
% 3 Axle Vehicles	89.1	90.3	97.5	98.1	92.5	96.1	96.8	95.2	95.8	96.3	98.4	95.3	98.5	99.7	97.6	98.1	94	96.9	95.8	96.2	0	0	96.4
Large 2 Axle Vehicles	6	34	4		46	8	6	1		16	3	34	9		47	5	4	5		17	0	0	126
% Large 2 Axle Vehicles	4.4	4.7	1.7	1.2	3.7	1.3	0.9	0.8	4.2	1.1	0.6	2.3	0.6	0.1	1.1	1.9	1.5	1.9	2.1	1.8	0	0	1.6
3 Axle Vehicles	0	18	1		19	4	15	2		21	2	12	6		20	0	12	1		14	0	0	74
% 3 Axle Vehicles	0	2.5	0.4	0	1.5	0.7	2.2	1.6	0	1.5	0.4	0.8	0.4	0	0.5	0	4.5	0.4	0.7	1.5	0	0	1
4+ Axle Trucks	9	18	1		29	12	1	3		16	3	22	7		33	0	0	2		4	0	0	82
% 4+ Axle Trucks	6.6	2.5	0.4	0.6	2.3	2	0.1	2.4	0	1.1	0.6	1.5	0.5	0.1	0.8	0	0	0.8	1.4	0.4	0	0	1.1

Start Time	Waterman Avenue Southbound					Hospitality Lane Westbound					Waterman Avenue Northbound					Hospitality Lane Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
	07:30 AM	16	101	43		160	75	77			11	68	177			203	28	33			89		
07:45 AM	25	82	38		145	104	116			14	83	222			192	41	38			107			983
08:00 AM	16	101	26		143	74	99			20	63	168			190	52	57			140			897
08:15 AM	17	106	31		154	87	89			19	64	186			202	34	41			113			914
Total Volume	74	390	138		602	340	381			64	278	753			787	155	169			449			3654
% App. Total	12.3	64.8	22.9		802	43.3	48.5			8.2	15.3	41.4			43.3	34.5	37.6			27.8			929
PHF	.740	.920	.802		.941	.817	.821			.800	.837	.848			.969	.745	.741			.822			.929

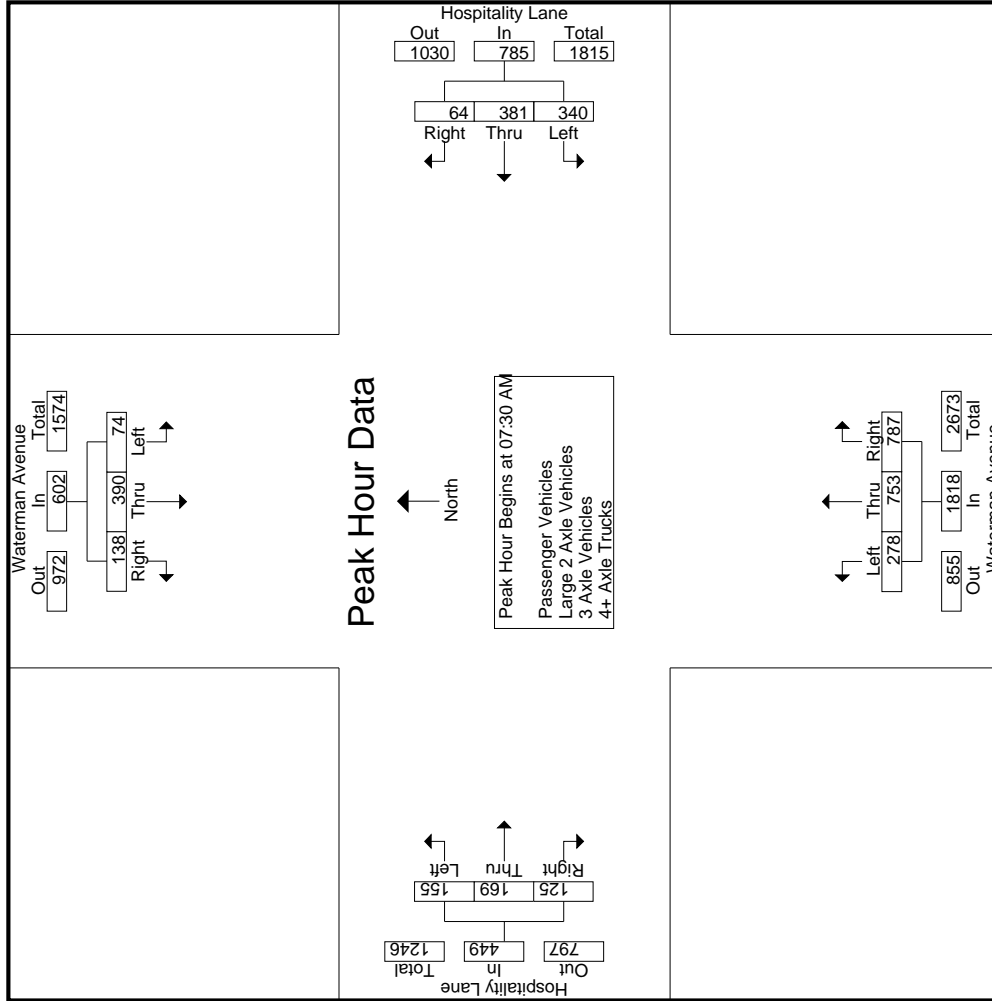
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:30 AM

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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane
 Weather: Clear

File Name : SBCWAHOAM REDO
 Site Code : 05117141
 Start Date : 3/8/2017
 Page No : 2



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File Name : SBCWAHOAM REDO
 Site Code : 05117141
 Start Date : 3/8/2017
 Page No : 3

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane
 Weather: Clear

Start Time	Waterman Avenue Southbound			Hospitality Lane Westbound			Waterman Avenue Northbound			Hospitality Lane Eastbound				
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	07:30 AM													
+0 mins.	16	101	43	160	104	116	14	234	68	177	203	448	07:45 AM	107
+15 mins.	25	82	38	145	74	99	20	193	83	222	192	497	41	140
+30 mins.	16	101	26	143	87	89	19	195	63	168	190	421	34	113
+45 mins.	17	106	31	154	73	93	17	183	64	186	202	452	31	104
Total Volume	74	390	138	602	338	397	70	805	278	753	787	1818	158	464
% App. Total	12.3	64.8	22.9	941	42	49.3	8.7	860	15.3	41.4	43.3	914	34.1	31.2
PHF	.740	.920	.802	.941	.813	.856	.875	.860	.837	.848	.969	.914	.760	.755

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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane
 Weather: Clear

File Name : SBCWAHOAM REDO
 Site Code : 05117141
 Start Date : 3/8/2017
 Page No : 1

Groups Printed- Passenger Vehicles

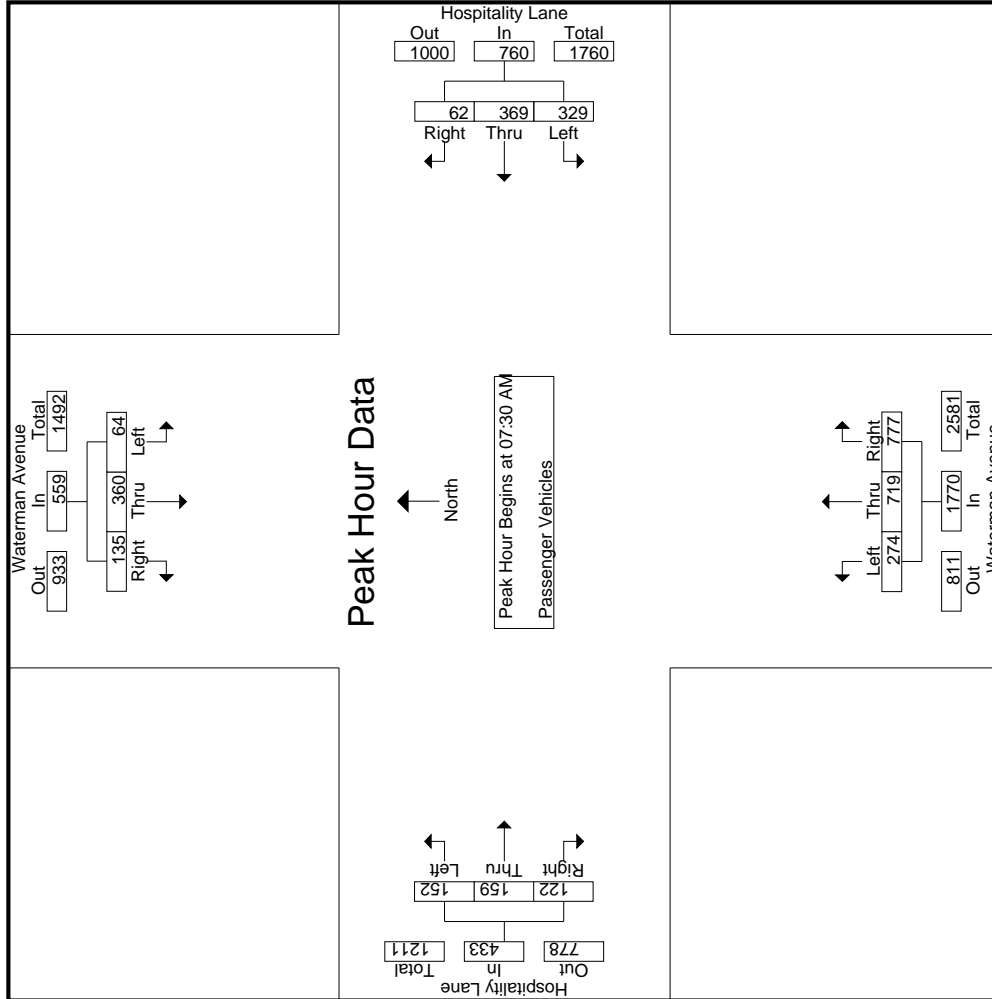
Start Time	Waterman Avenue Southbound					Hospitality Lane Westbound					Waterman Avenue Northbound					Hospitality Lane Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	16	53	21	15	90	50	59	11	2	120	32	161	130	90	323	14	24	19	10	57	117	590	707
07:15 AM	8	69	20	8	97	66	72	11	3	149	54	206	159	93	419	30	21	17	8	68	112	733	845
07:30 AM	13	92	42	25	147	73	75	10	1	158	66	169	202	93	437	28	31	27	18	86	137	828	965
07:45 AM	24	74	38	26	136	100	113	14	4	227	83	213	190	109	486	41	36	27	13	104	152	953	1105
Total	61	288	121	74	470	289	319	46	10	654	235	749	681	385	1665	113	112	90	49	315	518	3104	3622
08:00 AM	13	95	25	18	133	72	96	20	4	188	62	162	187	99	411	50	56	31	16	137	137	869	1006
08:15 AM	14	99	30	21	143	84	85	18	4	187	63	175	198	101	436	33	36	37	20	106	146	872	1018
08:30 AM	20	89	26	19	135	70	90	15	1	175	62	134	177	96	373	31	24	46	24	101	140	784	924
08:45 AM	14	79	33	26	126	70	65	19	4	154	69	162	171	82	402	27	23	46	28	96	140	778	918
Total	61	362	114	84	537	296	336	72	13	704	256	633	733	378	1622	141	139	160	88	440	563	3303	3866
Grand Total	122	650	235	158	1007	585	655	118	23	1358	491	1382	1414	763	3287	254	251	250	137	755	1081	6407	7488
Approach %	12.1	64.5	23.3			43.1	48.2	8.7			14.9	42	43			33.6	33.2	33.1			14.4	85.6	
Total %	1.9	10.1	3.7		15.7	9.1	10.2	1.8		21.2	7.7	21.6	22.1		51.3	4	3.9	3.9		11.8	14.4	85.6	

Start Time	Waterman Avenue Southbound					Hospitality Lane Westbound					Waterman Avenue Northbound					Hospitality Lane Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:30 AM	13	92	42		147	73	75	10		158	66	169	202		437	28	31	27		86			828
07:45 AM	24	74	38		136	100	113	14		227	83	213	190		486	41	36	27		104			953
08:00 AM	13	95	25		133	72	96	20		188	62	162	187		411	50	56	31		137			869
08:15 AM	14	79	33		143	84	85	18		175	63	175	198		436	33	36	37		106			872
Total Volume	64	360	135		559	329	369	62		760	274	719	777		1770	152	159	122		433			3522
% App. Total	11.4	64.4	24.2			43.3	48.6	8.2			15.5	40.6	43.9			35.1	36.7	28.2					
PHF	.667	.909	.804		.951	.823	.816	.775		.837	.825	.844	.962		.910	.760	.710	.824		.790			.924

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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane
 Weather: Clear

File Name : SBCWAHOAM REDO
 Site Code : 05117141
 Start Date : 3/8/2017
 Page No : 2



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File Name : SBCWAHOAM REDO
 Site Code : 05117141
 Start Date : 3/8/2017
 Page No : 3

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane
 Weather: Clear

Start Time	Waterman Avenue Southbound			Hospitality Lane Westbound			Waterman Avenue Northbound			Hospitality Lane Eastbound							
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total				
+0 mins.	13	92	42	147	73	75	10	158	66	169	202	437	07:30 AM	28	31	27	86
+15 mins.	24	74	38	136	100	113	14	227	83	213	190	486	07:30 AM	41	36	27	104
+30 mins.	13	95	25	133	72	96	20	188	62	162	187	411	07:30 AM	50	56	31	137
+45 mins.	14	99	30	143	84	85	18	187	63	175	198	436	07:30 AM	33	36	37	106
Total Volume	64	360	135	559	329	369	62	760	274	719	777	1770	07:30 AM	152	159	122	433
% App. Total	11.4	64.4	24.2		43.3	48.6	8.2		15.5	40.6	43.9		07:30 AM	35.1	36.7	28.2	
PHF	.667	.909	.804	.951	.823	.816	.775	.837	.825	.844	.962	.910	07:30 AM	.760	.710	.824	.790

Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

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 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane
 Weather: Clear

File Name : SBCWAHOAM REDO
 Site Code : 05117141
 Start Date : 3/8/2017
 Page No : 1

Groups Printed- Large 2 Axle Vehicles

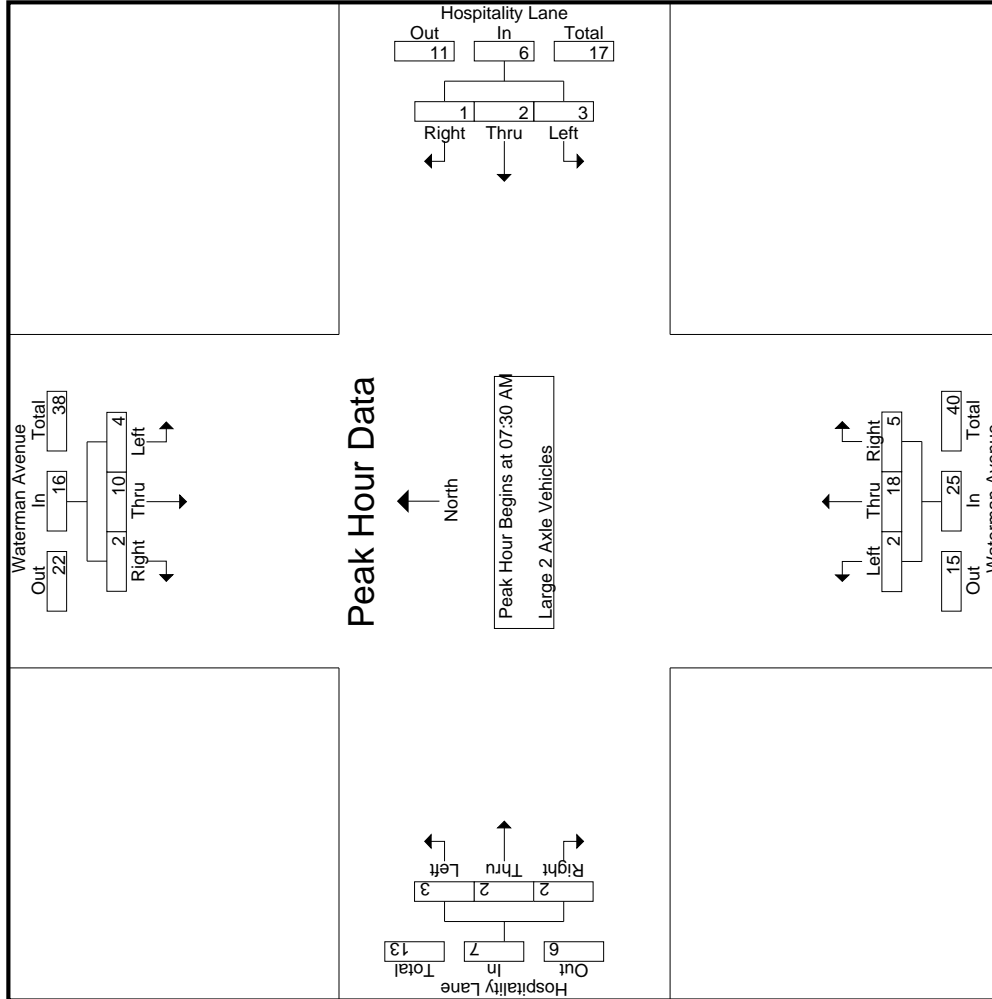
Start Time	Waterman Avenue Southbound				Hospitality Lane Westbound				Waterman Avenue Northbound				Hospitality Lane Eastbound					
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	6	0	0	6	0	1	0	0	1	0	3	0	0	0	0	10	10
07:15 AM	1	6	1	0	8	1	1	0	0	2	1	4	0	0	1	1	16	17
07:30 AM	1	2	0	0	3	0	0	1	1	1	1	4	0	0	1	2	10	12
07:45 AM	0	2	0	0	2	1	1	0	0	2	0	7	2	0	0	0	13	13
Total	2	16	1	0	19	2	3	1	1	6	2	18	2	0	2	3	49	52
08:00 AM	1	2	1	0	4	0	0	0	0	0	4	2	0	0	0	0	12	12
08:15 AM	2	4	1	1	7	2	1	0	0	3	1	3	1	0	4	1	19	20
08:30 AM	0	6	0	0	6	2	1	0	0	3	0	4	2	1	1	2	17	19
08:45 AM	1	6	1	1	8	2	1	0	0	3	0	5	2	0	4	1	22	23
Total	4	18	3	2	25	6	3	0	0	9	1	16	7	1	12	4	70	74
Grand Total	6	34	4	2	44	8	6	1	1	15	3	34	9	1	46	7	119	126
Approach %	13.6	77.3	9.1		53.3	6.7	40	6.7		12.6	6.5	73.9	19.6		38.7	35.7	28.6	35.7
Total %	5	28.6	3.4		37	6.7	5	0.8			2.5	28.6	7.6		11.8	5.6	94.4	94.4

Start Time	Waterman Avenue Southbound				Hospitality Lane Westbound				Waterman Avenue Northbound				Hospitality Lane Eastbound					
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:30 AM	1	2	0		3	0	0	0		1	1	4	0		5	0	1	10
07:45 AM	0	2	0		2	1	1	0		0	0	7	2		9	0	0	13
08:00 AM	1	2	1		4	0	0	0		0	0	4	2		6	0	0	12
08:15 AM	2	4	1		7	2	1	0		3	1	3	1		5	1	4	19
Total Volume	4	10	2		16	3	2	1		6	2	18	5		25	3	2	54
% App. Total	25	62.5	12.5		33.3	16.7	50	33.3		42.9	28.6	28.6	28.6		28.6	5.6	94.4	94.4
PHF	.500	.625	.500		.571	.375	.500	.250		.694	.375	.500	.250		.438	.711	.711	.711

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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane
 Weather: Clear

File Name : SBCWAHOAM REDO
 Site Code : 05117141
 Start Date : 3/8/2017
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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane
 Weather: Clear

File Name : SBCWAHOAM REDO
 Site Code : 05117141
 Start Date : 3/8/2017
 Page No : 3

Start Time	Waterman Avenue Southbound			Hospitality Lane Westbound			Waterman Avenue Northbound			Hospitality Lane Eastbound				
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	07:30 AM													
+0 mins.	1	2	0	0	0	1	1	1	4	0	0	0	5	1
+15 mins.	0	2	0	1	1	0	2	7	2	0	0	0	9	0
+30 mins.	1	2	1	0	0	0	0	4	2	0	0	0	6	2
+45 mins.	2	4	1	2	1	0	3	3	1	2	1	2	5	4
Total Volume	4	10	2	3	2	1	6	18	5	2	2	2	25	7
% App. Total	25	62.5	12.5	50	33.3	16.7	8	72	20	42.9	28.6	28.6	694	438
PHF	.500	.625	.500	.375	.500	.250	.500	.643	.625	.375	.250	.500	.694	.438

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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane
 Weather: Clear

File Name : SBCWAHOAM REDO
 Site Code : 05117141
 Start Date : 3/8/2017
 Page No : 1

Groups Printed- 3 Axle Vehicles

Start Time	Waterman Avenue Southbound				Hospitality Lane Westbound				Waterman Avenue Northbound				Hospitality Lane Eastbound					
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	2	0	0	2	0	2	1	0	3	0	0	1	0	0	0	0	6
07:15 AM	0	2	0	0	2	0	1	0	0	1	0	2	0	0	2	0	7	7
07:30 AM	0	5	1	0	6	0	2	0	0	2	1	0	1	0	2	0	12	12
07:45 AM	0	2	0	0	2	1	2	0	0	3	0	0	0	1	3	1	8	9
Total	0	11	1	0	12	1	7	1	0	9	1	2	2	0	5	1	33	34
08:00 AM	0	1	0	0	1	0	3	0	0	3	0	0	1	0	0	0	6	6
08:15 AM	0	0	0	0	0	0	2	1	0	3	0	4	1	0	5	0	11	11
08:30 AM	0	4	0	0	4	1	2	0	0	3	1	5	2	0	8	0	15	15
08:45 AM	0	2	0	0	2	2	1	0	0	3	0	1	0	0	1	0	8	8
Total	0	7	0	0	7	3	8	1	0	12	1	10	4	0	15	0	40	40
Grand Total	0	18	1	0	19	4	15	2	0	21	2	12	6	0	20	0	73	74
Approch %	0	94.7	5.3			19	71.4	9.5		28.8	10	60	30		27.4	0	92.3	7.7
Total %	0	24.7	1.4			5.5	20.5	2.7		9.1	2.7	16.4	8.2		16.4	0	17.8	1.4

Start Time	Waterman Avenue Southbound				Hospitality Lane Westbound				Waterman Avenue Northbound				Hospitality Lane Eastbound					
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:30 AM	0	5	1		6	0	2	0		2	1	0	1		2	0	2	12
07:45 AM	0	2	0		2	1	2	0		3	0	0	0		0	0	3	8
08:00 AM	0	1	0		1	0	3	0		3	0	1	0		1	0	1	6
08:15 AM	0	0	0		0	0	2	1		3	0	4	1		5	0	3	11
Total Volume	0	8	1		9	1	9	1		11	1	4	3		8	0	9	37
% App. Total	0	88.9	11.1			9.1	81.8	9.1		91.7	12.5	50	37.5		88.9	0	11.1	
PHF	.000	.400	.250		.375	.250	.750	.250		.917	.250	.250	.750		.667	.250	.750	.771

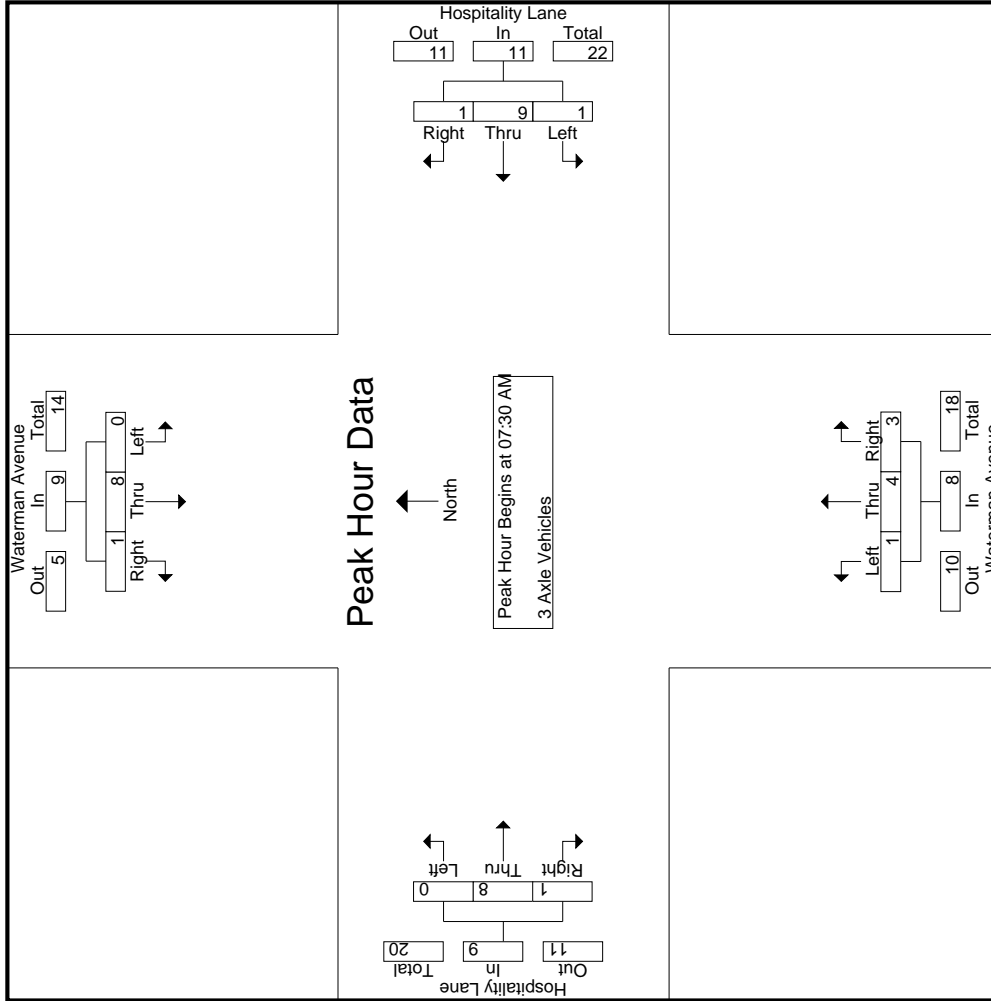
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:30 AM

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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane
 Weather: Clear

File Name : SBCWAHOAM REDO
 Site Code : 05117141
 Start Date : 3/8/2017
 Page No : 2



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 Corona, CA 92878
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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane
 Weather: Clear

File Name : SBCWAHOAM REDO
 Site Code : 05117141
 Start Date : 3/8/2017
 Page No : 3

Start Time	Waterman Avenue Southbound			Hospitality Lane Westbound			Waterman Avenue Northbound			Hospitality Lane Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
+0 mins.	0	5	1	0	2	0	0	0	0	1	2	0	2	2
+15 mins.	0	2	0	1	2	0	0	0	0	0	0	0	0	2
+30 mins.	0	1	0	0	3	0	0	0	0	0	1	0	1	1
+45 mins.	0	0	0	0	2	1	0	4	1	1	0	0	3	0
Total Volume	0	8	1	1	9	1	11	4	3	8	5	3	8	9
% App. Total	0	88.9	11.1	9.1	81.8	9.1	12.5	50	37.5	0	88.9	11.1	0	88.9
PHF	.000	.400	.250	.250	.750	.250	.917	.250	.750	.400	.667	.250	.000	.750

Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:
 07:30 AM

Counts Unlimited, Inc.
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 Corona, CA 92878
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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane
 Weather: Clear

File Name : SBCWAHOAM REDO
 Site Code : 05117141
 Start Date : 3/8/2017
 Page No : 1

Groups Printed- 4+ Axle Trucks

Start Time	Waterman Avenue Southbound				Hospitality Lane Westbound				Waterman Avenue Northbound				Hospitality Lane Eastbound						
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
07:00 AM	1	1	0	0	2	0	0	1	0	1	1	3	0	0	4	0	0	0	7
07:15 AM	1	3	0	0	4	0	0	0	0	0	0	1	1	0	2	0	0	0	6
07:30 AM	2	2	0	0	4	2	0	0	0	2	4	0	0	0	4	0	0	0	10
07:45 AM	1	4	0	0	5	2	0	0	0	2	0	2	0	0	2	0	0	0	9
Total	5	10	0	0	15	4	0	1	0	5	1	10	1	0	12	0	0	0	32
08:00 AM	2	3	0	0	5	2	0	0	0	2	1	2	0	0	3	0	0	0	10
08:15 AM	1	3	0	0	4	1	1	0	0	2	0	4	2	0	6	0	0	0	12
08:30 AM	1	2	0	0	3	0	0	2	0	2	1	2	3	0	6	0	1	1	12
08:45 AM	0	0	1	1	1	5	0	0	0	5	0	4	1	1	5	0	0	1	15
Total	4	8	1	1	13	8	1	2	0	11	2	12	6	1	20	0	0	2	46
Grand Total	9	18	1	1	28	12	1	3	0	16	3	22	7	1	32	0	0	2	82
Approch %	32.1	64.3	3.6			75	6.2	18.8			9.4	68.8	21.9			0	0	100	
Total %	11.5	23.1	1.3		35.9	15.4	1.3	3.8		20.5	3.8	28.2	9		41	0	0	2.6	4.9
																			95.1

Start Time	Waterman Avenue Southbound				Hospitality Lane Westbound				Waterman Avenue Northbound				Hospitality Lane Eastbound						
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
07:30 AM	2	2	0	0	4	2	0	0	0	2	0	4	0	0	4	0	0	0	10
07:45 AM	1	4	0	0	5	2	0	0	0	2	0	2	0	0	2	0	0	0	9
08:00 AM	2	3	0	0	5	2	0	0	0	2	1	2	0	0	3	0	0	0	10
08:15 AM	1	3	0	0	4	1	1	0	0	2	0	4	2	0	6	0	0	0	12
Total Volume	6	12	0	0	18	7	1	0	0	8	1	12	2	0	15	0	0	0	41
% App. Total	33.3	66.7	0			87.5	12.5	0			6.7	80	13.3			0	0	0	
PHF	.750	.750	.000		.900	.875	.250	.000		1.00	.250	.750	.250		.625	.000	.000		.854

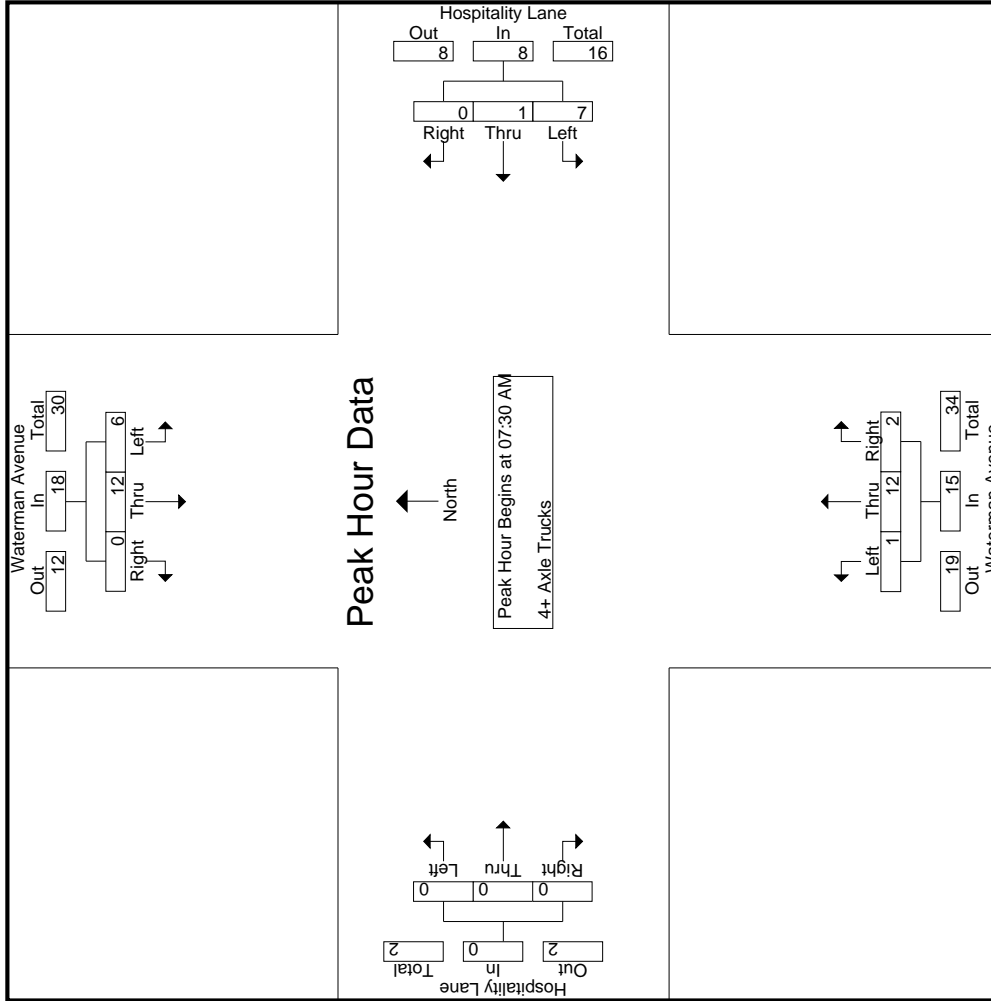
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:30 AM

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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane
 Weather: Clear

File Name : SBCWAHOAM REDO
 Site Code : 05117141
 Start Date : 3/8/2017
 Page No : 2



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File Name : SBCWAHOAM REDO
 Site Code : 05117141
 Start Date : 3/8/2017
 Page No : 3

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane
 Weather: Clear

Start Time	Waterman Avenue Southbound			Hospitality Lane Westbound			Waterman Avenue Northbound			Hospitality Lane Eastbound				
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total	
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	07:30 AM													
+0 mins.	2	2	0	4	2	0	0	2	0	4	0	0	0	0
+15 mins.	1	4	0	5	2	0	0	2	0	2	0	0	0	0
+30 mins.	2	3	0	5	2	0	0	2	1	3	0	0	0	0
+45 mins.	1	3	0	4	1	1	0	2	0	6	0	0	0	0
Total Volume	6	12	0	18	7	1	0	8	1	12	2	15	0	0
% App. Total	33.3	66.7	0		87.5	12.5	0		6.7	80	13.3		0	0
PHF	.750	.750	.000	.900	.875	.250	.000	1.000	.250	.750	.250	.625	.000	.000

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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane
 Weather: Clear

File Name : 11-SBCWTHOPM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	Waterman Avenue Southbound					Hospitality Lane Westbound					Waterman Avenue Northbound					Hospitality Lane Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	38	210	41	18	289	97	95	14	1	206	41	107	200	77	348	36	57	118	43	211	139	1054	1193
04:15 PM	50	208	34	10	292	117	108	27	3	252	70	105	168	81	343	32	49	101	28	182	122	1069	1191
04:30 PM	43	243	37	14	323	83	98	25	3	206	61	122	180	85	363	40	83	133	30	256	132	1148	1280
04:45 PM	47	176	28	15	251	100	109	33	9	242	71	99	164	106	334	34	79	130	50	243	180	1070	1250
Total	178	837	140	57	1155	397	410	99	16	906	243	433	712	349	1388	142	268	482	151	892	573	4341	4914
05:00 PM	52	287	38	20	377	99	120	12	1	231	66	95	166	90	327	49	87	173	29	309	140	1244	1384
05:15 PM	49	241	45	17	335	100	115	31	1	246	64	108	167	63	339	45	119	118	14	282	95	1202	1297
05:30 PM	52	221	39	18	312	96	102	27	6	225	29	125	179	81	333	48	91	96	17	235	122	1105	1227
05:45 PM	51	177	37	18	265	65	86	32	7	183	48	130	156	58	334	21	64	69	27	154	110	936	1046
Total	204	926	159	73	1289	360	423	102	15	885	207	458	668	292	1333	163	361	456	87	980	467	4487	4954
Grand Total	382	1763	299	130	2444	757	833	201	31	1791	450	891	1380	641	2721	305	629	938	238	1872	1040	8828	9868
Approach %	15.6	72.1	12.2		42.3	46.5	11.2			20.3	16.5	32.7	50.7		30.8	3.5	7.1	10.6		21.2	10.5	89.5	
Total %	4.3	20	3.4		27.7	8.6	9.4	2.3		20.3	5.1	10.1	15.6		30.8	3.5	7.1	10.6		21.2	10.5	89.5	
Passenger Vehicles	372	1726	296		2524	747	818	198		1793	447	853	1371		3308	304	610	937		2088	0	0	9713
% Passenger Vehicles	97.4	97.9	99	100	98.1	98.7	98.2	98.5	96.8	98.4	99.3	95.7	99.3	99.4	98.4	99.7	97	99.9	99.6	99	0	0	98.4
Large 2 Axle Vehicles	3	19	3		25	4	7	1		12	2	16	4		24	1	8	0		9	0	0	70
% Large 2 Axle Vehicles	0.8	1.1	1	0	1	0.5	0.8	0.5	0	0.7	0.4	1.8	0.3	0.3	0.7	0.3	1.3	0	0	0.4	0	0	0.7
3 Axle Vehicles	2	3	0		5	0	8	1		9	1	1	1		3	0	10	1		12	0	0	29
% 3 Axle Vehicles	0.5	0.2	0	0	0.2	0	1	0.5	0	0.5	0.2	0.1	0.1	0	0.1	0	1.6	0.1	0.4	0.6	0	0	0.3
4+ Axle Trucks	5	15	0		20	6	0	1		8	0	21	4		27	0	1	0		1	0	0	56
% 4+ Axle Trucks	1.3	0.9	0	0	0.8	0.8	0	0.5	3.2	0.4	0	2.4	0.3	0.3	0.8	0	0.2	0	0	0	0	0	0.6

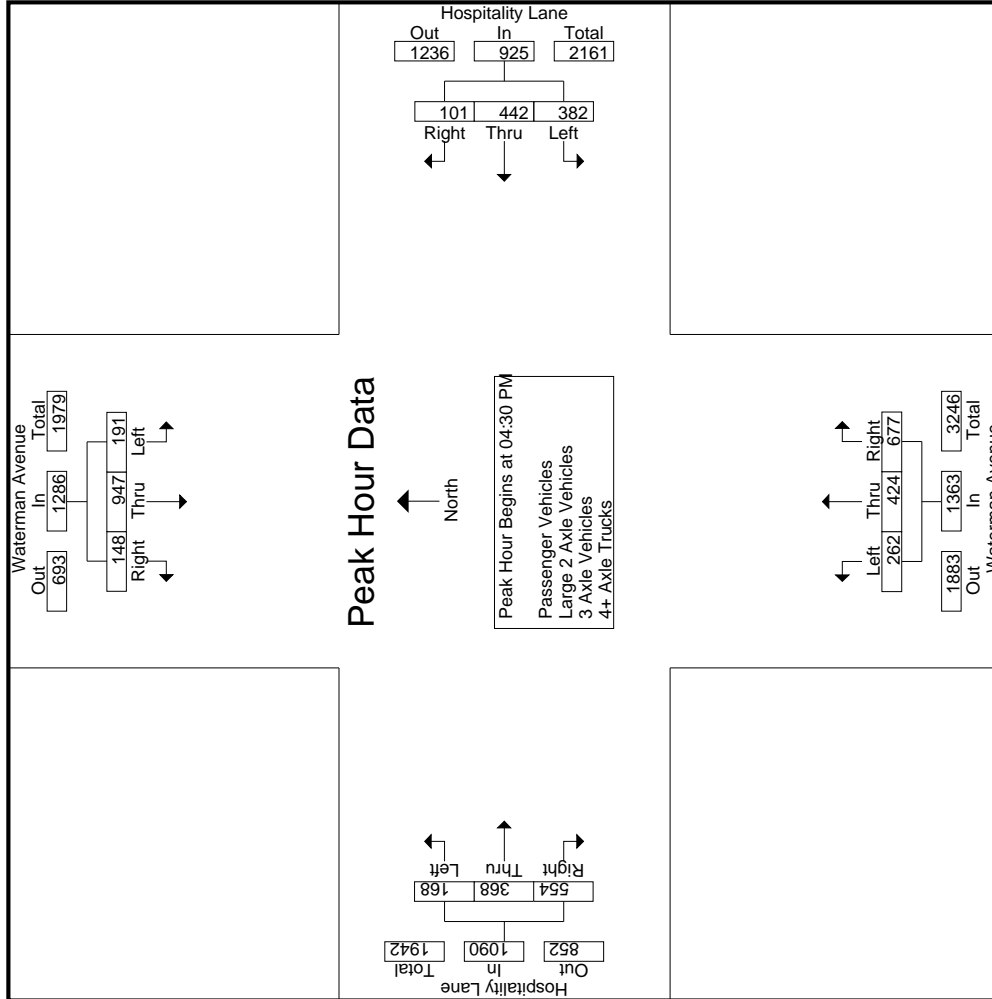
Start Time	Waterman Avenue Southbound					Hospitality Lane Westbound					Waterman Avenue Northbound					Hospitality Lane Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:30 PM	43	243	37		323	83	98	25		206	61	122	180		363	40	83	133		256			1148
04:45 PM	47	176	28		251	100	109	33		242	71	99	164		334	34	79	130		243			1070
05:00 PM	52	287	38		377	99	120	12		231	66	95	166		327	49	87	173		309			1244
05:15 PM	49	241	45		312	96	102	31		246	29	125	179		333	48	91	96		235			1227
Total Volume	191	947	148		1286	382	442	101		925	262	424	677		1363	168	368	554		1090			4664
% App. Total	14.9	73.6	11.5		41.3	47.8	10.9			19.2	31.1	49.7			15.4	33.8	50.8			33.8			882
PHF	.918	.825	.822		.853	.955	.921	.765		.940	.923	.869	.940		.939	.857	.773	.801		.882			.937

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:30 PM

Counts Unlimited, Inc.
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 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane
 Weather: Clear

File Name : 11-SBCWTHOPM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 2



Counts Unlimited, Inc.
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 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane
 Weather: Clear

File Name : 11-SBCWTHOPM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 3

Start Time	Waterman Avenue Southbound			Hospitality Lane Westbound			Waterman Avenue Northbound			Hospitality Lane Eastbound						
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right				
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																
Peak Hour for Each Approach Begins at:																
	05:00 PM			04:45 PM			04:00 PM			04:30 PM						
+0 mins.	52	287	38	377	100	109	33	242	41	107	200	348	40	83	133	256
+15 mins.	49	241	45	335	99	120	12	231	70	105	168	343	34	79	130	243
+30 mins.	52	221	39	312	100	115	31	246	61	122	180	363	49	87	173	309
+45 mins.	51	177	37	265	96	102	27	225	71	99	164	334	45	119	118	282
Total Volume	204	926	159	1289	395	446	103	944	243	433	712	1388	168	368	554	1090
% App. Total	15.8	71.8	12.3		41.8	47.2	10.9		17.5	31.2	51.3		15.4	33.8	50.8	
PHF	.981	.807	.883	.855	.988	.929	.780	.959	.856	.887	.890	.956	.857	.773	.801	.882

Counts Unlimited, Inc.
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane
 Weather: Clear

File Name : 11-SBCWTHOPM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 1

Groups Printed- Passenger Vehicles

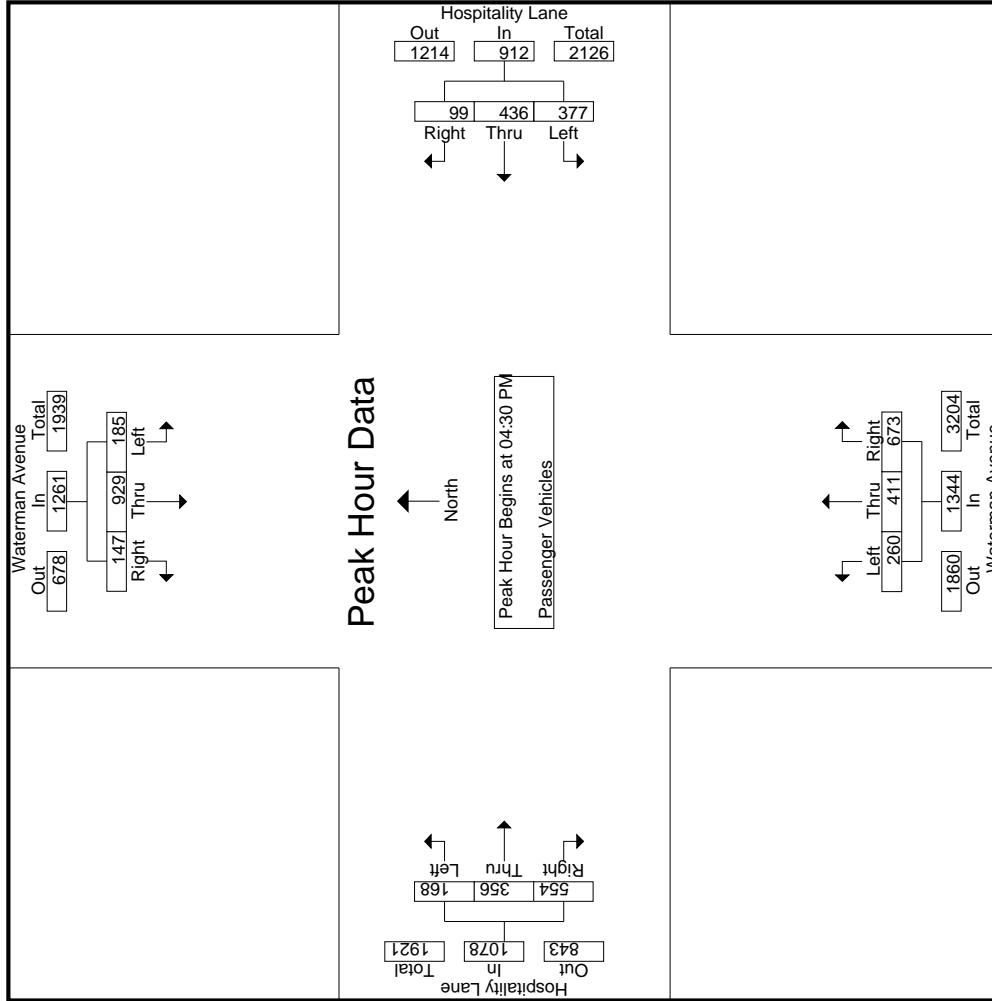
Start Time	Waterman Avenue Southbound					Hospitality Lane Westbound					Waterman Avenue Northbound					Hospitality Lane Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	37	203	40	18	280	96	93	13	1	202	40	99	199	77	338	36	55	118	43	209	139	1029	1168
04:15 PM	48	205	34	10	287	116	105	27	3	248	70	99	165	79	334	32	47	101	28	180	120	1049	1169
04:30 PM	43	237	37	14	317	83	97	24	3	204	61	119	178	84	358	40	79	133	30	252	131	1131	1262
04:45 PM	45	171	27	15	243	98	108	32	8	238	71	94	163	105	328	34	78	130	50	242	178	1051	1229
Total	173	816	138	57	1127	393	403	96	15	892	242	411	705	345	1358	142	259	482	151	883	568	4260	4828
05:00 PM	50	285	38	20	373	98	118	12	1	228	64	93	166	90	323	49	83	173	29	305	140	1229	1369
05:15 PM	47	236	45	17	328	98	113	31	1	242	64	105	166	63	335	45	116	118	14	279	95	1184	1279
05:30 PM	52	216	39	18	307	94	101	27	6	222	29	122	179	81	330	47	89	95	16	231	121	1090	1211
05:45 PM	50	173	36	18	259	64	83	32	7	179	48	122	155	58	325	21	63	69	27	153	110	916	1026
Total	199	910	158	73	1267	354	415	102	15	871	205	442	666	292	1313	162	351	455	86	968	466	4419	4885
Grand Total	372	1726	296	130	2394	747	818	198	30	1763	447	853	1371	637	2671	304	610	937	237	1851	1034	8679	9713
Approach %	15.5	72.1	12.4		27.6	42.4	46.4	11.2		20.3	16.7	31.9	51.3		30.8	16.4	33	50.6		21.3	10.6	89.4	
Total %	4.3	19.9	3.4			8.6	9.4	2.3			5.2	9.8	15.8			3.5	7	10.8					

Start Time	Waterman Avenue Southbound					Hospitality Lane Westbound					Waterman Avenue Northbound					Hospitality Lane Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:30 PM	43	237	37		317	83	97	24		204	61	119	178		358	40	79	133		252			1131
04:45 PM	45	171	27		243	98	108	32		238	71	94	163		328	34	78	130		242			1051
05:00 PM	50	285	38		373	98	118	12		228	64	93	166		323	49	83	173		305			1229
05:15 PM	47	236	45		328	98	113	31		242	64	105	166		335	45	116	118		279			1184
Total Volume	185	929	147		1261	377	436	99		912	260	411	673		1344	168	366	554		1078			4595
% App. Total	14.7	73.7	11.7		11.7	41.3	47.8	10.9		10.9	19.3	30.6	50.1		50.1	15.6	33	51.4		33			935
PHF	.925	.815	.817		.845	.962	.924	.773		.942	.915	.863	.945		.939	.857	.767	.801		.884			

Counts Unlimited, Inc.
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane
 Weather: Clear

File Name : 11-SBCWTHOPM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 2



Counts Unlimited, Inc.
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane
 Weather: Clear

File Name : 11-SBCWTHOPM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 3

Start Time	Waterman Avenue Southbound				Hospitality Lane Westbound				Waterman Avenue Northbound				Hospitality Lane Eastbound			
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																
Peak Hour for Each Approach Begins at:																
	04:30 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	43	237	37	317	83	97	24	204	61	119	178	358	40	79	133	252
+15 mins.	45	171	27	243	98	108	32	238	71	94	163	328	34	78	130	242
+30 mins.	50	285	38	373	98	118	12	228	64	93	166	323	49	83	173	305
+45 mins.	47	236	45	328	98	113	31	242	64	105	166	335	45	116	118	279
Total Volume	185	929	147	1261	377	436	99	912	260	411	673	1344	168	356	554	1078
% App. Total	14.7	73.7	11.7	84.5	41.3	47.8	10.9	94.2	19.3	30.6	50.1	93.9	15.6	33	51.4	88.4
PHF	.925	.815	.817	.845	.962	.924	.773	.942	.915	.863	.945	.939	.857	.767	.801	.884

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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane
 Weather: Clear

File Name : 11-SBCWTHOPM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 1

Groups Printed- Large 2 Axle Vehicles

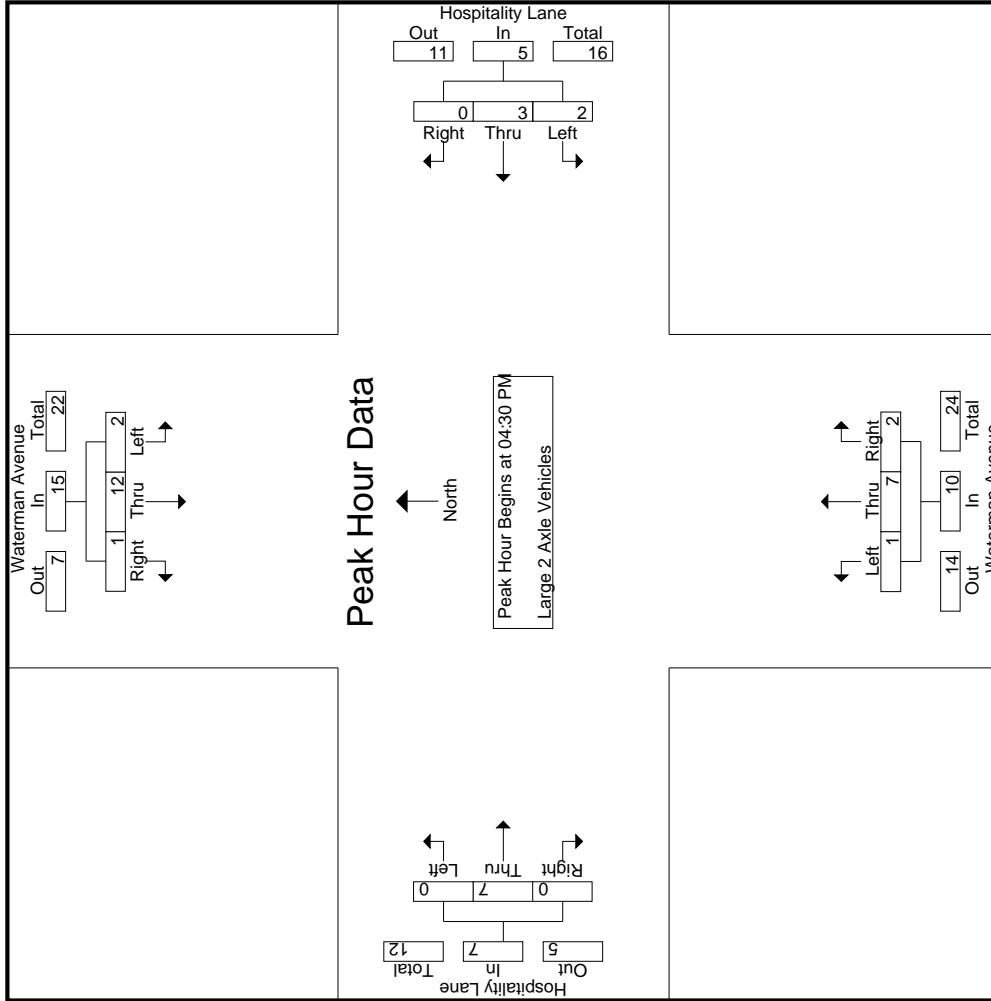
Start Time	Waterman Avenue Southbound					Hospitality Lane Westbound					Waterman Avenue Northbound					Hospitality Lane Eastbound								
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
04:00 PM	1	3	1	0	5	0	2	1	0	3	1	2	0	0	3	0	0	0	0	0	0	0	11	11
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	2	2	1	4	0	1	0	0	1	1	5	6	
04:30 PM	0	4	0	0	4	0	1	0	0	1	0	2	1	0	3	0	2	0	0	2	0	10	10	
04:45 PM	1	2	1	0	4	0	0	0	0	0	0	3	1	1	4	0	0	0	0	1	1	8	9	
Total	2	9	2	0	13	0	3	1	0	4	1	9	4	2	14	0	3	0	0	3	2	34	36	
05:00 PM	0	2	0	0	2	0	1	0	0	1	1	0	0	0	1	0	2	0	0	2	0	6	6	
05:15 PM	1	4	0	0	5	2	1	0	0	3	0	2	0	0	2	0	3	0	0	3	0	13	13	
05:30 PM	0	2	0	0	2	1	0	0	0	1	0	2	0	0	2	1	0	0	0	1	0	6	6	
05:45 PM	0	2	1	0	3	1	2	0	0	3	0	3	0	0	3	0	0	0	0	0	0	9	9	
Total	1	10	1	0	12	4	4	0	0	8	1	7	0	0	8	1	5	0	0	6	0	34	34	
Grand Total	3	19	3	0	25	4	7	1	0	12	2	16	4	2	22	1	8	0	0	9	2	68	70	
Approch %	12	76	12		33.3	58.3	8.3			17.6	9.1	72.7	18.2		32.4	11.1	88.9	0		13.2	2.9	97.1		
Total %	4.4	27.9	4.4		36.8	5.9	10.3	1.5			2.9	23.5	5.9			1.5	11.8	0			2.9	97.1		

Start Time	Waterman Avenue Southbound					Hospitality Lane Westbound					Waterman Avenue Northbound					Hospitality Lane Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:30 PM	0	4	0	0	4	0	1	0	0	1	0	2	1	0	3	0	2	0	0	0	0	2	10
04:45 PM	1	2	1	0	4	0	0	0	0	0	0	3	1	0	4	0	0	0	0	0	0	0	8
05:00 PM	0	2	0	0	2	0	1	0	0	1	1	0	0	0	2	0	2	0	0	2	0	2	6
05:15 PM	1	4	0	0	5	2	1	0	0	3	0	2	0	0	2	0	3	0	0	3	0	3	13
Total Volume	2	12	1	0	15	2	3	0	0	5	1	7	2	0	10	0	7	0	0	7	0	7	37
% App. Total	13.3	80	6.7		6.7	40	60	0		20	10	70	20		100	0	100	0		100	0	100	7.12
PHF	.500	.750	.250		.750	.250	.750	.000		.417	.250	.583	.500		.625	.000	.583	.000		.583	.000	.583	.712

Counts Unlimited, Inc.
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane
 Weather: Clear

File Name : 11-SBCWTHOPM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 2



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 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane
 Weather: Clear

File Name : 11-SBCWTHOPM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 3

Start Time	Waterman Avenue Southbound			Hospitality Lane Westbound			Waterman Avenue Northbound			Hospitality Lane Eastbound				
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	04:30 PM													
+0 mins.	0	4	0	0	1	0	0	1	2	1	3	0	2	2
+15 mins.	1	2	1	0	0	0	0	0	3	1	4	0	0	0
+30 mins.	0	2	0	0	1	0	1	1	0	0	1	0	2	2
+45 mins.	1	4	0	0	1	0	3	0	2	0	2	0	3	3
Total Volume	2	12	1	2	3	0	5	1	7	2	10	0	7	7
% App. Total	13.3	80	6.7	40	60	0	10	10	70	20	62.5	0	100	0
PHF	.500	.750	.250	.250	.750	.000	.417	.250	.583	.500	.625	.000	.583	.000

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 PO Box 1178
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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane
 Weather: Clear

File Name : 11-SBCWTHOPM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 1

Groups Printed- 3 Axle Vehicles

Start Time	Waterman Avenue Southbound				Hospitality Lane Westbound				Waterman Avenue Northbound				Hospitality Lane Eastbound			
	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR
04:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0
04:15 PM	0	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	2	0	0
04:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0
Total	0	2	0	0	4	1	0	0	0	1	0	0	0	5	0	0
05:00 PM	1	0	0	0	1	0	0	0	1	0	0	0	0	2	0	0
05:15 PM	1	1	0	0	1	0	0	0	1	0	1	0	0	0	0	0
05:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	2	1	1	3
05:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0
Total	2	1	0	0	4	0	0	0	1	0	1	0	0	5	1	1
Grand Total	2	3	0	0	9	1	1	0	3	0	10	1	1	11	1	28
Approach %	40	60	0	0	88.9	11.1	0	0	33.3	33.3	33.3	9.1	0	90.9	3.4	96.6
Total %	7.1	10.7	0	0	28.6	3.6	3.6	10.7	35.7	35.7	3.6	3.6	0	35.7	3.6	39.3

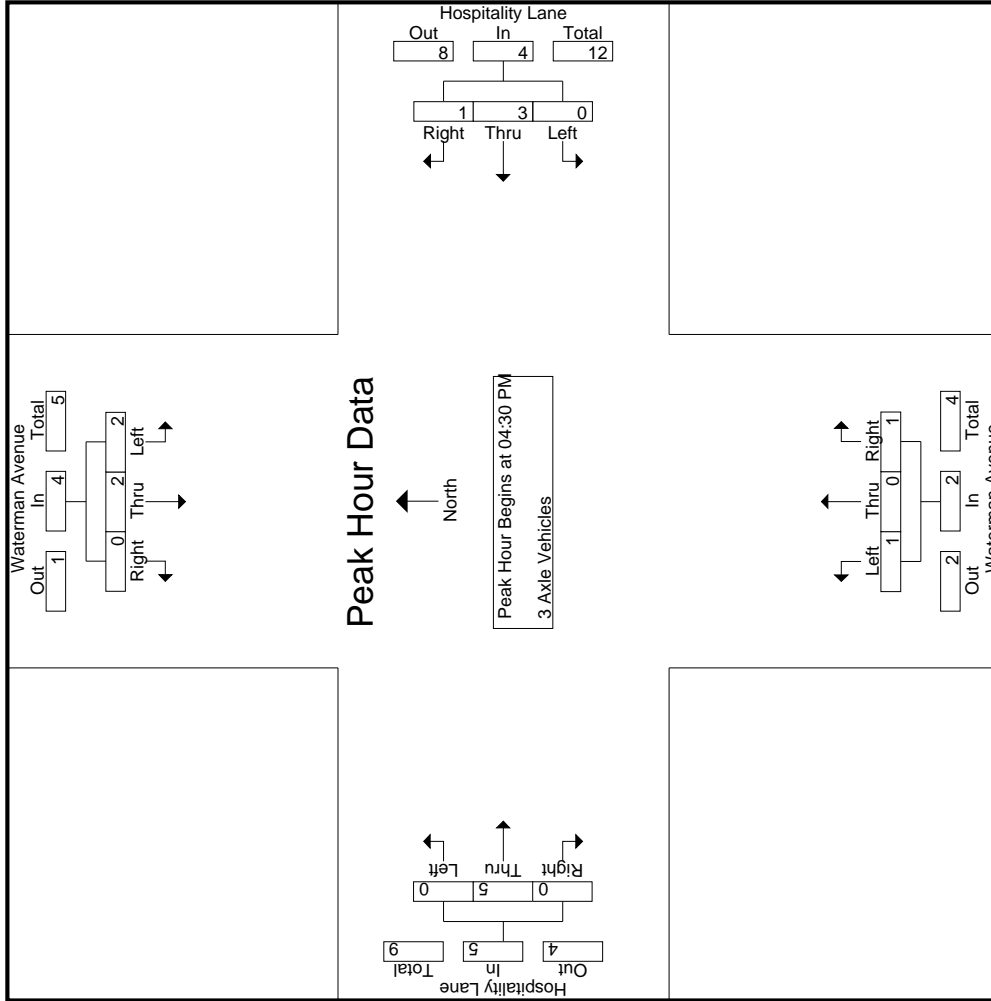
3.1-335

Start Time	Waterman Avenue Southbound				Hospitality Lane Westbound				Waterman Avenue Northbound				Hospitality Lane Eastbound			
	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR
04:30 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
05:15 PM	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	2	2	0	0	0	3	1	0	4	1	0	0	0	5	0	0
% App. Total	50	50	0	0	75	25	0	0	100	50	50	0	0	100	0	0
PHF	.500	.500	.000	.000	.750	.250	.000	.000	1.000	.250	.000	.000	.000	.625	.000	.625
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																
Peak Hour for Entire Intersection Begins at 04:30 PM																
Total Volume	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	0
% App. Total	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	0
PHF	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	0
Total Volume	2	2	0	0	0	3	1	0	4	1	0	0	0	5	0	0
% App. Total	50	50	0	0	75	25	0	0	100	50	50	0	0	100	0	0
PHF	.500	.500	.000	.000	.750	.250	.000	.000	1.000	.250	.000	.000	.000	.625	.000	.625

Counts Unlimited, Inc.
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane
 Weather: Clear

File Name : 11-SBCWTHOPM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 2



Counts Unlimited, Inc.
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane
 Weather: Clear

File Name : 11-SBCWTHOPM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 3

Start Time	Waterman Avenue Southbound			Hospitality Lane Westbound			Waterman Avenue Northbound			Hospitality Lane Eastbound		
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1												
Peak Hour for Each Approach Begins at:												
	04:30 PM				04:30 PM				04:30 PM			
+0 mins.	0	1	0	1	0	0	1	1	0	0	0	0
+15 mins.	0	0	0	0	1	0	0	1	0	0	0	0
+30 mins.	1	0	0	1	0	0	1	1	0	0	0	1
+45 mins.	1	1	0	2	0	1	0	1	0	0	0	0
Total Volume	2	2	0	4	0	3	1	4	1	0	1	2
% App. Total	50	50	0	0	75	25	50	50	50	0	50	100
PHF	.500	.500	.000	.500	.000	.750	.250	1.000	.250	.000	.250	.625
												.000
												.625

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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane
 Weather: Clear

File Name : 11-SBCWTHOPM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 1

Groups Printed- 4+ Axle Trucks

Start Time	Waterman Avenue Southbound				Hospitality Lane Westbound				Waterman Avenue Northbound				Hospitality Lane Eastbound						
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
04:00 PM	0	4	0	0	4	1	0	0	0	1	0	5	1	0	6	0	0	0	11
04:15 PM	2	2	0	0	4	1	0	0	0	1	0	4	1	1	5	1	1	1	12
04:30 PM	0	1	0	0	1	0	0	0	0	0	0	1	1	1	2	0	0	0	4
04:45 PM	1	3	0	0	4	2	0	1	1	3	0	2	0	0	2	0	0	1	10
Total	3	10	0	0	13	4	0	1	1	5	0	12	3	2	15	0	1	3	37
05:00 PM	1	0	0	0	1	1	0	0	0	1	0	2	0	0	2	0	0	0	4
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1
05:30 PM	0	3	0	0	3	1	0	0	0	1	0	1	0	0	1	0	0	0	5
05:45 PM	1	2	0	0	3	0	0	0	0	0	5	1	0	6	0	0	0	9	
Total	2	5	0	0	7	2	0	0	0	2	0	9	1	0	10	0	0	19	
Grand Total	5	15	0	0	20	6	0	1	1	7	0	21	4	2	25	0	1	3	56
Approach %	25	75	0	0	85.7	0	14.3	0	0	13.2	0	84	16	0	47.2	0	100	5.4	94.6
Total %	9.4	28.3	0	0	37.7	0	1.9	0	0	13.2	0	39.6	7.5	0	47.2	0	1.9	5.4	94.6

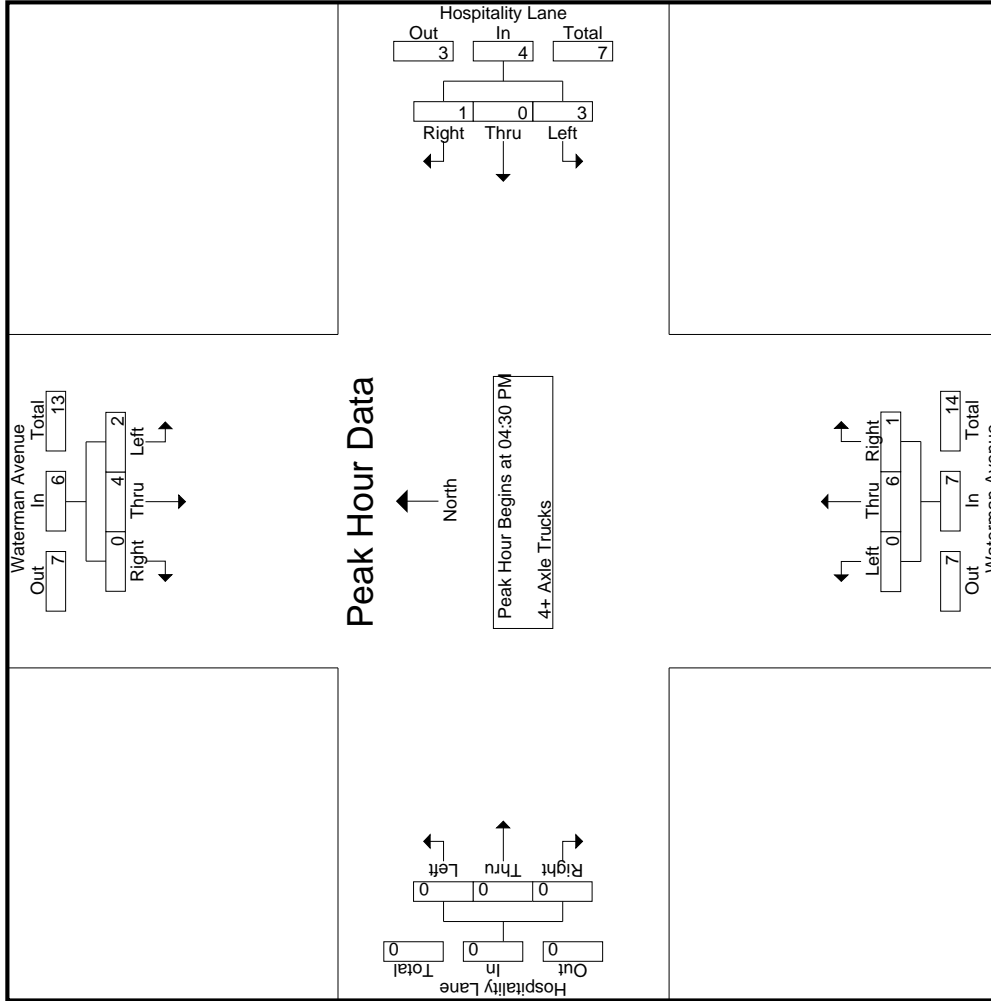
Start Time	Waterman Avenue Southbound				Hospitality Lane Westbound				Waterman Avenue Northbound				Hospitality Lane Eastbound						
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
04:30 PM	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	3
04:45 PM	1	3	0	0	4	2	0	0	0	1	0	2	0	0	2	0	0	0	9
05:00 PM	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	4
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1
Total Volume	2	4	0	0	6	3	0	0	0	1	4	0	6	1	7	0	0	0	17
% App. Total	33.3	66.7	0	0	100	75	0	25	0	85.7	14.3	0	85.7	14.3	100	0	0	0	100
PHF	.500	.333	.000	.000	.375	.375	.000	.250	.000	.750	.333	.000	.750	.250	.875	.000	.000	.000	.472

Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:30 PM

Counts Unlimited, Inc.
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane
 Weather: Clear

File Name : 11-SBCWTHOPM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 2



Counts Unlimited, Inc.
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

File Name : 11-SBCWTHOPM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 3

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane
 Weather: Clear

Start Time	Waterman Avenue Southbound			Hospitality Lane Westbound			Waterman Avenue Northbound			Hospitality Lane Eastbound				
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	04:30 PM													
+0 mins.	0	1	0	0	0	0	0	0	1	0	0	0	2	0
+15 mins.	1	3	0	2	0	1	0	2	0	0	0	0	2	0
+30 mins.	1	0	0	1	0	0	0	2	0	0	0	0	2	0
+45 mins.	0	0	0	0	0	0	0	1	0	0	0	0	1	0
Total Volume	2	4	0	3	0	1	0	6	1	0	0	0	7	0
% App. Total	33.3	66.7	0	75	0	25	0	85.7	14.3	0	0	0	0	0
PHF	.500	.333	.000	.375	.000	.250	.000	.750	.250	.000	.000	.000	.875	.000

Location: San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane



Date: 3/14/2017
 Day: Tuesday

PEDESTRIANS

	North Leg Waterman Avenue	East Leg Hospitality Lane	South Leg Waterman Avenue	West Leg Hospitality Lane	TOTAL
7:00 AM	0	1	2	0	3
7:15 AM	3	0	0	2	5
7:30 AM	5	0	0	1	6
7:45 AM	4	1	0	1	6
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	1	1
8:30 AM	2	0	0	3	5
8:45 AM	2	3	0	1	6
TOTAL VOLUMES:	16	5	2	9	32

	North Leg Waterman Avenue	East Leg Hospitality Lane	South Leg Waterman Avenue	West Leg Hospitality Lane	TOTAL
4:00 PM	7	1	0	3	11
4:15 PM	4	1	0	0	5
4:30 PM	1	0	0	1	2
4:45 PM	0	0	0	3	3
5:00 PM	1	0	0	2	3
5:15 PM	5	5	0	7	17
5:30 PM	4	0	0	1	5
5:45 PM	0	3	0	0	3
TOTAL VOLUMES:	22	10	0	17	49

Location: San Bernardino
 N/S: Waterman Avenue
 E/W: Hospitality Lane



Date: 3/14/2017
 Day: Tuesday

BICYCLES

	North Leg Waterman Avenue	East Leg Hospitality Lane	South Leg Waterman Avenue	West Leg Hospitality Lane	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	1	0	0	1
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	2	2	0	0	4
8:30 AM	0	0	0	0	0
8:45 AM	0	0	1	0	1
TOTAL VOLUMES:	2	3	1	0	6

	North Leg Waterman Avenue	East Leg Hospitality Lane	South Leg Waterman Avenue	West Leg Hospitality Lane	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	2	1	0	1	4
TOTAL VOLUMES:	2	1	0	1	4

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Westbound On Ramp
 Weather: Clear

File Name : 12-SBCWT10WAM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

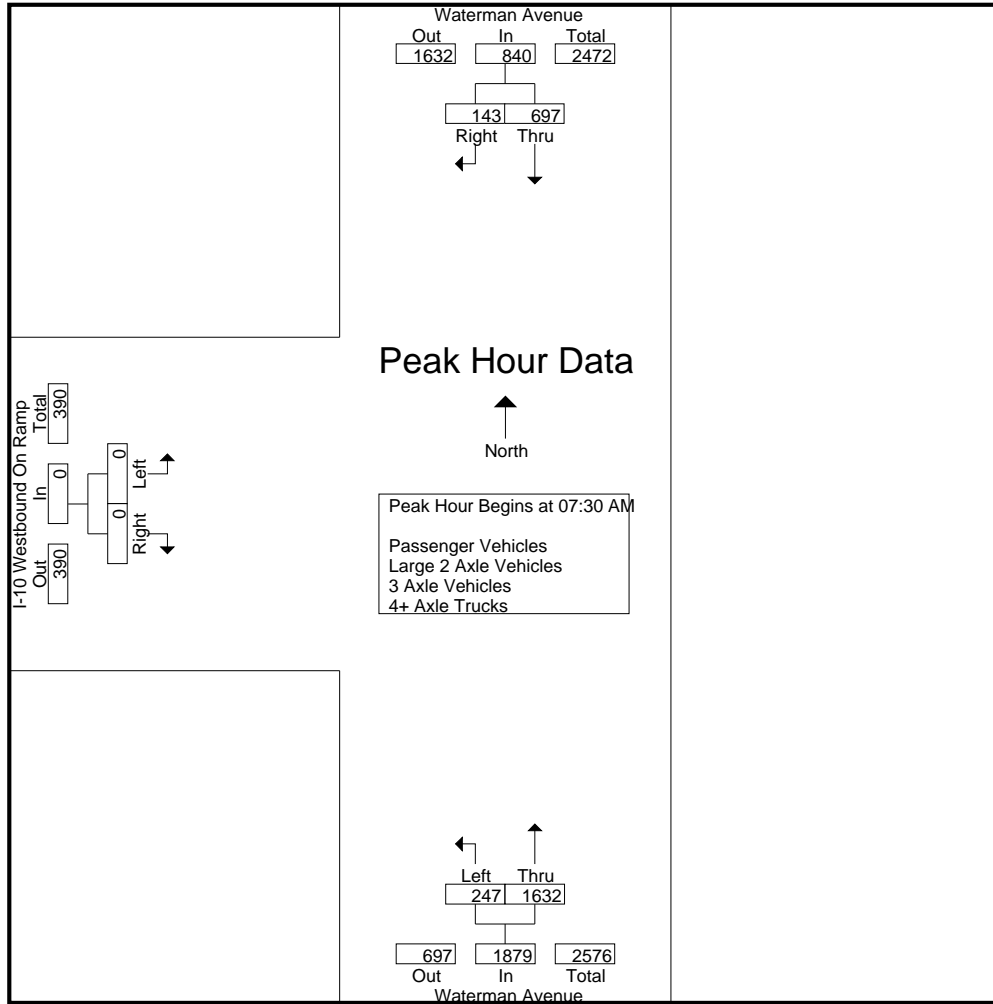
Start Time	Waterman Avenue Southbound			Waterman Avenue Northbound			I-10 Westbound On Ramp Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
07:00 AM	116	26	142	56	331	387	0	0	0	529
07:15 AM	131	26	157	61	387	448	0	0	0	605
07:30 AM	160	30	190	45	399	444	0	0	0	634
07:45 AM	175	26	201	75	436	511	0	0	0	712
Total	582	108	690	237	1553	1790	0	0	0	2480
08:00 AM	168	43	211	59	414	473	0	0	0	684
08:15 AM	194	44	238	68	383	451	0	0	0	689
08:30 AM	133	56	189	68	369	437	0	0	0	626
08:45 AM	152	34	186	71	395	466	0	0	0	652
Total	647	177	824	266	1561	1827	0	0	0	2651
Grand Total	1229	285	1514	503	3114	3617	0	0	0	5131
Apprch %	81.2	18.8		13.9	86.1		0	0		
Total %	24	5.6	29.5	9.8	60.7	70.5	0	0	0	
Passenger Vehicles	1155	258	1413	460	3018	3478	0	0	0	4891
% Passenger Vehicles	94	90.5	93.3	91.5	96.9	96.2	0	0	0	95.3
Large 2 Axle Vehicles	56	14	70	11	58	69	0	0	0	139
% Large 2 Axle Vehicles	4.6	4.9	4.6	2.2	1.9	1.9	0	0	0	2.7
3 Axle Vehicles	6	3	9	5	9	14	0	0	0	23
% 3 Axle Vehicles	0.5	1.1	0.6	1	0.3	0.4	0	0	0	0.4
4+ Axle Trucks	12	10	22	27	29	56	0	0	0	78
% 4+ Axle Trucks	1	3.5	1.5	5.4	0.9	1.5	0	0	0	1.5

Start Time	Waterman Avenue Southbound			Waterman Avenue Northbound			I-10 Westbound On Ramp Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
07:30 AM	160	30	190	45	399	444	0	0	0	634
07:45 AM	175	26	201	75	436	511	0	0	0	712
08:00 AM	168	43	211	59	414	473	0	0	0	684
08:15 AM	194	44	238	68	383	451	0	0	0	689
Total Volume	697	143	840	247	1632	1879	0	0	0	2719
% App. Total	83	17		13.1	86.9		0	0		
PHF	.898	.813	.882	.823	.936	.919	.000	.000	.000	.955

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:30 AM

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Westbound On Ramp
 Weather: Clear

File Name : 12-SBCWT10WAM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:30 AM			07:30 AM			07:00 AM		
+0 mins.	160	30	190	45	399	444	0	0	0
+15 mins.	175	26	201	75	436	511	0	0	0
+30 mins.	168	43	211	59	414	473	0	0	0
+45 mins.	194	44	238	68	383	451	0	0	0
Total Volume	697	143	840	247	1632	1879	0	0	0
% App. Total	83	17		13.1	86.9		0	0	
PHF	.898	.813	.882	.823	.936	.919	.000	.000	.000

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Westbound On Ramp
 Weather: Clear

File Name : 12-SBCWT10WAM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 1

Groups Printed- Passenger Vehicles

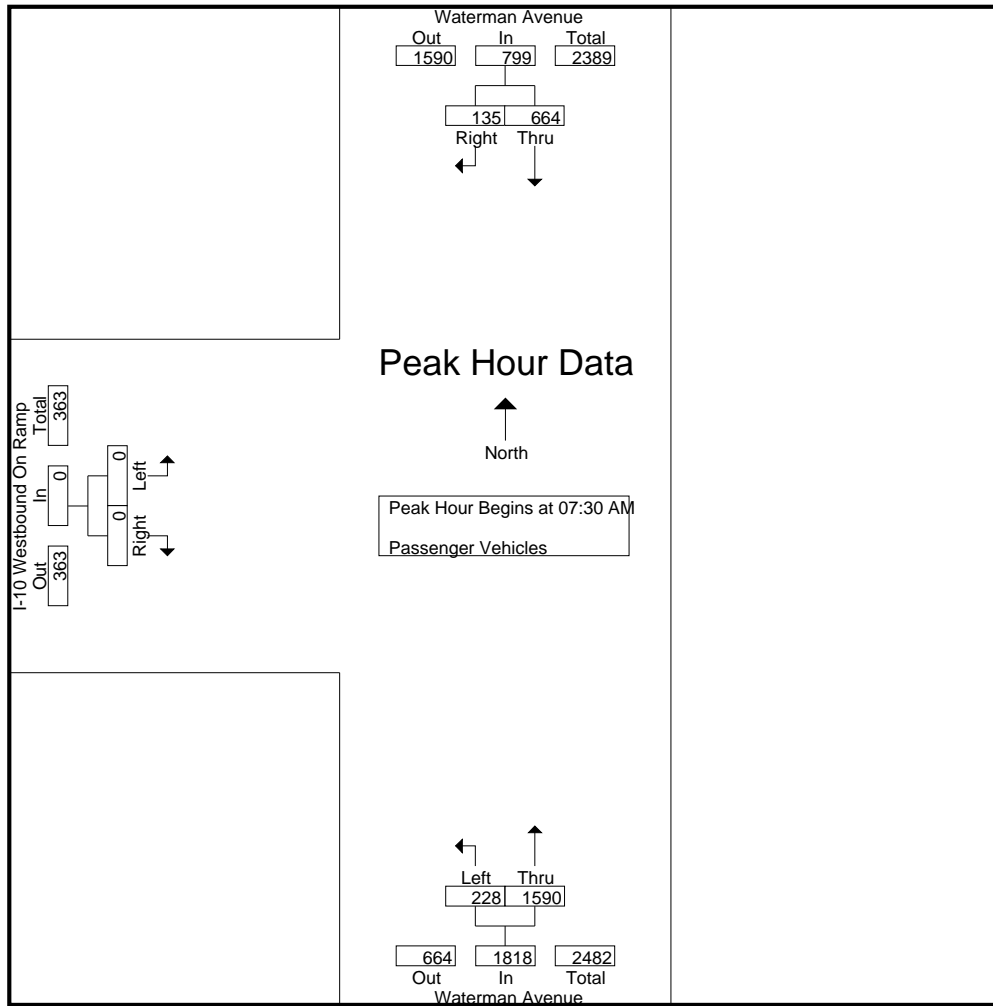
Start Time	Waterman Avenue Southbound			Waterman Avenue Northbound			I-10 Westbound On Ramp Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
07:00 AM	106	22	128	48	322	370	0	0	0	498
07:15 AM	121	19	140	58	377	435	0	0	0	575
07:30 AM	150	29	179	41	387	428	0	0	0	607
07:45 AM	164	26	190	71	427	498	0	0	0	688
Total	541	96	637	218	1513	1731	0	0	0	2368
08:00 AM	162	41	203	56	403	459	0	0	0	662
08:15 AM	188	39	227	60	373	433	0	0	0	660
08:30 AM	120	49	169	62	349	411	0	0	0	580
08:45 AM	144	33	177	64	380	444	0	0	0	621
Total	614	162	776	242	1505	1747	0	0	0	2523
Grand Total	1155	258	1413	460	3018	3478	0	0	0	4891
Apprch %	81.7	18.3		13.2	86.8		0	0		
Total %	23.6	5.3	28.9	9.4	61.7	71.1	0	0	0	

Start Time	Waterman Avenue Southbound			Waterman Avenue Northbound			I-10 Westbound On Ramp Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
07:30 AM	150	29	179	41	387	428	0	0	0	607
07:45 AM	164	26	190	71	427	498	0	0	0	688
08:00 AM	162	41	203	56	403	459	0	0	0	662
08:15 AM	188	39	227	60	373	433	0	0	0	660
Total Volume	664	135	799	228	1590	1818	0	0	0	2617
% App. Total	83.1	16.9		12.5	87.5		0	0		
PHF	.883	.823	.880	.803	.931	.913	.000	.000	.000	.951

Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:30 AM

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Westbound On Ramp
 Weather: Clear

File Name : 12-SBCWT10WAM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 2



Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:30 AM			07:30 AM			07:30 AM		
+0 mins.	150	29	179	41	387	428	0	0	0
+15 mins.	164	26	190	71	427	498	0	0	0
+30 mins.	162	41	203	56	403	459	0	0	0
+45 mins.	188	39	227	60	373	433	0	0	0
Total Volume	664	135	799	228	1590	1818	0	0	0
% App. Total	83.1	16.9		12.5	87.5		0	0	
PHF	.883	.823	.880	.803	.931	.913	.000	.000	.000

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Westbound On Ramp
 Weather: Clear

File Name : 12-SBCWT10WAM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 1

Groups Printed- Large 2 Axle Vehicles

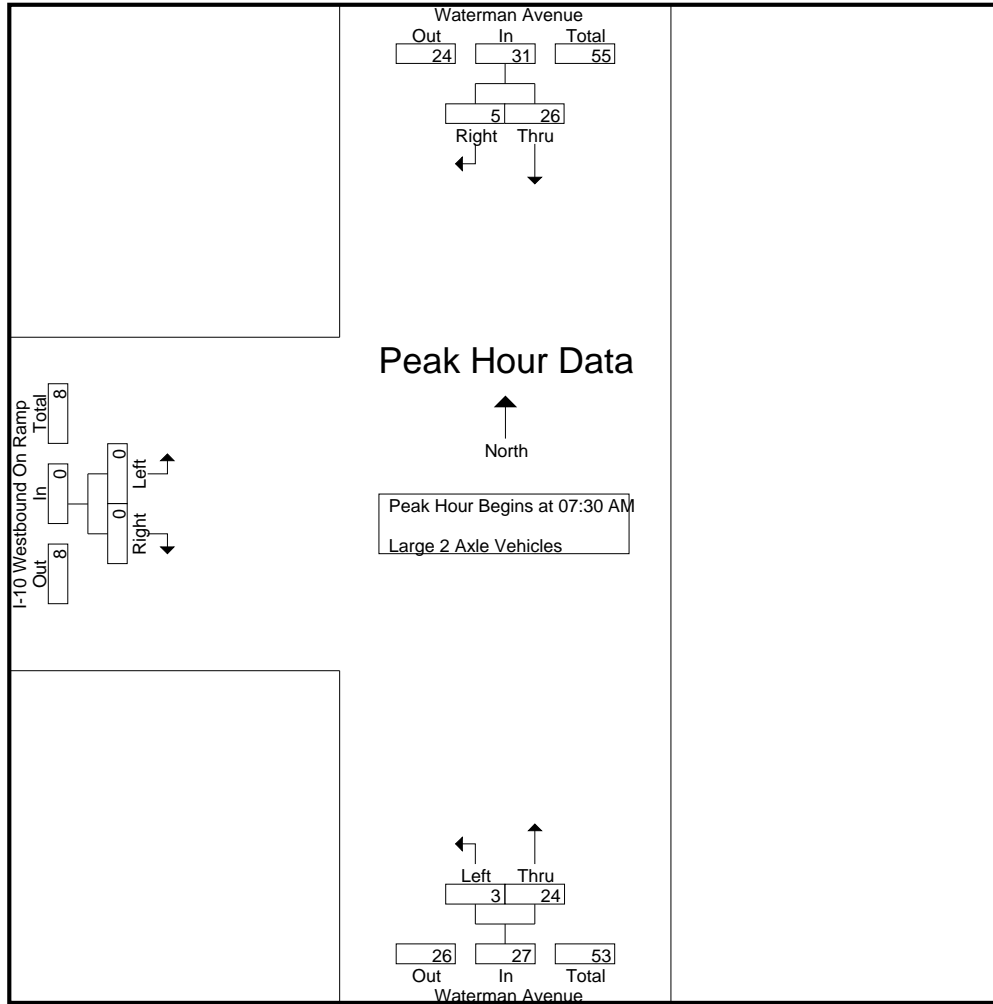
Start Time	Waterman Avenue Southbound			Waterman Avenue Northbound			I-10 Westbound On Ramp Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
07:00 AM	6	0	6	2	8	10	0	0	0	16
07:15 AM	8	4	12	0	4	4	0	0	0	16
07:30 AM	7	0	7	1	7	8	0	0	0	15
07:45 AM	8	0	8	0	7	7	0	0	0	15
Total	29	4	33	3	26	29	0	0	0	62
08:00 AM	5	2	7	0	4	4	0	0	0	11
08:15 AM	6	3	9	2	6	8	0	0	0	17
08:30 AM	10	4	14	2	14	16	0	0	0	30
08:45 AM	6	1	7	4	8	12	0	0	0	19
Total	27	10	37	8	32	40	0	0	0	77
Grand Total	56	14	70	11	58	69	0	0	0	139
Apprch %	80	20		15.9	84.1		0	0		
Total %	40.3	10.1	50.4	7.9	41.7	49.6	0	0	0	

Start Time	Waterman Avenue Southbound			Waterman Avenue Northbound			I-10 Westbound On Ramp Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
07:30 AM	7	0	7	1	7	8	0	0	0	15
07:45 AM	8	0	8	0	7	7	0	0	0	15
08:00 AM	5	2	7	0	4	4	0	0	0	11
08:15 AM	6	3	9	2	6	8	0	0	0	17
Total Volume	26	5	31	3	24	27	0	0	0	58
% App. Total	83.9	16.1		11.1	88.9		0	0		
PHF	.813	.417	.861	.375	.857	.844	.000	.000	.000	.853

Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:30 AM

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Westbound On Ramp
 Weather: Clear

File Name : 12-SBCWT10WAM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 2



Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:30 AM			07:30 AM			07:30 AM		
+0 mins.	7	0	7	1	7	8	0	0	0
+15 mins.	8	0	8	0	7	7	0	0	0
+30 mins.	5	2	7	0	4	4	0	0	0
+45 mins.	6	3	9	2	6	8	0	0	0
Total Volume	26	5	31	3	24	27	0	0	0
% App. Total	83.9	16.1		11.1	88.9		0	0	
PHF	.813	.417	.861	.375	.857	.844	.000	.000	.000

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Westbound On Ramp
 Weather: Clear

File Name : 12-SBCWT10WAM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 1

Groups Printed- 3 Axle Vehicles

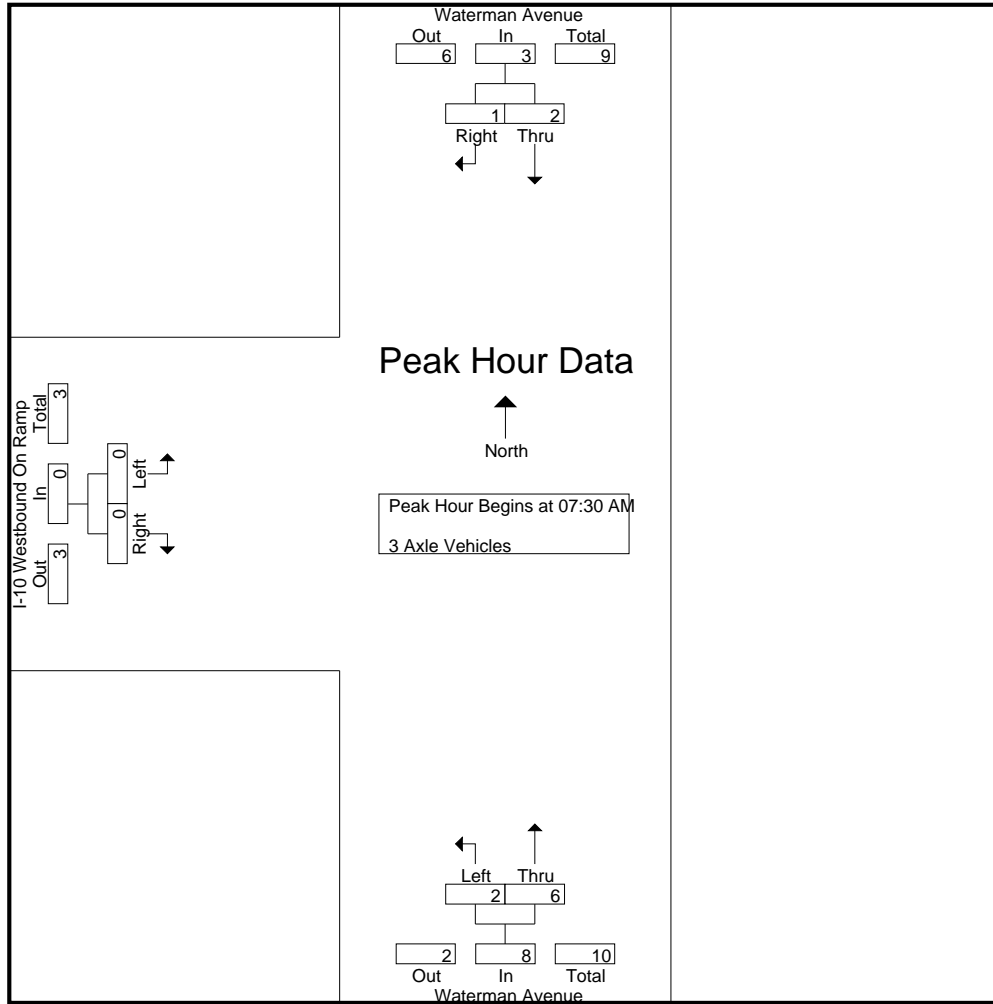
Start Time	Waterman Avenue Southbound			Waterman Avenue Northbound			I-10 Westbound On Ramp Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
07:00 AM	1	0	1	1	0	1	0	0	0	2
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	1	0	1	0	1	1	0	0	0	2
07:45 AM	1	0	1	0	0	0	0	0	0	1
Total	3	0	3	1	1	2	0	0	0	5
08:00 AM	0	0	0	0	4	4	0	0	0	4
08:15 AM	0	1	1	2	1	3	0	0	0	4
08:30 AM	2	2	4	2	1	3	0	0	0	7
08:45 AM	1	0	1	0	2	2	0	0	0	3
Total	3	3	6	4	8	12	0	0	0	18
Grand Total	6	3	9	5	9	14	0	0	0	23
Apprch %	66.7	33.3		35.7	64.3		0	0		
Total %	26.1	13	39.1	21.7	39.1	60.9	0	0	0	

Start Time	Waterman Avenue Southbound			Waterman Avenue Northbound			I-10 Westbound On Ramp Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
07:30 AM	1	0	1	0	1	1	0	0	0	2
07:45 AM	1	0	1	0	0	0	0	0	0	1
08:00 AM	0	0	0	0	4	4	0	0	0	4
08:15 AM	0	1	1	2	1	3	0	0	0	4
Total Volume	2	1	3	2	6	8	0	0	0	11
% App. Total	66.7	33.3		25	75		0	0		
PHF	.500	.250	.750	.250	.375	.500	.000	.000	.000	.688

Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:30 AM

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Westbound On Ramp
 Weather: Clear

File Name : 12-SBCWT10WAM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 2



Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:30 AM			07:30 AM			07:30 AM		
+0 mins.	1	0	1	0	1	1	0	0	0
+15 mins.	1	0	1	0	0	0	0	0	0
+30 mins.	0	0	0	0	4	4	0	0	0
+45 mins.	0	1	1	2	1	3	0	0	0
Total Volume	2	1	3	2	6	8	0	0	0
% App. Total	66.7	33.3		25	75		0	0	
PHF	.500	.250	.750	.250	.375	.500	.000	.000	.000

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Westbound On Ramp
 Weather: Clear

File Name : 12-SBCWT10WAM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 1

Groups Printed- 4+ Axle Trucks

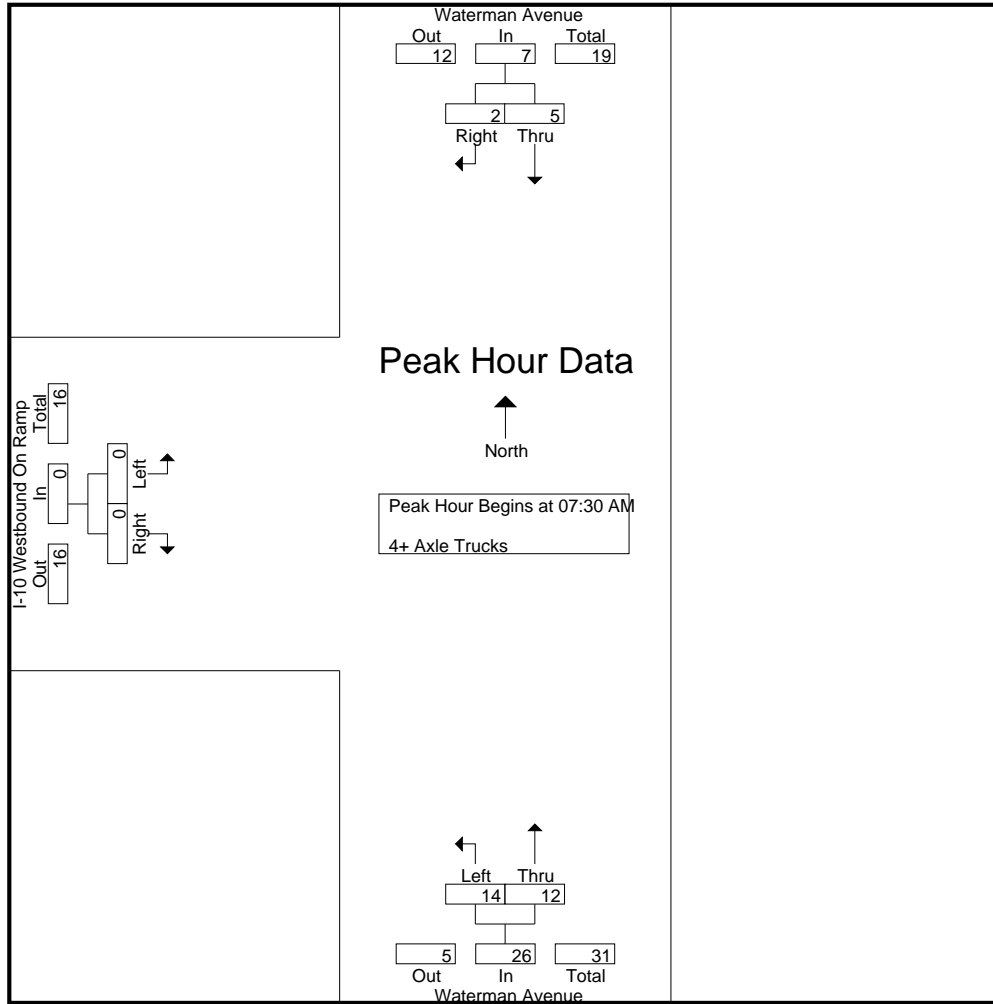
Start Time	Waterman Avenue Southbound			Waterman Avenue Northbound			I-10 Westbound On Ramp Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
07:00 AM	3	4	7	5	1	6	0	0	0	13
07:15 AM	2	3	5	3	6	9	0	0	0	14
07:30 AM	2	1	3	3	4	7	0	0	0	10
07:45 AM	2	0	2	4	2	6	0	0	0	8
Total	9	8	17	15	13	28	0	0	0	45
08:00 AM	1	0	1	3	3	6	0	0	0	7
08:15 AM	0	1	1	4	3	7	0	0	0	8
08:30 AM	1	1	2	2	5	7	0	0	0	9
08:45 AM	1	0	1	3	5	8	0	0	0	9
Total	3	2	5	12	16	28	0	0	0	33
Grand Total	12	10	22	27	29	56	0	0	0	78
Apprch %	54.5	45.5		48.2	51.8		0	0		
Total %	15.4	12.8	28.2	34.6	37.2	71.8	0	0	0	

Start Time	Waterman Avenue Southbound			Waterman Avenue Northbound			I-10 Westbound On Ramp Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
07:30 AM	2	1	3	3	4	7	0	0	0	10
07:45 AM	2	0	2	4	2	6	0	0	0	8
08:00 AM	1	0	1	3	3	6	0	0	0	7
08:15 AM	0	1	1	4	3	7	0	0	0	8
Total Volume	5	2	7	14	12	26	0	0	0	33
% App. Total	71.4	28.6		53.8	46.2		0	0		
PHF	.625	.500	.583	.875	.750	.929	.000	.000	.000	.825

Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:30 AM

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Westbound On Ramp
 Weather: Clear

File Name : 12-SBCWT10WAM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 2



Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:30 AM			07:30 AM			07:30 AM		
+0 mins.	2	1	3	3	4	7	0	0	0
+15 mins.	2	0	2	4	2	6	0	0	0
+30 mins.	1	0	1	3	3	6	0	0	0
+45 mins.	0	1	1	4	3	7	0	0	0
Total Volume	5	2	7	14	12	26	0	0	0
% App. Total	71.4	28.6		53.8	46.2		0	0	
PHF	.625	.500	.583	.875	.750	.929	.000	.000	.000

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Westbound On Ramp
 Weather: Clear

File Name : 12-SBCWT10WPM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 1

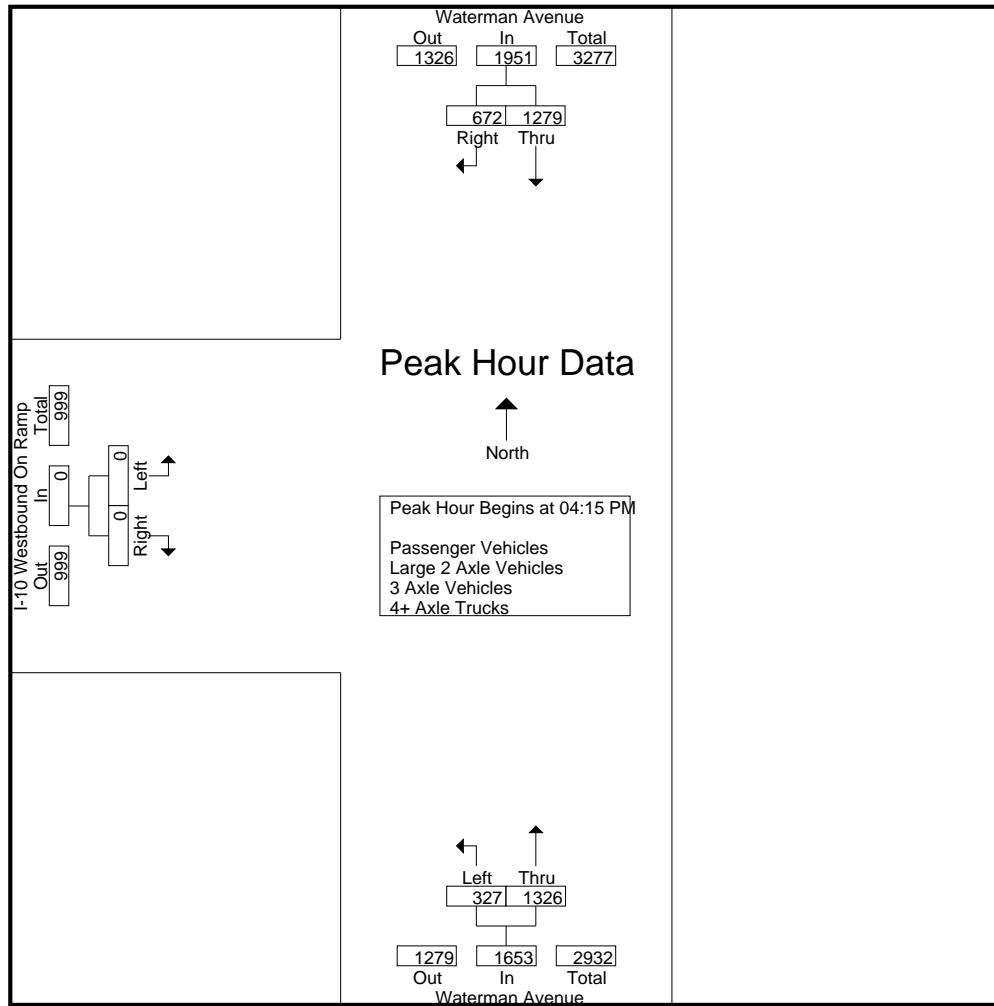
Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	Waterman Avenue Southbound			Waterman Avenue Northbound			I-10 Westbound On Ramp Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
04:00 PM	312	134	446	87	341	428	0	0	0	874
04:15 PM	310	134	444	97	347	444	0	0	0	888
04:30 PM	299	182	481	90	350	440	0	0	0	921
04:45 PM	291	126	417	83	314	397	0	0	0	814
Total	1212	576	1788	357	1352	1709	0	0	0	3497
05:00 PM	379	230	609	57	315	372	0	0	0	981
05:15 PM	306	174	480	77	313	390	0	0	0	870
05:30 PM	282	139	421	95	331	426	0	0	0	847
05:45 PM	221	96	317	78	310	388	0	0	0	705
Total	1188	639	1827	307	1269	1576	0	0	0	3403
Grand Total	2400	1215	3615	664	2621	3285	0	0	0	6900
Apprch %	66.4	33.6		20.2	79.8		0	0		
Total %	34.8	17.6	52.4	9.6	38	47.6	0	0	0	
Passenger Vehicles	2356	1196	3552	646	2565	3211	0	0	0	6763
% Passenger Vehicles	98.2	98.4	98.3	97.3	97.9	97.7	0	0	0	98
Large 2 Axle Vehicles	31	6	37	10	27	37	0	0	0	74
% Large 2 Axle Vehicles	1.3	0.5	1	1.5	1	1.1	0	0	0	1.1
3 Axle Vehicles	2	0	2	1	4	5	0	0	0	7
% 3 Axle Vehicles	0.1	0	0.1	0.2	0.2	0.2	0	0	0	0.1
4+ Axle Trucks	11	13	24	7	25	32	0	0	0	56
% 4+ Axle Trucks	0.5	1.1	0.7	1.1	1	1	0	0	0	0.8

Start Time	Waterman Avenue Southbound			Waterman Avenue Northbound			I-10 Westbound On Ramp Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	310	134	444	97	347	444	0	0	0	888
04:30 PM	299	182	481	90	350	440	0	0	0	921
04:45 PM	291	126	417	83	314	397	0	0	0	814
05:00 PM	379	230	609	57	315	372	0	0	0	981
Total Volume	1279	672	1951	327	1326	1653	0	0	0	3604
% App. Total	65.6	34.4		19.8	80.2		0	0		
PHF	.844	.730	.801	.843	.947	.931	.000	.000	.000	.918

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Westbound On Ramp
 Weather: Clear

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Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:30 PM			04:00 PM			04:00 PM		
+0 mins.	299	182	481	87	341	428	0	0	0
+15 mins.	291	126	417	97	347	444	0	0	0
+30 mins.	379	230	609	90	350	440	0	0	0
+45 mins.	306	174	480	83	314	397	0	0	0
Total Volume	1275	712	1987	357	1352	1709	0	0	0
% App. Total	64.2	35.8		20.9	79.1		0	0	
PHF	.841	.774	.816	.920	.966	.962	.000	.000	.000

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Westbound On Ramp
 Weather: Clear

File Name : 12-SBCWT10WPM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
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Groups Printed- Passenger Vehicles

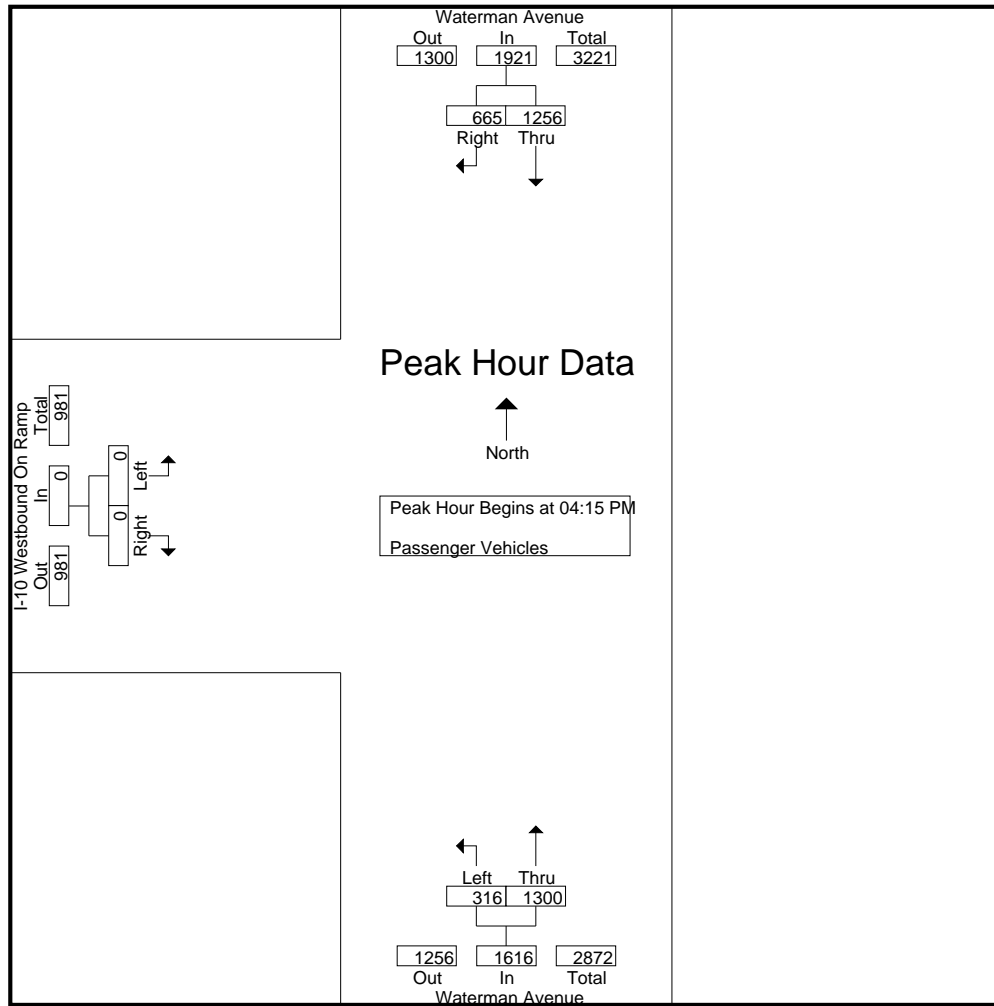
Start Time	Waterman Avenue Southbound			Waterman Avenue Northbound			I-10 Westbound On Ramp Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
04:00 PM	305	132	437	86	330	416	0	0	0	853
04:15 PM	306	132	438	96	340	436	0	0	0	874
04:30 PM	291	182	473	87	343	430	0	0	0	903
04:45 PM	285	121	406	80	308	388	0	0	0	794
Total	1187	567	1754	349	1321	1670	0	0	0	3424
05:00 PM	374	230	604	53	309	362	0	0	0	966
05:15 PM	300	173	473	75	307	382	0	0	0	855
05:30 PM	279	131	410	94	328	422	0	0	0	832
05:45 PM	216	95	311	75	300	375	0	0	0	686
Total	1169	629	1798	297	1244	1541	0	0	0	3339
Grand Total	2356	1196	3552	646	2565	3211	0	0	0	6763
Apprch %	66.3	33.7		20.1	79.9		0	0		
Total %	34.8	17.7	52.5	9.6	37.9	47.5	0	0	0	

Start Time	Waterman Avenue Southbound			Waterman Avenue Northbound			I-10 Westbound On Ramp Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
04:15 PM	306	132	438	96	340	436	0	0	0	874
04:30 PM	291	182	473	87	343	430	0	0	0	903
04:45 PM	285	121	406	80	308	388	0	0	0	794
05:00 PM	374	230	604	53	309	362	0	0	0	966
Total Volume	1256	665	1921	316	1300	1616	0	0	0	3537
% App. Total	65.4	34.6		19.6	80.4		0	0		
PHF	.840	.723	.795	.823	.948	.927	.000	.000	.000	.915

Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:15 PM

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Westbound On Ramp
 Weather: Clear

File Name : 12-SBCWT10WPM REDO
 Site Code : 05117141
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Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:15 PM			04:15 PM			04:15 PM		
+0 mins.	306	132	438	96	340	436	0	0	0
+15 mins.	291	182	473	87	343	430	0	0	0
+30 mins.	285	121	406	80	308	388	0	0	0
+45 mins.	374	230	604	53	309	362	0	0	0
Total Volume	1256	665	1921	316	1300	1616	0	0	0
% App. Total	65.4	34.6		19.6	80.4		0	0	
PHF	.840	.723	.795	.823	.948	.927	.000	.000	.000

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Westbound On Ramp
 Weather: Clear

File Name : 12-SBCWT10WPM REDO
 Site Code : 05117141
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Groups Printed- Large 2 Axle Vehicles

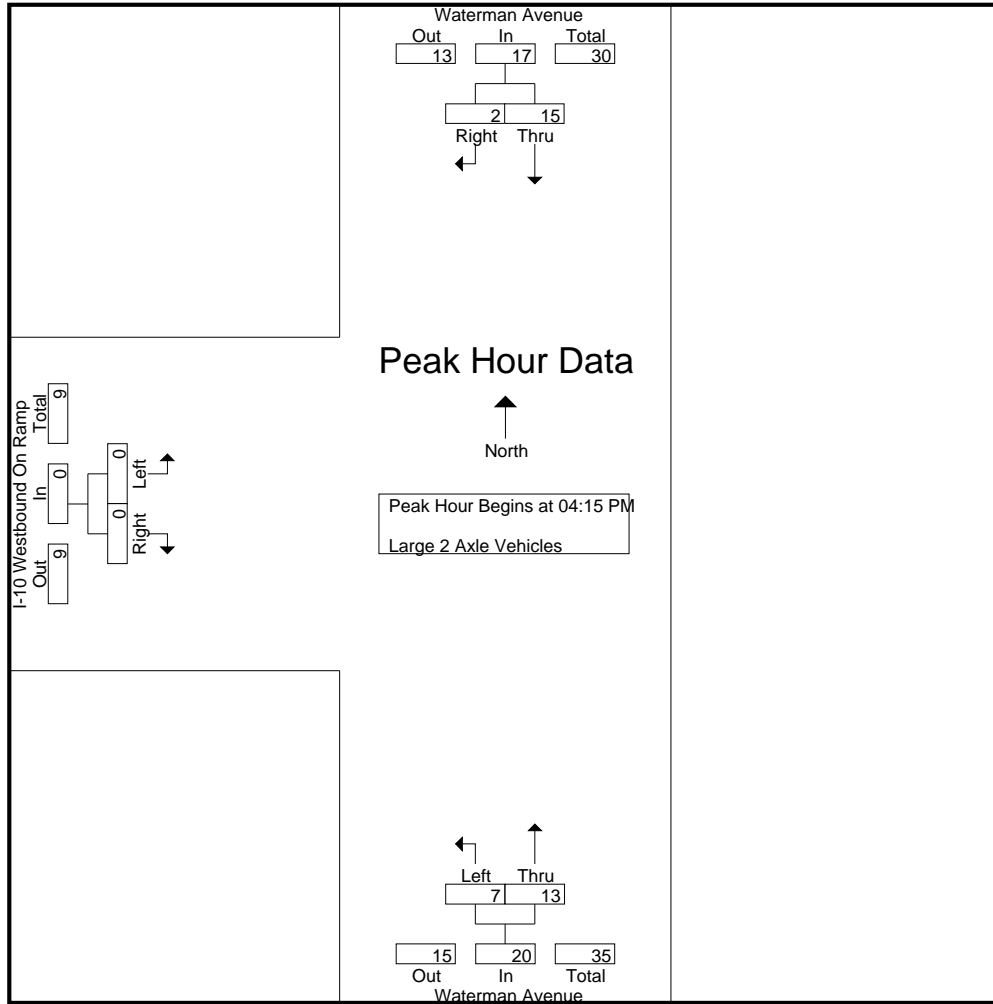
Start Time	Waterman Avenue Southbound			Waterman Avenue Northbound			I-10 Westbound On Ramp Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
04:00 PM	4	0	4	0	5	5	0	0	0	9
04:15 PM	1	0	1	1	3	4	0	0	0	5
04:30 PM	6	0	6	1	5	6	0	0	0	12
04:45 PM	4	2	6	2	3	5	0	0	0	11
Total	15	2	17	4	16	20	0	0	0	37
05:00 PM	4	0	4	3	2	5	0	0	0	9
05:15 PM	5	1	6	0	3	3	0	0	0	9
05:30 PM	3	3	6	1	2	3	0	0	0	9
05:45 PM	4	0	4	2	4	6	0	0	0	10
Total	16	4	20	6	11	17	0	0	0	37
Grand Total	31	6	37	10	27	37	0	0	0	74
Apprch %	83.8	16.2		27	73		0	0		
Total %	41.9	8.1	50	13.5	36.5	50	0	0	0	

Start Time	Waterman Avenue Southbound			Waterman Avenue Northbound			I-10 Westbound On Ramp Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
04:15 PM	1	0	1	1	3	4	0	0	0	5
04:30 PM	6	0	6	1	5	6	0	0	0	12
04:45 PM	4	2	6	2	3	5	0	0	0	11
05:00 PM	4	0	4	3	2	5	0	0	0	9
Total Volume	15	2	17	7	13	20	0	0	0	37
% App. Total	88.2	11.8		35	65		0	0		
PHF	.625	.250	.708	.583	.650	.833	.000	.000	.000	.771

Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:15 PM

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Westbound On Ramp
 Weather: Clear

File Name : 12-SBCWT10WPM REDO
 Site Code : 05117141
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Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:15 PM			04:15 PM			04:15 PM		
+0 mins.	1	0	1	1	3	4	0	0	0
+15 mins.	6	0	6	1	5	6	0	0	0
+30 mins.	4	2	6	2	3	5	0	0	0
+45 mins.	4	0	4	3	2	5	0	0	0
Total Volume	15	2	17	7	13	20	0	0	0
% App. Total	88.2	11.8		35	65		0	0	
PHF	.625	.250	.708	.583	.650	.833	.000	.000	.000

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Westbound On Ramp
 Weather: Clear

File Name : 12-SBCWT10WPM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 1

Groups Printed- 3 Axle Vehicles

Start Time	Waterman Avenue Southbound			Waterman Avenue Northbound			I-10 Westbound On Ramp Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
04:00 PM	0	0	0	1	0	1	0	0	0	1
04:15 PM	1	0	1	0	0	0	0	0	0	1
04:30 PM	1	0	1	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	1	1	0	0	0	1
Total	2	0	2	1	1	2	0	0	0	4
05:00 PM	0	0	0	0	2	2	0	0	0	2
05:15 PM	0	0	0	0	1	1	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	3	3	0	0	0	3
Grand Total	2	0	2	1	4	5	0	0	0	7
Apprch %	100	0		20	80		0	0		
Total %	28.6	0	28.6	14.3	57.1	71.4	0	0	0	

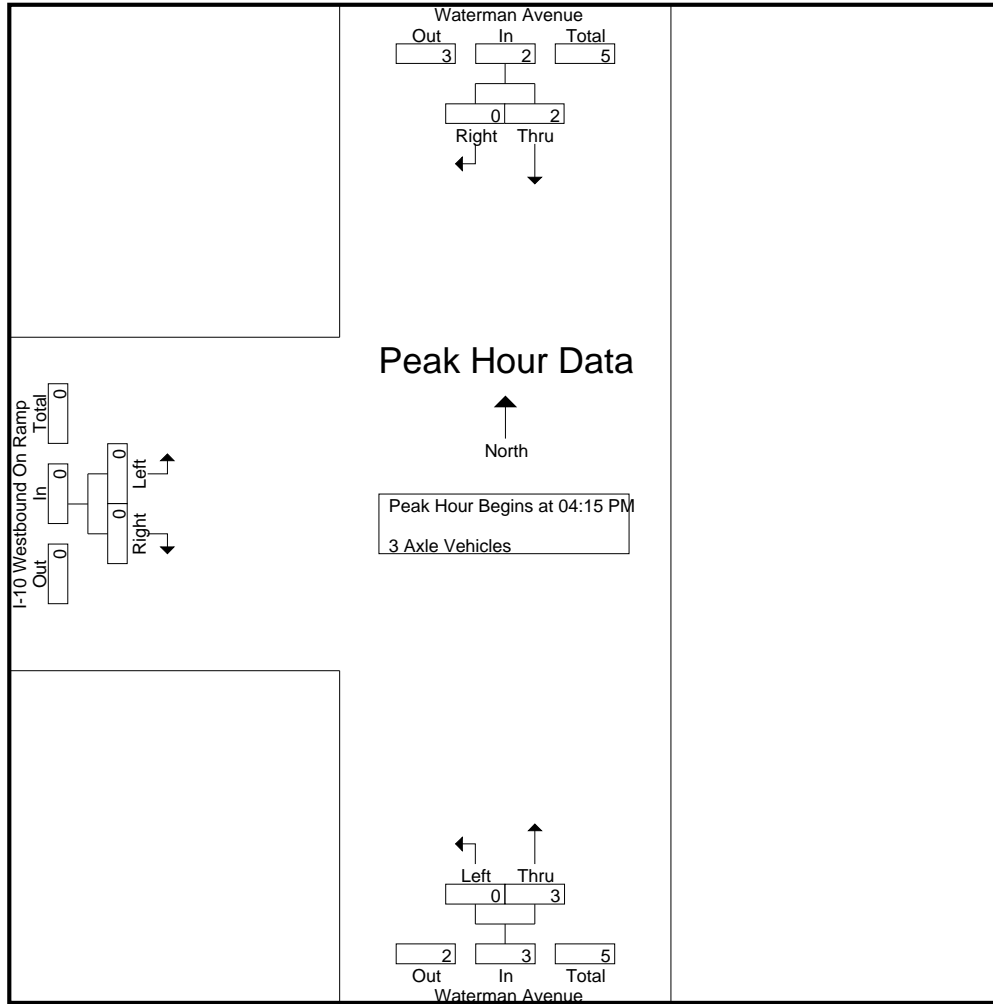
Start Time	Waterman Avenue Southbound			Waterman Avenue Northbound			I-10 Westbound On Ramp Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
04:15 PM	1	0	1	0	0	0	0	0	0	1
04:30 PM	1	0	1	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	1	1	0	0	0	1
05:00 PM	0	0	0	0	2	2	0	0	0	2
Total Volume	2	0	2	0	3	3	0	0	0	5
% App. Total	100	0		0	100		0	0		
PHF	.500	.000	.500	.000	.375	.375	.000	.000	.000	.625

Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:15 PM

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Westbound On Ramp
 Weather: Clear

File Name : 12-SBCWT10WPM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
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Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:15 PM			04:15 PM			04:15 PM		
+0 mins.	1	0	1	0	0	0	0	0	0
+15 mins.	1	0	1	0	0	0	0	0	0
+30 mins.	0	0	0	0	1	1	0	0	0
+45 mins.	0	0	0	0	2	2	0	0	0
Total Volume	2	0	2	0	3	3	0	0	0
% App. Total	100	0	100	0	100	100	0	0	0
PHF	.500	.000	.500	.000	.375	.375	.000	.000	.000

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Westbound On Ramp
 Weather: Clear

File Name : 12-SBCWT10WPM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
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Groups Printed- 4+ Axle Trucks

Start Time	Waterman Avenue Southbound			Waterman Avenue Northbound			I-10 Westbound On Ramp Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
04:00 PM	3	2	5	0	6	6	0	0	0	11
04:15 PM	2	2	4	0	4	4	0	0	0	8
04:30 PM	1	0	1	2	2	4	0	0	0	5
04:45 PM	2	3	5	1	2	3	0	0	0	8
Total	8	7	15	3	14	17	0	0	0	32
05:00 PM	1	0	1	1	2	3	0	0	0	4
05:15 PM	1	0	1	2	2	4	0	0	0	5
05:30 PM	0	5	5	0	1	1	0	0	0	6
05:45 PM	1	1	2	1	6	7	0	0	0	9
Total	3	6	9	4	11	15	0	0	0	24
Grand Total	11	13	24	7	25	32	0	0	0	56
Apprch %	45.8	54.2		21.9	78.1		0	0		
Total %	19.6	23.2	42.9	12.5	44.6	57.1	0	0	0	

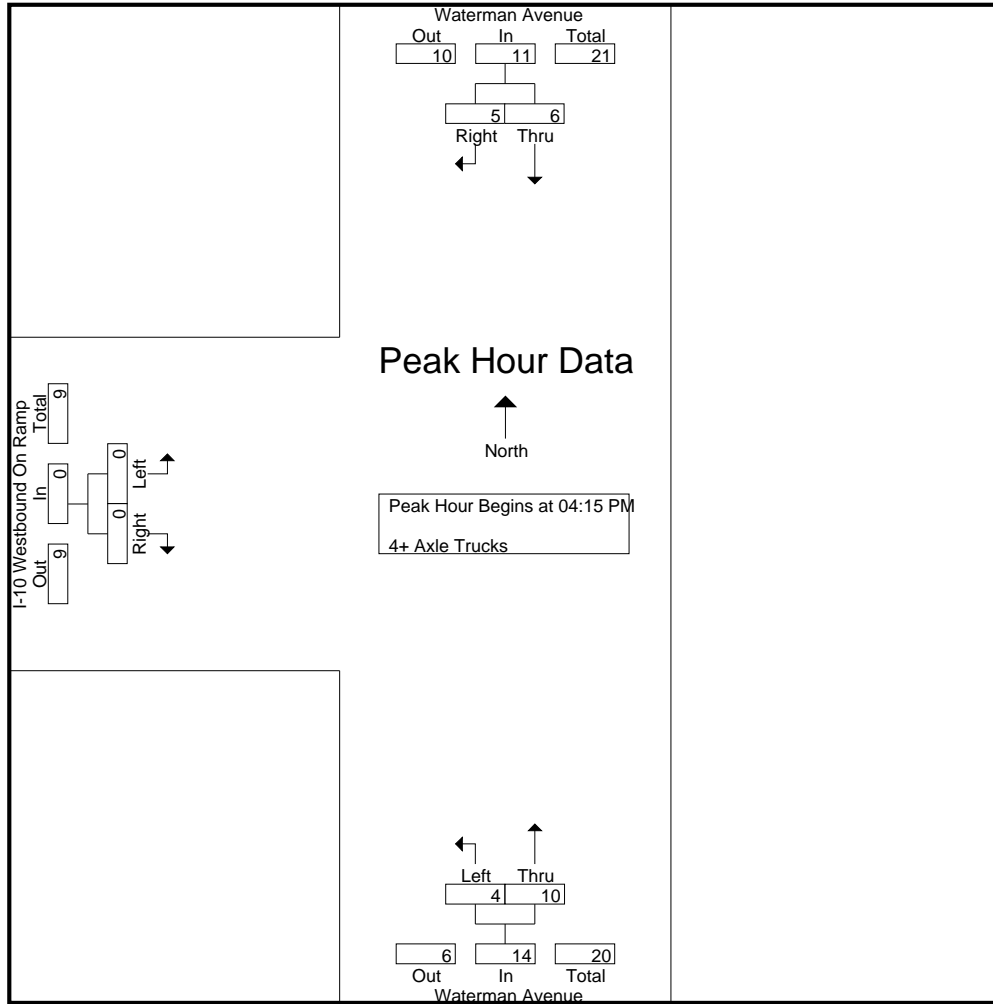
Start Time	Waterman Avenue Southbound			Waterman Avenue Northbound			I-10 Westbound On Ramp Eastbound			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
04:15 PM	2	2	4	0	4	4	0	0	0	8
04:30 PM	1	0	1	2	2	4	0	0	0	5
04:45 PM	2	3	5	1	2	3	0	0	0	8
05:00 PM	1	0	1	1	2	3	0	0	0	4
Total Volume	6	5	11	4	10	14	0	0	0	25
% App. Total	54.5	45.5		28.6	71.4		0	0		
PHF	.750	.417	.550	.500	.625	.875	.000	.000	.000	.781

Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:15 PM

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Westbound On Ramp
 Weather: Clear

File Name : 12-SBCWT10WPM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
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Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:15 PM			04:15 PM			04:15 PM		
+0 mins.	2	2	4	0	4	4	0	0	0
+15 mins.	1	0	1	2	2	4	0	0	0
+30 mins.	2	3	5	1	2	3	0	0	0
+45 mins.	1	0	1	1	2	3	0	0	0
Total Volume	6	5	11	4	10	14	0	0	0
% App. Total	54.5	45.5		28.6	71.4		0	0	
PHF	.750	.417	.550	.500	.625	.875	.000	.000	.000

Location: San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Westbound On Ramp



Date: 3/14/2017
 Day: Tuesday

PEDESTRIANS

	North Leg Waterman Avenue	East Leg Dead End	South Leg Waterman Avenue	West Leg I-10 Westbound On Ramp	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	3	3
TOTAL VOLUMES:	0	0	0	3	3

	North Leg Waterman Avenue	East Leg Dead End	South Leg Waterman Avenue	West Leg I-10 Westbound On Ramp	TOTAL
4:00 PM	0	0	0	1	1
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	1	1
5:15 PM	0	0	0	7	7
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	9	9

Location: San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Westbound On Ramp



Date: 3/14/2017
 Day: Tuesday

BICYCLES

	North Leg Waterman Avenue	East Leg Dead End	South Leg Waterman Avenue	West Leg I-10 Westbound On Ramp	TOTAL
7:00 AM	0	0	0	1	1
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	1	1

	North Leg Waterman Avenue	East Leg Dead End	South Leg Waterman Avenue	West Leg I-10 Westbound On Ramp	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	3	3
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	1	1
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	4	4

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Eastbound Ramps
 Weather: Clear

File Name : 13-SBCWT10EAM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 1

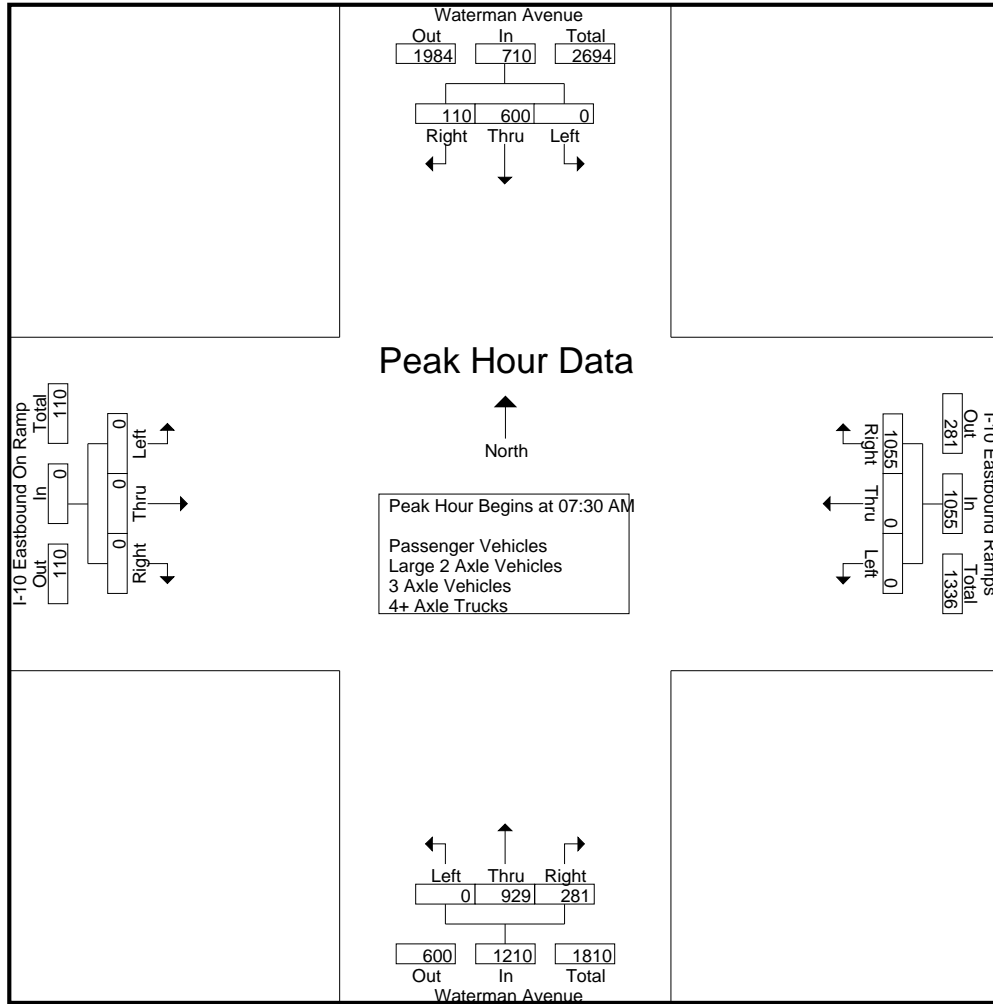
Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	Waterman Avenue Southbound				I-10 Eastbound Ramps Westbound				Waterman Avenue Northbound				I-10 Eastbound On Ramp Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	0	101	22	123	0	0	203	203	0	173	50	223	0	0	0	0	549
07:15 AM	0	117	17	134	0	0	269	269	0	182	54	236	0	0	0	0	639
07:30 AM	0	147	20	167	0	0	266	266	0	219	62	281	0	0	0	0	714
07:45 AM	0	151	28	179	0	0	282	282	0	247	74	321	0	0	0	0	782
Total	0	516	87	603	0	0	1020	1020	0	821	240	1061	0	0	0	0	2684
08:00 AM	0	132	33	165	0	0	273	273	0	226	69	295	0	0	0	0	733
08:15 AM	0	170	29	199	0	0	234	234	0	237	76	313	0	0	0	0	746
08:30 AM	0	113	32	145	0	0	241	241	0	209	55	264	0	0	0	0	650
08:45 AM	0	113	38	151	0	0	246	246	0	224	63	287	0	0	0	0	684
Total	0	528	132	660	0	0	994	994	0	896	263	1159	0	0	0	0	2813
Grand Total	0	1044	219	1263	0	0	2014	2014	0	1717	503	2220	0	0	0	0	5497
Apprch %	0	82.7	17.3		0	0	100		0	77.3	22.7		0	0	0		
Total %	0	19	4	23	0	0	36.6	36.6	0	31.2	9.2	40.4	0	0	0	0	
Passenger Vehicles	0	1000	190	1190	0	0	1958	1958	0	1628	482	2110	0	0	0	0	5258
% Passenger Vehicles	0	95.8	86.8	94.2	0	0	97.2	97.2	0	94.8	95.8	95	0	0	0	0	95.7
Large 2 Axle Vehicles	0	32	25	57	0	0	32	32	0	39	6	45	0	0	0	0	134
% Large 2 Axle Vehicles	0	3.1	11.4	4.5	0	0	1.6	1.6	0	2.3	1.2	2	0	0	0	0	2.4
3 Axle Vehicles	0	4	0	4	0	0	6	6	0	10	1	11	0	0	0	0	21
% 3 Axle Vehicles	0	0.4	0	0.3	0	0	0.3	0.3	0	0.6	0.2	0.5	0	0	0	0	0.4
4+ Axle Trucks	0	8	4	12	0	0	18	18	0	40	14	54	0	0	0	0	84
% 4+ Axle Trucks	0	0.8	1.8	1	0	0	0.9	0.9	0	2.3	2.8	2.4	0	0	0	0	1.5

Start Time	Waterman Avenue Southbound				I-10 Eastbound Ramps Westbound				Waterman Avenue Northbound				I-10 Eastbound On Ramp Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	147	20	167	0	0	266	266	0	219	62	281	0	0	0	0	714
07:45 AM	0	151	28	179	0	0	282	282	0	247	74	321	0	0	0	0	782
08:00 AM	0	132	33	165	0	0	273	273	0	226	69	295	0	0	0	0	733
08:15 AM	0	170	29	199	0	0	234	234	0	237	76	313	0	0	0	0	746
Total Volume	0	600	110	710	0	0	1055	1055	0	929	281	1210	0	0	0	0	2975
% App. Total	0	84.5	15.5		0	0	100		0	76.8	23.2		0	0	0		
PHF	.000	.882	.833	.892	.000	.000	.935	.935	.000	.940	.924	.942	.000	.000	.000	.000	.951

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Eastbound Ramps
 Weather: Clear

File Name : 13-SBCWT10EAM REDO
 Site Code : 05117141
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Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:30 AM				07:15 AM				07:30 AM				07:00 AM			
+0 mins.	0	147	20	167	0	0	269	269	0	219	62	281	0	0	0	0
+15 mins.	0	151	28	179	0	0	266	266	0	247	74	321	0	0	0	0
+30 mins.	0	132	33	165	0	0	282	282	0	226	69	295	0	0	0	0
+45 mins.	0	170	29	199	0	0	273	273	0	237	76	313	0	0	0	0
Total Volume	0	600	110	710	0	0	1090	1090	0	929	281	1210	0	0	0	0
% App. Total	0	84.5	15.5		0	0	100		0	76.8	23.2		0	0	0	
PHF	.000	.882	.833	.892	.000	.000	.966	.966	.000	.940	.924	.942	.000	.000	.000	.000

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Eastbound Ramps
 Weather: Clear

File Name : 13-SBCWT10EAM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
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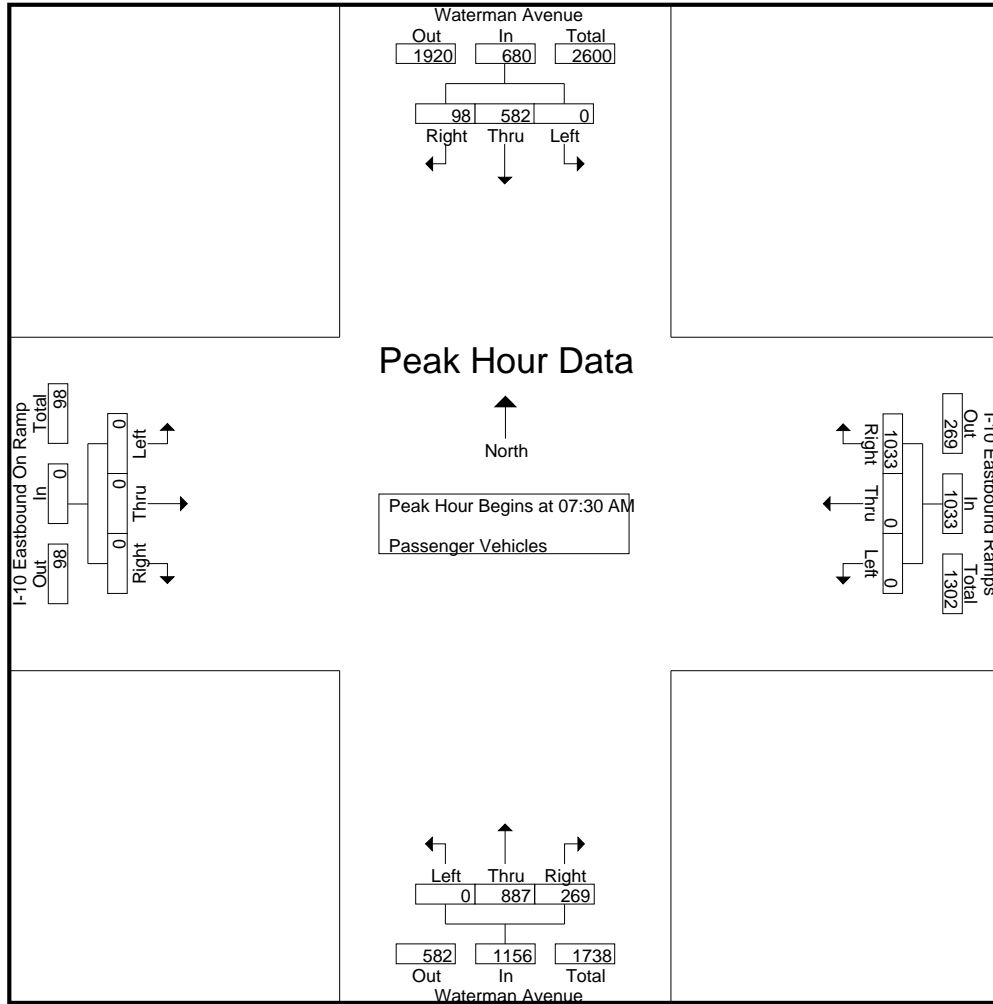
Groups Printed- Passenger Vehicles

Start Time	Waterman Avenue Southbound				I-10 Eastbound Ramps Westbound				Waterman Avenue Northbound				I-10 Eastbound On Ramp Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	0	98	16	114	0	0	197	197	0	163	46	209	0	0	0	0	520
07:15 AM	0	111	11	122	0	0	262	262	0	173	52	225	0	0	0	0	609
07:30 AM	0	140	17	157	0	0	261	261	0	207	61	268	0	0	0	0	686
07:45 AM	0	146	22	168	0	0	274	274	0	237	68	305	0	0	0	0	747
Total	0	495	66	561	0	0	994	994	0	780	227	1007	0	0	0	0	2562
08:00 AM	0	130	31	161	0	0	267	267	0	220	66	286	0	0	0	0	714
08:15 AM	0	166	28	194	0	0	231	231	0	223	74	297	0	0	0	0	722
08:30 AM	0	102	30	132	0	0	230	230	0	195	54	249	0	0	0	0	611
08:45 AM	0	107	35	142	0	0	236	236	0	210	61	271	0	0	0	0	649
Total	0	505	124	629	0	0	964	964	0	848	255	1103	0	0	0	0	2696
Grand Total	0	1000	190	1190	0	0	1958	1958	0	1628	482	2110	0	0	0	0	5258
Apprch %	0	84	16		0	0	100		0	77.2	22.8		0	0	0		
Total %	0	19	3.6	22.6	0	0	37.2	37.2	0	31	9.2	40.1	0	0	0	0	

Start Time	Waterman Avenue Southbound				I-10 Eastbound Ramps Westbound				Waterman Avenue Northbound				I-10 Eastbound On Ramp Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	140	17	157	0	0	261	261	0	207	61	268	0	0	0	0	686
07:45 AM	0	146	22	168	0	0	274	274	0	237	68	305	0	0	0	0	747
08:00 AM	0	130	31	161	0	0	267	267	0	220	66	286	0	0	0	0	714
08:15 AM	0	166	28	194	0	0	231	231	0	223	74	297	0	0	0	0	722
Total Volume	0	582	98	680	0	0	1033	1033	0	887	269	1156	0	0	0	0	2869
% App. Total	0	85.6	14.4		0	0	100		0	76.7	23.3		0	0	0		
PHF	.000	.877	.790	.876	.000	.000	.943	.943	.000	.936	.909	.948	.000	.000	.000	.000	.960

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Eastbound Ramps
 Weather: Clear

File Name : 13-SBCWT10EAM REDO
 Site Code : 05117141
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Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	0	140	17	157	0	0	261	261	0	207	61	268	0	0	0	0
+15 mins.	0	146	22	168	0	0	274	274	0	237	68	305	0	0	0	0
+30 mins.	0	130	31	161	0	0	267	267	0	220	66	286	0	0	0	0
+45 mins.	0	166	28	194	0	0	231	231	0	223	74	297	0	0	0	0
Total Volume	0	582	98	680	0	0	1033	1033	0	887	269	1156	0	0	0	0
% App. Total	0	85.6	14.4		0	0	100		0	76.7	23.3		0	0	0	
PHF	.000	.877	.790	.876	.000	.000	.943	.943	.000	.936	.909	.948	.000	.000	.000	.000

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Eastbound Ramps
 Weather: Clear

File Name : 13-SBCWT10EAM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
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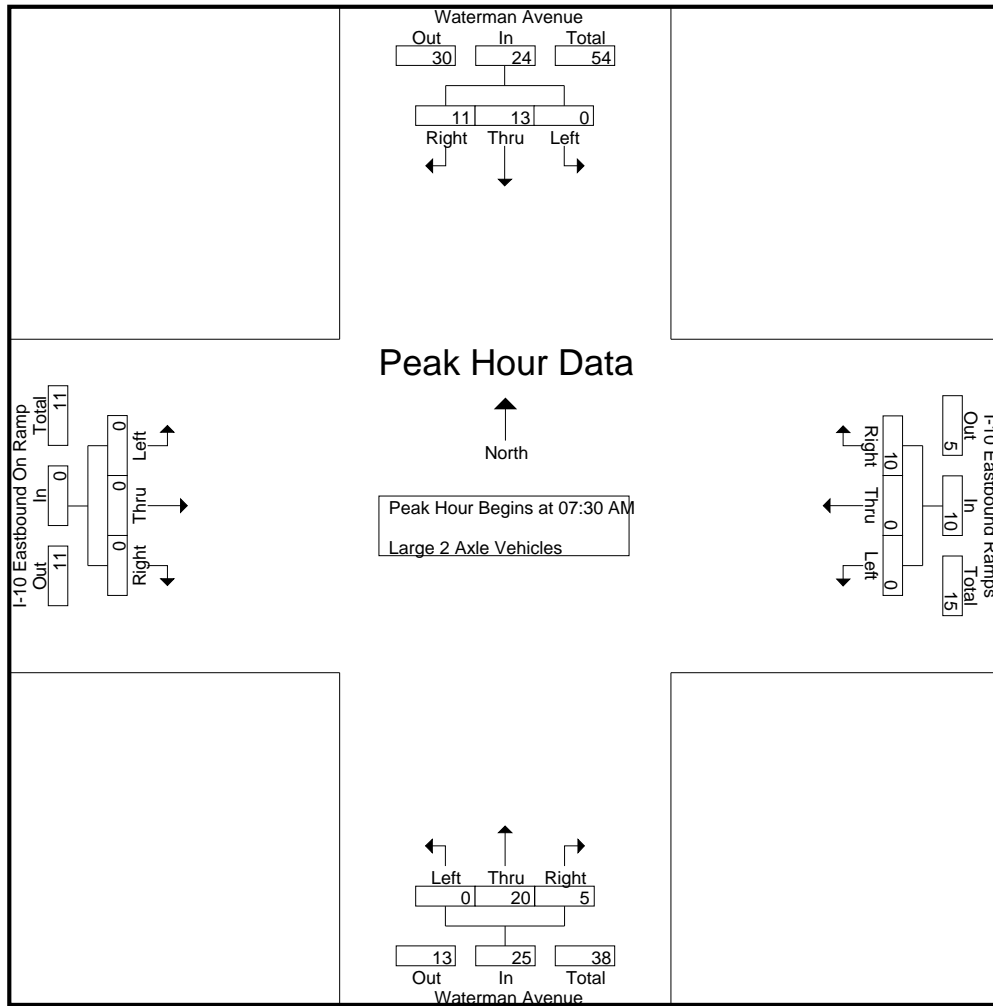
Groups Printed- Large 2 Axle Vehicles

Start Time	Waterman Avenue Southbound				I-10 Eastbound Ramps Westbound				Waterman Avenue Northbound				I-10 Eastbound On Ramp Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	0	2	4	6	0	0	6	6	0	3	1	4	0	0	0	0	16
07:15 AM	0	4	5	9	0	0	2	2	0	3	0	3	0	0	0	0	14
07:30 AM	0	4	3	7	0	0	1	1	0	8	1	9	0	0	0	0	17
07:45 AM	0	4	6	10	0	0	5	5	0	5	2	7	0	0	0	0	22
Total	0	14	18	32	0	0	14	14	0	19	4	23	0	0	0	0	69
08:00 AM	0	1	1	2	0	0	2	2	0	1	1	2	0	0	0	0	6
08:15 AM	0	4	1	5	0	0	2	2	0	6	1	7	0	0	0	0	14
08:30 AM	0	9	2	11	0	0	8	8	0	7	0	7	0	0	0	0	26
08:45 AM	0	4	3	7	0	0	6	6	0	6	0	6	0	0	0	0	19
Total	0	18	7	25	0	0	18	18	0	20	2	22	0	0	0	0	65
Grand Total	0	32	25	57	0	0	32	32	0	39	6	45	0	0	0	0	134
Apprch %	0	56.1	43.9		0	0	100		0	86.7	13.3		0	0	0		
Total %	0	23.9	18.7	42.5	0	0	23.9	23.9	0	29.1	4.5	33.6	0	0	0	0	

Start Time	Waterman Avenue Southbound				I-10 Eastbound Ramps Westbound				Waterman Avenue Northbound				I-10 Eastbound On Ramp Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	4	3	7	0	0	1	1	0	8	1	9	0	0	0	0	17
07:45 AM	0	4	6	10	0	0	5	5	0	5	2	7	0	0	0	0	22
08:00 AM	0	1	1	2	0	0	2	2	0	1	1	2	0	0	0	0	6
08:15 AM	0	4	1	5	0	0	2	2	0	6	1	7	0	0	0	0	14
Total Volume	0	13	11	24	0	0	10	10	0	20	5	25	0	0	0	0	59
% App. Total	0	54.2	45.8		0	0	100		0	80	20		0	0	0		
PHF	.000	.813	.458	.600	.000	.000	.500	.500	.000	.625	.625	.694	.000	.000	.000	.000	.670

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Eastbound Ramps
 Weather: Clear

File Name : 13-SBCWT10EAM REDO
 Site Code : 05117141
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Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	0	4	3	7	0	0	1	1	0	8	1	9	0	0	0	0
+15 mins.	0	4	6	10	0	0	5	5	0	5	2	7	0	0	0	0
+30 mins.	0	1	1	2	0	0	2	2	0	1	1	2	0	0	0	0
+45 mins.	0	4	1	5	0	0	2	2	0	6	1	7	0	0	0	0
Total Volume	0	13	11	24	0	0	10	10	0	20	5	25	0	0	0	0
% App. Total	0	54.2	45.8		0	0	100		0	80	20		0	0	0	
PHF	.000	.813	.458	.600	.000	.000	.500	.500	.000	.625	.625	.694	.000	.000	.000	.000

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Eastbound Ramps
 Weather: Clear

File Name : 13-SBCWT10EAM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 1

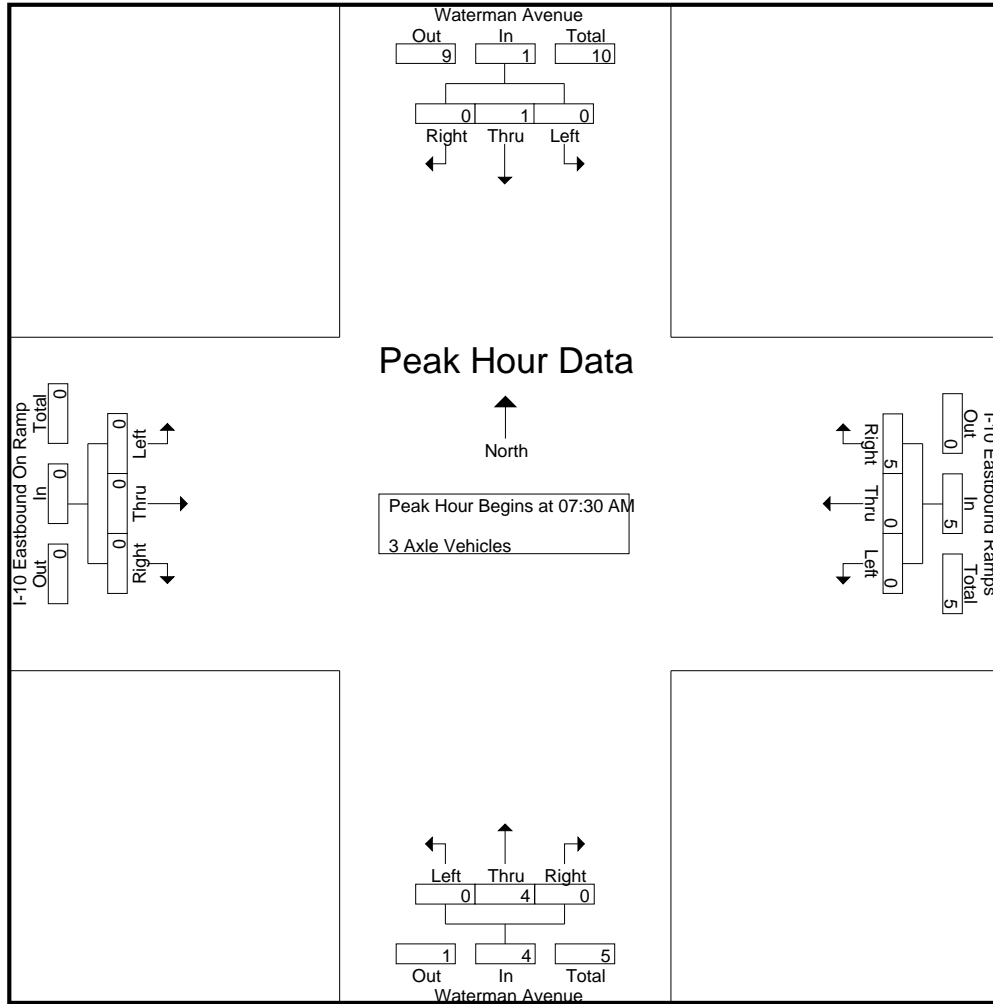
Groups Printed- 3 Axle Vehicles

Start Time	Waterman Avenue Southbound				I-10 Eastbound Ramps Westbound				Waterman Avenue Northbound				I-10 Eastbound On Ramp Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
07:30 AM	0	1	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
Total	0	1	0	1	0	0	1	1	0	1	1	2	0	0	0	0	4
08:00 AM	0	0	0	0	0	0	3	3	0	1	0	1	0	0	0	0	4
08:15 AM	0	0	0	0	0	0	1	1	0	2	0	2	0	0	0	0	3
08:30 AM	0	2	0	2	0	0	1	1	0	2	0	2	0	0	0	0	5
08:45 AM	0	1	0	1	0	0	0	0	0	4	0	4	0	0	0	0	5
Total	0	3	0	3	0	0	5	5	0	9	0	9	0	0	0	0	17
Grand Total	0	4	0	4	0	0	6	6	0	10	1	11	0	0	0	0	21
Apprch %	0	100	0		0	0	100		0	90.9	9.1		0	0	0		
Total %	0	19	0	19	0	0	28.6	28.6	0	47.6	4.8	52.4	0	0	0	0	

Start Time	Waterman Avenue Southbound				I-10 Eastbound Ramps Westbound				Waterman Avenue Northbound				I-10 Eastbound On Ramp Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	1	0	1	0	0	1	1	0	0	0	0	0	0	0	0	2
07:45 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
08:00 AM	0	0	0	0	0	0	3	3	0	1	0	1	0	0	0	0	4
08:15 AM	0	0	0	0	0	0	1	1	0	2	0	2	0	0	0	0	3
Total Volume	0	1	0	1	0	0	5	5	0	4	0	4	0	0	0	0	10
% App. Total	0	100	0		0	0	100		0	100	0		0	0	0		
PHF	.000	.250	.000	.250	.000	.000	.417	.417	.000	.500	.000	.500	.000	.000	.000	.000	.625

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Eastbound Ramps
 Weather: Clear

File Name : 13-SBCWT10EAM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
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Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	0	1	0	1	0	0	1	1	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
+30 mins.	0	0	0	0	0	0	3	3	0	1	0	1	0	0	0	0
+45 mins.	0	0	0	0	0	0	1	1	0	2	0	2	0	0	0	0
Total Volume	0	1	0	1	0	0	5	5	0	4	0	4	0	0	0	0
% App. Total	0	100	0	0	0	0	100	100	0	100	0	0	0	0	0	0
PHF	.000	.250	.000	.250	.000	.000	.417	.417	.000	.500	.000	.500	.000	.000	.000	.000

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Eastbound Ramps
 Weather: Clear

File Name : 13-SBCWT10EAM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
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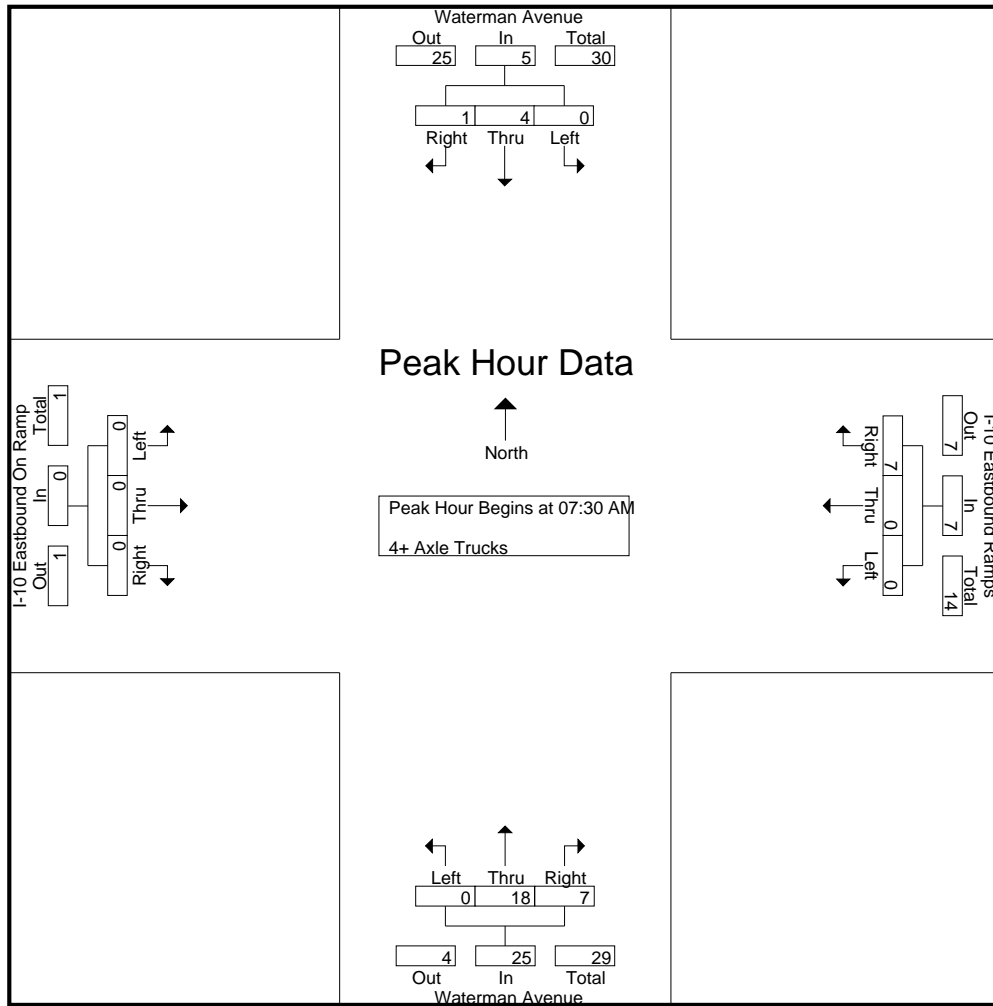
Groups Printed- 4+ Axle Trucks

Start Time	Waterman Avenue Southbound				I-10 Eastbound Ramps Westbound				Waterman Avenue Northbound				I-10 Eastbound On Ramp Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	0	1	2	3	0	0	0	0	0	7	3	10	0	0	0	0	13
07:15 AM	0	2	1	3	0	0	5	5	0	6	1	7	0	0	0	0	15
07:30 AM	0	2	0	2	0	0	3	3	0	4	0	4	0	0	0	0	9
07:45 AM	0	1	0	1	0	0	3	3	0	4	4	8	0	0	0	0	12
Total	0	6	3	9	0	0	11	11	0	21	8	29	0	0	0	0	49
08:00 AM	0	1	1	2	0	0	1	1	0	4	2	6	0	0	0	0	9
08:15 AM	0	0	0	0	0	0	0	0	0	6	1	7	0	0	0	0	7
08:30 AM	0	0	0	0	0	0	2	2	0	5	1	6	0	0	0	0	8
08:45 AM	0	1	0	1	0	0	4	4	0	4	2	6	0	0	0	0	11
Total	0	2	1	3	0	0	7	7	0	19	6	25	0	0	0	0	35
Grand Total	0	8	4	12	0	0	18	18	0	40	14	54	0	0	0	0	84
Apprch %	0	66.7	33.3		0	0	100		0	74.1	25.9		0	0	0		
Total %	0	9.5	4.8	14.3	0	0	21.4	21.4	0	47.6	16.7	64.3	0	0	0	0	

Start Time	Waterman Avenue Southbound				I-10 Eastbound Ramps Westbound				Waterman Avenue Northbound				I-10 Eastbound On Ramp Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	2	0	2	0	0	3	3	0	4	0	4	0	0	0	0	9
07:45 AM	0	1	0	1	0	0	3	3	0	4	4	8	0	0	0	0	12
08:00 AM	0	1	1	2	0	0	1	1	0	4	2	6	0	0	0	0	9
08:15 AM	0	0	0	0	0	0	0	0	0	6	1	7	0	0	0	0	7
Total Volume	0	4	1	5	0	0	7	7	0	18	7	25	0	0	0	0	37
% App. Total	0	80	20		0	0	100		0	72	28		0	0	0		
PHF	.000	.500	.250	.625	.000	.000	.583	.583	.000	.750	.438	.781	.000	.000	.000	.000	.771

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Eastbound Ramps
 Weather: Clear

File Name : 13-SBCWT10EAM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
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Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	0	2	0	2	0	0	3	3	0	4	0	4	0	0	0	0
+15 mins.	0	1	0	1	0	0	3	3	0	4	4	8	0	0	0	0
+30 mins.	0	1	1	2	0	0	1	1	0	4	2	6	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	6	1	7	0	0	0	0
Total Volume	0	4	1	5	0	0	7	7	0	18	7	25	0	0	0	0
% App. Total	0	80	20		0	0	100		0	72	28		0	0	0	
PHF	.000	.500	.250	.625	.000	.000	.583	.583	.000	.750	.438	.781	.000	.000	.000	.000

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Eastbound Ramps
 Weather: Clear

File Name : 13-SBCWT10EPM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
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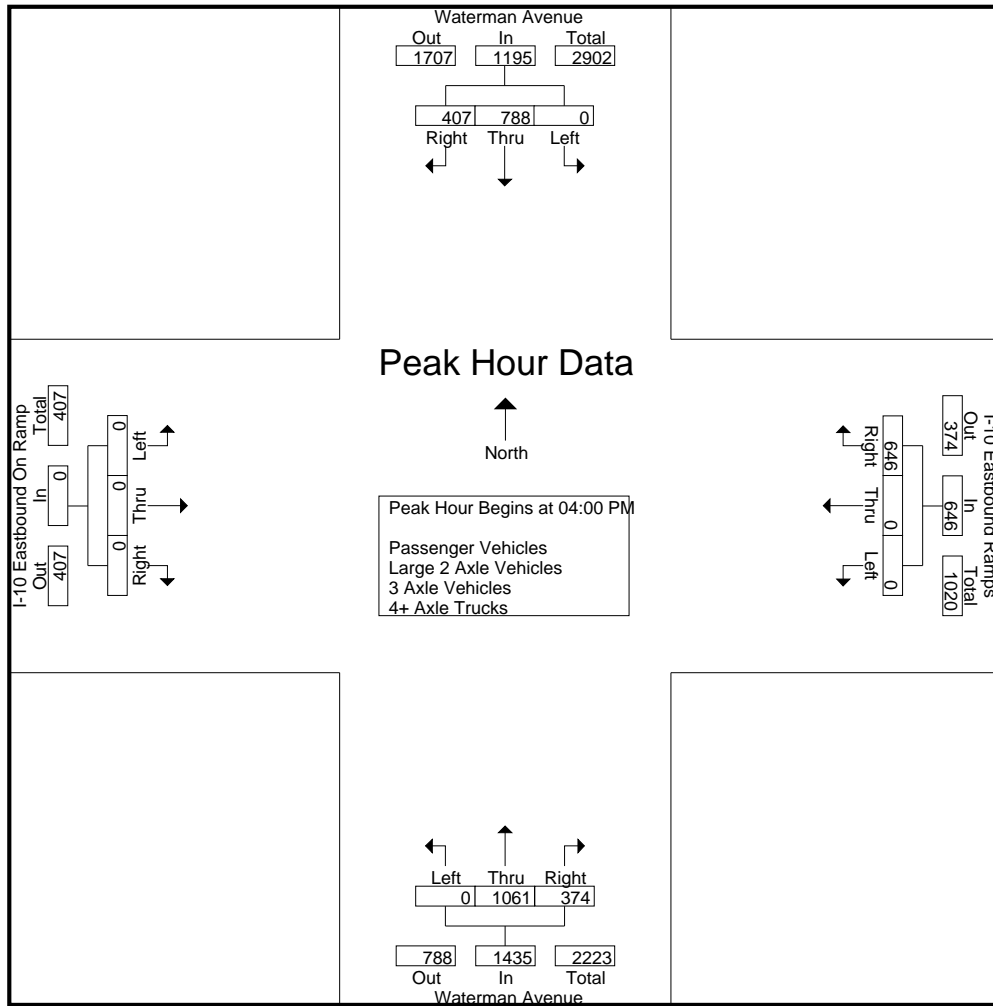
Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	Waterman Avenue Southbound				I-10 Eastbound Ramps Westbound				Waterman Avenue Northbound				I-10 Eastbound On Ramp Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	202	105	307	0	0	184	184	0	260	102	362	0	0	0	0	853
04:15 PM	0	212	95	307	0	0	156	156	0	270	89	359	0	0	0	0	822
04:30 PM	0	184	112	296	0	0	167	167	0	282	98	380	0	0	0	0	843
04:45 PM	0	190	95	285	0	0	139	139	0	249	85	334	0	0	0	0	758
Total	0	788	407	1195	0	0	646	646	0	1061	374	1435	0	0	0	0	3276
05:00 PM	0	246	111	357	0	0	127	127	0	255	90	345	0	0	0	0	829
05:15 PM	0	209	108	317	0	0	127	127	0	274	106	380	0	0	0	0	824
05:30 PM	0	202	93	295	0	0	150	150	0	280	91	371	0	0	0	0	816
05:45 PM	0	155	62	217	0	0	170	170	0	222	85	307	0	0	0	0	694
Total	0	812	374	1186	0	0	574	574	0	1031	372	1403	0	0	0	0	3163
Grand Total	0	1600	781	2381	0	0	1220	1220	0	2092	746	2838	0	0	0	0	6439
Apprch %	0	67.2	32.8		0	0	100		0	73.7	26.3		0	0	0		
Total %	0	24.8	12.1	37	0	0	18.9	18.9	0	32.5	11.6	44.1	0	0	0	0	
Passenger Vehicles	0	1569	769	2338	0	0	1188	1188	0	2050	717	2767	0	0	0	0	6293
% Passenger Vehicles	0	98.1	98.5	98.2	0	0	97.4	97.4	0	98	96.1	97.5	0	0	0	0	97.7
Large 2 Axle Vehicles	0	19	11	30	0	0	11	11	0	24	7	31	0	0	0	0	72
% Large 2 Axle Vehicles	0	1.2	1.4	1.3	0	0	0.9	0.9	0	1.1	0.9	1.1	0	0	0	0	1.1
3 Axle Vehicles	0	2	0	2	0	0	2	2	0	3	1	4	0	0	0	0	8
% 3 Axle Vehicles	0	0.1	0	0.1	0	0	0.2	0.2	0	0.1	0.1	0.1	0	0	0	0	0.1
4+ Axle Trucks	0	10	1	11	0	0	19	19	0	15	21	36	0	0	0	0	66
% 4+ Axle Trucks	0	0.6	0.1	0.5	0	0	1.6	1.6	0	0.7	2.8	1.3	0	0	0	0	1

Start Time	Waterman Avenue Southbound				I-10 Eastbound Ramps Westbound				Waterman Avenue Northbound				I-10 Eastbound On Ramp Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	202	105	307	0	0	184	184	0	260	102	362	0	0	0	0	853
04:15 PM	0	212	95	307	0	0	156	156	0	270	89	359	0	0	0	0	822
04:30 PM	0	184	112	296	0	0	167	167	0	282	98	380	0	0	0	0	843
04:45 PM	0	190	95	285	0	0	139	139	0	249	85	334	0	0	0	0	758
Total Volume	0	788	407	1195	0	0	646	646	0	1061	374	1435	0	0	0	0	3276
% App. Total	0	65.9	34.1		0	0	100		0	73.9	26.1		0	0	0		
PHF	.000	.929	.908	.973	.000	.000	.878	.878	.000	.941	.917	.944	.000	.000	.000	.000	.960

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Eastbound Ramps
 Weather: Clear

File Name : 13-SBCWT10EPM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:30 PM				04:00 PM				04:30 PM				04:00 PM			
+0 mins.	0	184	112	296	0	0	184	184	0	282	98	380	0	0	0	0
+15 mins.	0	190	95	285	0	0	156	156	0	249	85	334	0	0	0	0
+30 mins.	0	246	111	357	0	0	167	167	0	255	90	345	0	0	0	0
+45 mins.	0	209	108	317	0	0	139	139	0	274	106	380	0	0	0	0
Total Volume	0	829	426	1255	0	0	646	646	0	1060	379	1439	0	0	0	0
% App. Total	0	66.1	33.9		0	0	100		0	73.7	26.3		0	0	0	
PHF	.000	.842	.951	.879	.000	.000	.878	.878	.000	.940	.894	.947	.000	.000	.000	.000

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Eastbound Ramps
 Weather: Clear

File Name : 13-SBCWT10EPM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 1

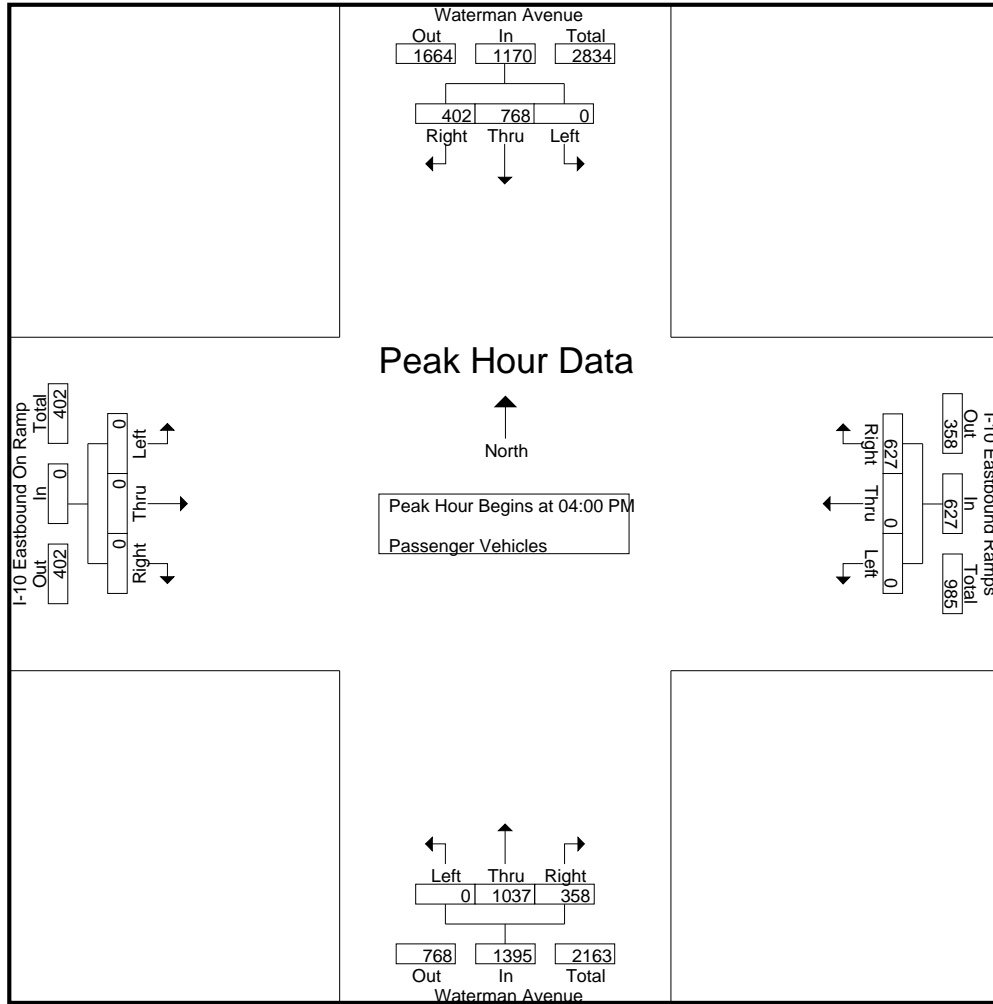
Groups Printed- Passenger Vehicles

Start Time	Waterman Avenue Southbound				I-10 Eastbound Ramps Westbound				Waterman Avenue Northbound				I-10 Eastbound On Ramp Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	197	104	301	0	0	177	177	0	254	99	353	0	0	0	0	831
04:15 PM	0	208	94	302	0	0	153	153	0	265	86	351	0	0	0	0	806
04:30 PM	0	178	110	288	0	0	163	163	0	275	94	369	0	0	0	0	820
04:45 PM	0	185	94	279	0	0	134	134	0	243	79	322	0	0	0	0	735
Total	0	768	402	1170	0	0	627	627	0	1037	358	1395	0	0	0	0	3192
05:00 PM	0	242	111	353	0	0	125	125	0	247	86	333	0	0	0	0	811
05:15 PM	0	207	104	311	0	0	126	126	0	269	103	372	0	0	0	0	809
05:30 PM	0	200	92	292	0	0	149	149	0	279	88	367	0	0	0	0	808
05:45 PM	0	152	60	212	0	0	161	161	0	218	82	300	0	0	0	0	673
Total	0	801	367	1168	0	0	561	561	0	1013	359	1372	0	0	0	0	3101
Grand Total	0	1569	769	2338	0	0	1188	1188	0	2050	717	2767	0	0	0	0	6293
Apprch %	0	67.1	32.9		0	0	100		0	74.1	25.9		0	0	0		
Total %	0	24.9	12.2	37.2	0	0	18.9	18.9	0	32.6	11.4	44	0	0	0	0	

Start Time	Waterman Avenue Southbound				I-10 Eastbound Ramps Westbound				Waterman Avenue Northbound				I-10 Eastbound On Ramp Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	197	104	301	0	0	177	177	0	254	99	353	0	0	0	0	831
04:15 PM	0	208	94	302	0	0	153	153	0	265	86	351	0	0	0	0	806
04:30 PM	0	178	110	288	0	0	163	163	0	275	94	369	0	0	0	0	820
04:45 PM	0	185	94	279	0	0	134	134	0	243	79	322	0	0	0	0	735
Total Volume	0	768	402	1170	0	0	627	627	0	1037	358	1395	0	0	0	0	3192
% App. Total	0	65.6	34.4		0	0	100		0	74.3	25.7		0	0	0		
PHF	.000	.923	.914	.969	.000	.000	.886	.886	.000	.943	.904	.945	.000	.000	.000	.000	.960

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Eastbound Ramps
 Weather: Clear

File Name : 13-SBCWT10EPM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
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Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	197	104	301	0	0	177	177	0	254	99	353	0	0	0	0
+15 mins.	0	208	94	302	0	0	153	153	0	265	86	351	0	0	0	0
+30 mins.	0	178	110	288	0	0	163	163	0	275	94	369	0	0	0	0
+45 mins.	0	185	94	279	0	0	134	134	0	243	79	322	0	0	0	0
Total Volume	0	768	402	1170	0	0	627	627	0	1037	358	1395	0	0	0	0
% App. Total	0	65.6	34.4		0	0	100		0	74.3	25.7		0	0	0	0
PHF	.000	.923	.914	.969	.000	.000	.886	.886	.000	.943	.904	.945	.000	.000	.000	.000

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Eastbound Ramps
 Weather: Clear

File Name : 13-SBCWT10EPM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 1

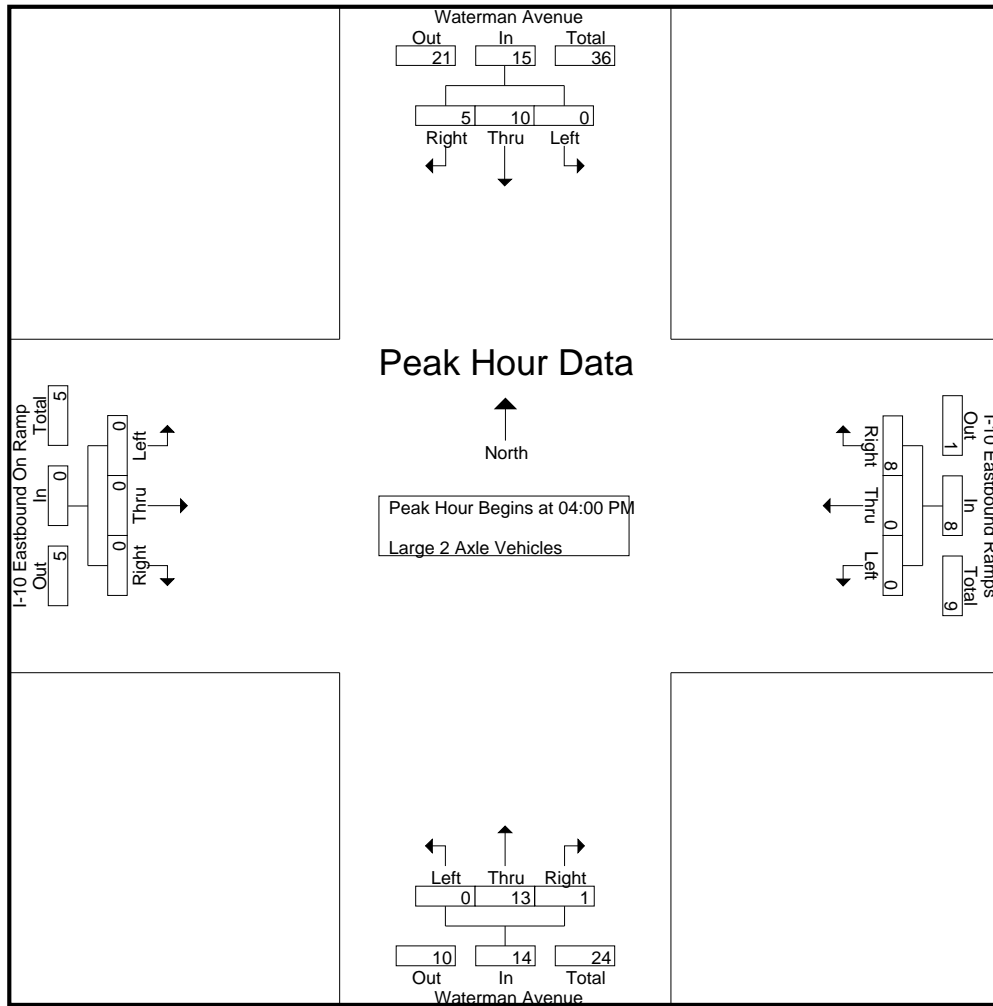
Groups Printed- Large 2 Axle Vehicles

Start Time	Waterman Avenue Southbound				I-10 Eastbound Ramps Westbound				Waterman Avenue Northbound				I-10 Eastbound On Ramp Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	1	1	2	0	0	4	4	0	2	1	3	0	0	0	0	9
04:15 PM	0	2	1	3	0	0	0	0	0	3	0	3	0	0	0	0	6
04:30 PM	0	4	2	6	0	0	3	3	0	3	0	3	0	0	0	0	12
04:45 PM	0	3	1	4	0	0	1	1	0	5	0	5	0	0	0	0	10
Total	0	10	5	15	0	0	8	8	0	13	1	14	0	0	0	0	37
05:00 PM	0	3	0	3	0	0	0	0	0	5	3	8	0	0	0	0	11
05:15 PM	0	1	4	5	0	0	0	0	0	2	1	3	0	0	0	0	8
05:30 PM	0	2	1	3	0	0	0	0	0	1	1	2	0	0	0	0	5
05:45 PM	0	3	1	4	0	0	3	3	0	3	1	4	0	0	0	0	11
Total	0	9	6	15	0	0	3	3	0	11	6	17	0	0	0	0	35
Grand Total	0	19	11	30	0	0	11	11	0	24	7	31	0	0	0	0	72
Apprch %	0	63.3	36.7		0	0	100		0	77.4	22.6		0	0	0		
Total %	0	26.4	15.3	41.7	0	0	15.3	15.3	0	33.3	9.7	43.1	0	0	0	0	

Start Time	Waterman Avenue Southbound				I-10 Eastbound Ramps Westbound				Waterman Avenue Northbound				I-10 Eastbound On Ramp Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	1	1	2	0	0	4	4	0	2	1	3	0	0	0	0	9
04:15 PM	0	2	1	3	0	0	0	0	0	3	0	3	0	0	0	0	6
04:30 PM	0	4	2	6	0	0	3	3	0	3	0	3	0	0	0	0	12
04:45 PM	0	3	1	4	0	0	1	1	0	5	0	5	0	0	0	0	10
Total Volume	0	10	5	15	0	0	8	8	0	13	1	14	0	0	0	0	37
% App. Total	0	66.7	33.3		0	0	100		0	92.9	7.1		0	0	0		
PHF	.000	.625	.625	.625	.000	.000	.500	.500	.000	.650	.250	.700	.000	.000	.000	.000	.771

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Eastbound Ramps
 Weather: Clear

File Name : 13-SBCWT10EPM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 2



Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	1	1	2	0	0	4	4	0	2	1	3	0	0	0	0
+15 mins.	0	2	1	3	0	0	0	0	0	3	0	3	0	0	0	0
+30 mins.	0	4	2	6	0	0	3	3	0	3	0	3	0	0	0	0
+45 mins.	0	3	1	4	0	0	1	1	0	5	0	5	0	0	0	0
Total Volume	0	10	5	15	0	0	8	8	0	13	1	14	0	0	0	0
% App. Total	0	66.7	33.3		0	0	100		0	92.9	7.1		0	0	0	
PHF	.000	.625	.625	.625	.000	.000	.500	.500	.000	.650	.250	.700	.000	.000	.000	.000

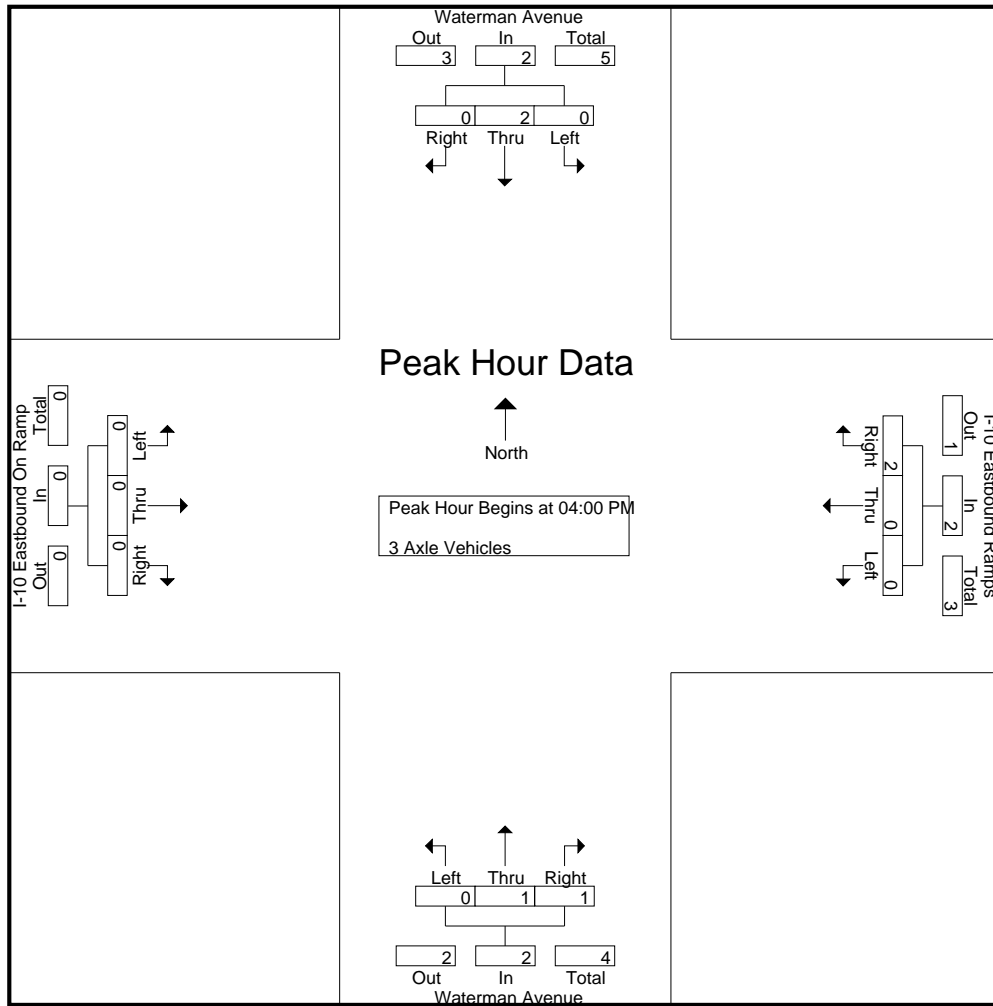
City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Eastbound Ramps
 Weather: Clear

File Name : 13-SBCWT10EPM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 1

Groups Printed- 3 Axle Vehicles

Start Time	Waterman Avenue Southbound				I-10 Eastbound Ramps Westbound				Waterman Avenue Northbound				I-10 Eastbound On Ramp Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
04:15 PM	0	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0	2
04:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	2
Total	0	2	0	2	0	0	2	2	0	1	1	2	0	0	0	0	6
05:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	2
Grand Total	0	2	0	2	0	0	2	2	0	3	1	4	0	0	0	0	8
Apprch %	0	100	0		0	0	100		0	75	25		0	0	0		
Total %	0	25	0	25	0	0	25	25	0	37.5	12.5	50	0	0	0	0	

Start Time	Waterman Avenue Southbound				I-10 Eastbound Ramps Westbound				Waterman Avenue Northbound				I-10 Eastbound On Ramp Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
04:15 PM	0	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0	2
04:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	2
Total Volume	0	2	0	2	0	0	2	2	0	1	1	2	0	0	0	0	6
% App. Total	0	100	0		0	0	100		0	50	50		0	0	0		
PHF	.000	.500	.000	.500	.000	.000	.250	.250	.000	.250	.250	.500	.000	.000	.000	.000	.750



Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
+15 mins.	0	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0
+30 mins.	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0
Total Volume	0	2	0	2	0	0	2	2	0	1	1	2	0	0	0	0
% App. Total	0	100	0	0	0	0	100	0	0	50	50	0	0	0	0	0
PHF	.000	.500	.000	.500	.000	.000	.250	.250	.000	.250	.250	.500	.000	.000	.000	.000

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Eastbound Ramps
 Weather: Clear

File Name : 13-SBCWT10EPM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 1

Groups Printed- 4+ Axle Trucks

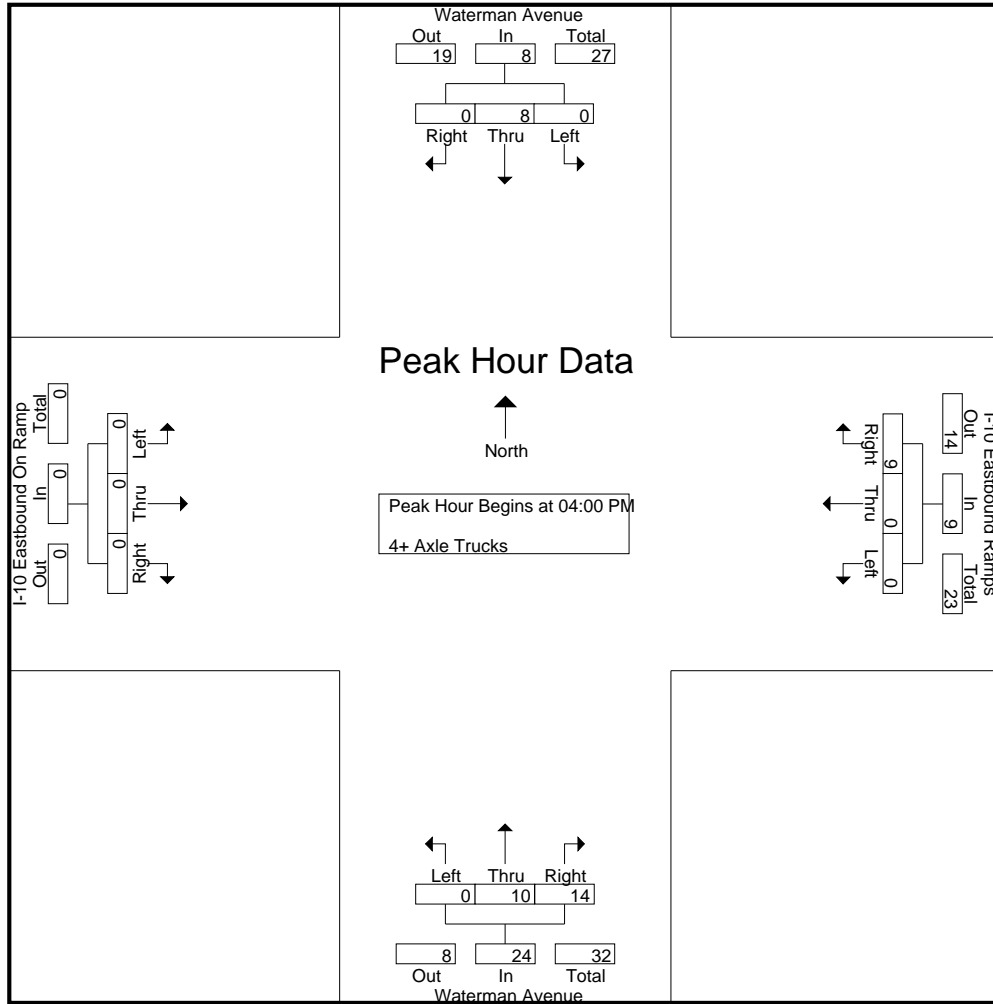
Start Time	Waterman Avenue Southbound				I-10 Eastbound Ramps Westbound				Waterman Avenue Northbound				I-10 Eastbound On Ramp Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	4	0	4	0	0	3	3	0	3	2	5	0	0	0	0	12
04:15 PM	0	1	0	1	0	0	3	3	0	2	2	4	0	0	0	0	8
04:30 PM	0	1	0	1	0	0	1	1	0	4	4	8	0	0	0	0	10
04:45 PM	0	2	0	2	0	0	2	2	0	1	6	7	0	0	0	0	11
Total	0	8	0	8	0	0	9	9	0	10	14	24	0	0	0	0	41
05:00 PM	0	1	0	1	0	0	2	2	0	2	1	3	0	0	0	0	6
05:15 PM	0	1	0	1	0	0	1	1	0	2	2	4	0	0	0	0	6
05:30 PM	0	0	0	0	0	0	1	1	0	0	2	2	0	0	0	0	3
05:45 PM	0	0	1	1	0	0	6	6	0	1	2	3	0	0	0	0	10
Total	0	2	1	3	0	0	10	10	0	5	7	12	0	0	0	0	25
Grand Total	0	10	1	11	0	0	19	19	0	15	21	36	0	0	0	0	66
Apprch %	0	90.9	9.1		0	0	100		0	41.7	58.3		0	0	0		
Total %	0	15.2	1.5	16.7	0	0	28.8	28.8	0	22.7	31.8	54.5	0	0	0	0	

Start Time	Waterman Avenue Southbound				I-10 Eastbound Ramps Westbound				Waterman Avenue Northbound				I-10 Eastbound On Ramp Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	0	4	0	4	0	0	3	3	0	3	2	5	0	0	0	0	12
04:15 PM	0	1	0	1	0	0	3	3	0	2	2	4	0	0	0	0	8
04:30 PM	0	1	0	1	0	0	1	1	0	4	4	8	0	0	0	0	10
04:45 PM	0	2	0	2	0	0	2	2	0	1	6	7	0	0	0	0	11
Total Volume	0	8	0	8	0	0	9	9	0	10	14	24	0	0	0	0	41
% App. Total	0	100	0		0	0	100		0	41.7	58.3		0	0	0		
PHF	.000	.500	.000	.500	.000	.000	.750	.750	.000	.625	.583	.750	.000	.000	.000	.000	.854

Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:00 PM

City of San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Eastbound Ramps
 Weather: Clear

File Name : 13-SBCWT10EPM REDO
 Site Code : 05117141
 Start Date : 3/14/2017
 Page No : 2



Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	4	0	4	0	0	3	3	0	3	2	5	0	0	0	0
+15 mins.	0	1	0	1	0	0	3	3	0	2	2	4	0	0	0	0
+30 mins.	0	1	0	1	0	0	1	1	0	4	4	8	0	0	0	0
+45 mins.	0	2	0	2	0	0	2	2	0	1	6	7	0	0	0	0
Total Volume	0	8	0	8	0	0	9	9	0	10	14	24	0	0	0	0
% App. Total	0	100	0	0	0	0	100	0	0	41.7	58.3	0	0	0	0	0
PHF	.000	.500	.000	.500	.000	.000	.750	.750	.000	.625	.583	.750	.000	.000	.000	.000

Location: San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Eastbound Ramps



Date: 3/14/2017
 Day: Tuesday

PEDESTRIANS

	North Leg Waterman Avenue	East Leg I-10 Eastbound Ramps	South Leg Waterman Avenue	West Leg I-10 Eastbound Ramps	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	1	0	0	1
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	2	2
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	0	1	0	2	3

	North Leg Waterman Avenue	East Leg I-10 Eastbound Ramps	South Leg Waterman Avenue	West Leg I-10 Eastbound Ramps	TOTAL
4:00 PM	0	1	0	2	3
4:15 PM	0	1	0	0	1
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	3	3
5:15 PM	0	1	0	0	1
5:30 PM	0	3	0	0	3
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	6	0	5	11

Location: San Bernardino
 N/S: Waterman Avenue
 E/W: I-10 Eastbound Ramps



Date: 3/14/2017
 Day: Tuesday

BICYCLES

	North Leg Waterman Avenue	East Leg I-10 Eastbound Ramps	South Leg Waterman Avenue	West Leg I-10 Eastbound Ramps	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	1	0	1	2
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	1	0	0	1
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	1	1
TOTAL VOLUMES:	0	2	0	2	4

	North Leg Waterman Avenue	East Leg I-10 Eastbound Ramps	South Leg Waterman Avenue	West Leg I-10 Eastbound Ramps	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	1	0	0	1
4:45 PM	0	0	0	0	0
5:00 PM	0	1	0	0	1
5:15 PM	0	1	0	0	1
5:30 PM	0	0	1	1	2
5:45 PM	0	1	0	0	1
TOTAL VOLUMES:	0	4	1	1	6

Counts Unlimited
 PO Box 1178
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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 14-SBCWSTREAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	Waterman Avenue Southbound						Redlands Boulevard Westbound						Waterman Avenue Northbound						Redlands Boulevard Eastbound									
	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total				
07:00 AM	8	75	19	2	102	57	19	31	7	2	57	221	8	189	24	6	221	90	49	53	11	192	21	572	593			
07:15 AM	18	65	35	16	118	59	16	21	22	5	59	226	7	203	16	7	226	87	82	62	8	231	36	634	670			
07:30 AM	19	78	37	18	134	89	24	42	23	3	89	248	10	199	39	14	248	101	83	68	19	252	54	723	777			
07:45 AM	21	114	48	18	183	119	28	63	28	5	119	196	8	162	26	14	196	104	103	47	5	254	42	752	794			
Total	66	332	139	54	537	324	87	157	80	15	324	891	33	753	105	41	891	382	317	230	43	929	153	2681	2834			
08:00 AM	17	90	39	12	146	114	25	55	34	11	114	226	9	199	18	6	226	105	86	52	19	243	48	729	777			
08:15 AM	14	102	38	5	154	84	24	47	13	5	84	190	12	157	21	6	190	111	87	54	9	252	25	680	705			
08:30 AM	13	108	28	5	149	97	27	42	28	7	97	229	8	199	22	11	229	106	71	39	3	216	26	691	717			
08:45 AM	25	62	28	10	115	97	36	40	21	9	97	199	17	156	26	10	199	109	88	52	6	249	35	660	695			
Total	69	362	133	32	564	392	112	184	96	32	392	844	46	711	87	33	844	431	332	197	37	960	134	2760	2894			
Grand Total	135	694	272	86	1101	716	199	341	176	47	716	1735	79	1464	192	74	1735	813	649	427	80	1889	287	5441	5728			
Approach %	12.3	63	24.7				27.8	47.6	24.6			4.6	84.4	11.1			43	34.4	22.6			5	95					
Total %	2.5	12.8	5		20.2	13.2	3.7	6.3	3.2		13.2	1.5	26.9	3.5		31.9	14.9	11.9	7.8		34.7	0	0	0	0	0	5536	96.6
% Passenger Vehicles	133	677	256		1149	736	192	324	174		736	77	1416	188		1755	769	635	414		1896	0	0	0	0	0	5536	96.6
% Large 2 Axle Vehicles	98.5	97.6	94.1		96.8	96.5	96.5	95	98.9		97.9	97.5	96.7	97.9		100	97	94.6	97.8		97.5	96.3	97.0	96.3	96.3	96.3	96.6	96.6
% 3 Axle Vehicles	0.7	2	1.8		1.8	1.3	2	2.3	0.6		1.7	1.3	1.3	0.5		0	2.1	1.4	1.2		1.2	1.6	0	0	0	0	1.5	1.5
% 4+ Axle Trucks	0	0.3	3.7		2.3	1.2	1	2.1	0		0	1.3	1.9	0.5		0	3.1	0.6	1.4		1.2	1.8	0	0	0	0	1.6	1.6

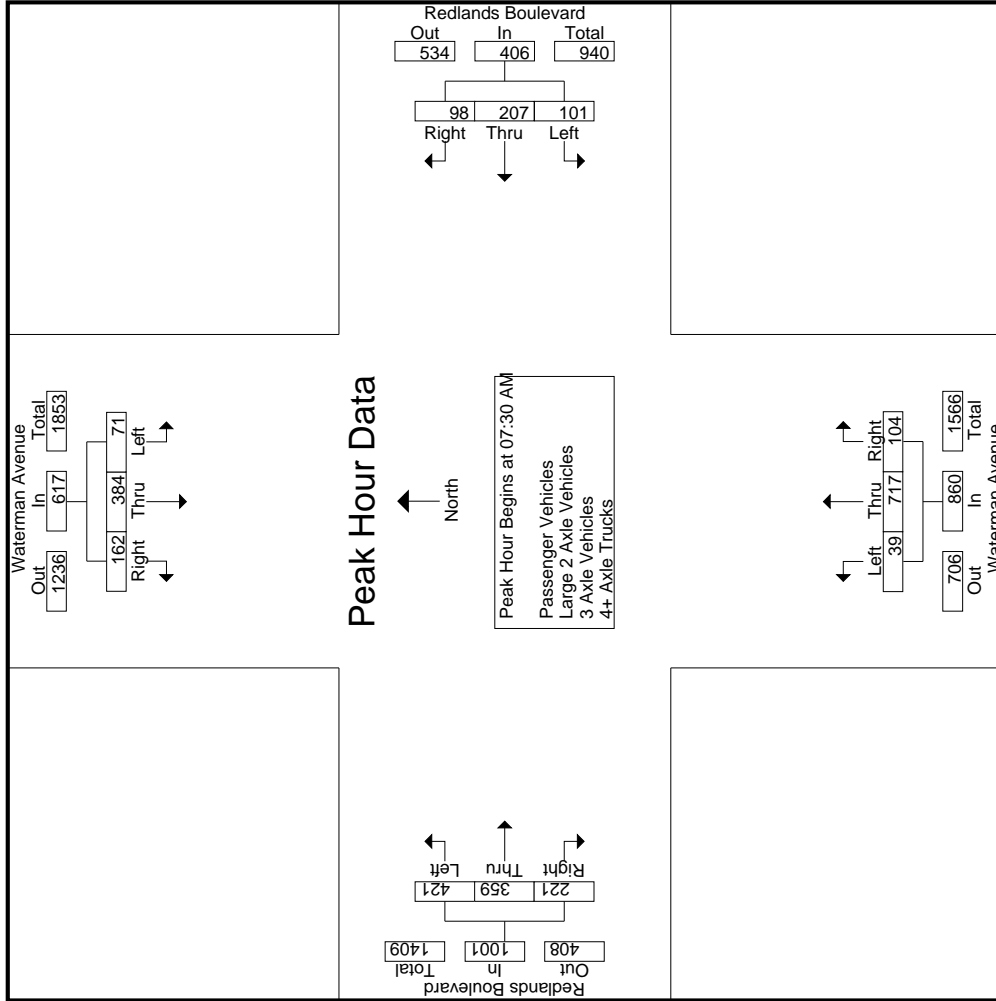
Start Time	Waterman Avenue Southbound						Redlands Boulevard Westbound						Waterman Avenue Northbound						Redlands Boulevard Eastbound							
	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total		
07:30 AM	19	78	37		134		24	42			89		10	199			39		101	83			248		68	252
07:45 AM	21	114	48		183		28	63			119		8	162			26		104	103			196		47	254
08:00 AM	17	90	38		146		25	55			114		9	199			18		105	86			226		52	243
08:15 AM	14	102	38		154		24	47			84		12	157			21		111	87			190		54	252
Total Volume	71	384	162		617		101	207			406		39	717			104		421	359			860		221	1001
% App. Total	11.5	62.2	26.3		26.3		24.9	51			12.1		4.5	83.4			12.1		42.1	35.9			35.9		22.1	98.5
PHF	.845	.842	.844		.843		.902	.821			.853		.813	.901			.667		.948	.871			.867		.813	.985

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:30 AM

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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 14-SBCWSTREAM
 Site Code : 05117141
 Start Date : 3/2/2017
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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 14-SBCWSTREAM
 Site Code : 05117141
 Start Date : 3/2/2017
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Start Time	Waterman Avenue Southbound			Redlands Boulevard Westbound			Waterman Avenue Northbound			Redlands Boulevard Eastbound			App. Total	Int. Total		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right				
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1	Peak Hour for Each Approach Begins at:															
	07:45 AM															
+0 mins.	21	114	48	183	28	63	28	119	7	203	16	226	101	83	68	252
+15 mins.	17	90	39	146	25	55	34	114	10	199	39	248	104	103	47	254
+30 mins.	14	102	38	154	24	47	13	84	8	162	26	196	105	86	52	243
+45 mins.	13	108	28	149	27	42	28	97	9	199	18	226	111	87	54	252
Total Volume	65	414	153	632	104	207	103	414	34	763	99	896	421	359	221	1001
% App. Total	10.3	65.5	24.2	86.3	25.1	50	24.9	85.2	3.8	85.2	11	903	42.1	35.9	22.1	985
PHF	.774	.908	.797	.863	.929	.821	.757	.870	.850	.940	.635	.903	.948	.871	.813	.985

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City of San Bernardino
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 Start Date : 3/2/2017
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Groups Printed- Passenger Vehicles

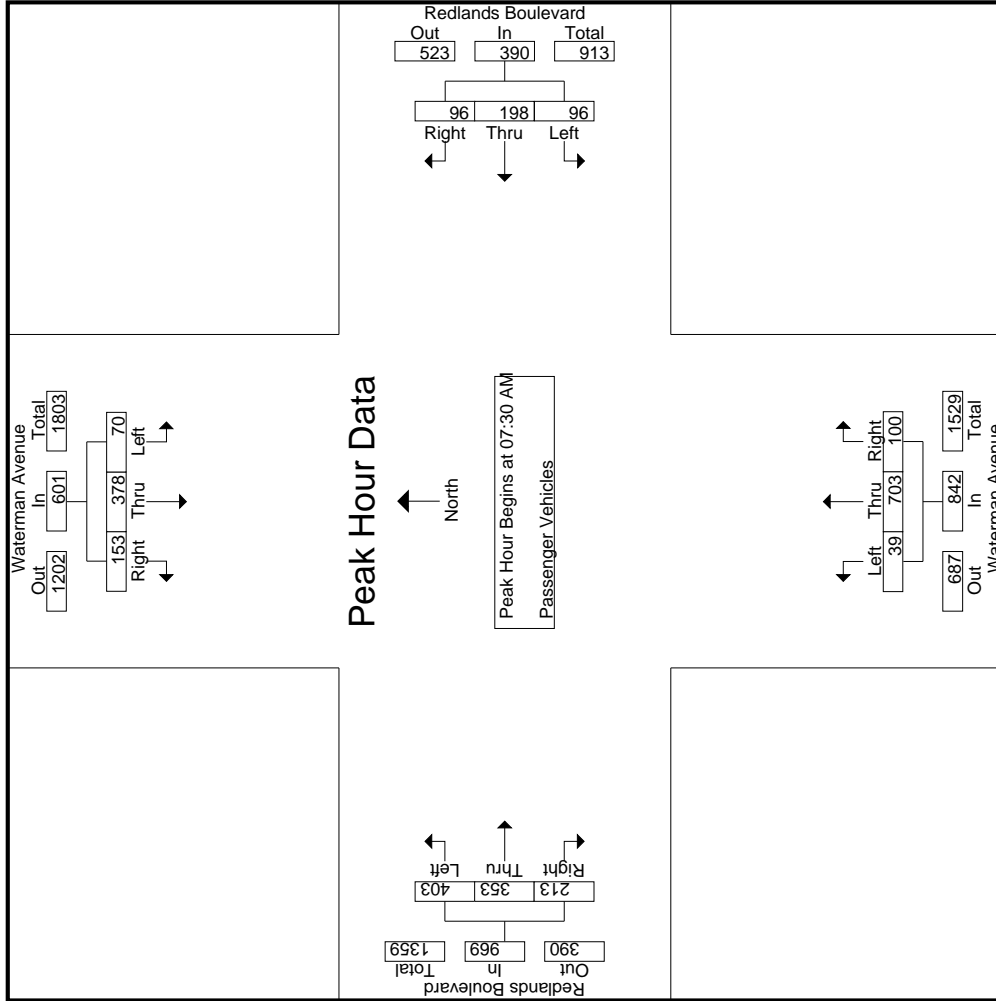
Start Time	Waterman Avenue Southbound					Redlands Boulevard Westbound					Waterman Avenue Northbound					Redlands Boulevard Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	8	72	19	2	99	19	30	7	2	56	7	181	24	6	212	84	47	52	11	183	21	550	571
07:15 AM	17	63	35	16	115	16	19	22	5	57	6	193	16	7	215	80	81	62	8	223	36	610	646
07:30 AM	19	77	36	18	132	23	40	23	3	86	10	194	38	14	242	97	81	65	18	243	53	703	756
07:45 AM	21	112	45	18	178	27	62	27	5	116	8	159	26	14	193	100	102	47	5	249	42	736	778
Total	65	324	135	54	524	85	151	79	15	315	31	727	104	41	862	361	311	226	42	898	152	2599	2751
08:00 AM	17	89	38	12	144	24	54	33	10	111	9	194	17	6	220	101	84	50	19	235	47	710	757
08:15 AM	13	100	34	4	147	22	42	13	5	77	12	156	19	6	187	105	86	51	8	242	23	653	676
08:30 AM	13	104	27	4	144	26	39	28	7	93	8	187	22	11	217	99	68	38	3	205	25	659	684
08:45 AM	25	60	22	9	107	35	38	21	9	94	17	152	26	10	195	103	86	49	6	238	34	634	668
Total	68	353	121	29	542	107	173	95	31	375	46	689	84	33	819	408	324	188	36	920	129	2656	2785
Grand Total	133	677	256	83	1066	192	324	174	46	690	77	1416	188	74	1681	769	635	414	78	1818	281	5255	5536
Approch %	12.5	63.5	24			27.8	47	25.2			4.6	84.2	11.2		42.3	34.9	22.8						
Total %	2.5	12.9	4.9		20.3	3.7	6.2	3.3		13.1	1.5	26.9	3.6		14.6	12.1	7.9				5.1	94.9	

Start Time	Waterman Avenue Southbound					Redlands Boulevard Westbound					Waterman Avenue Northbound					Redlands Boulevard Eastbound								
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																								
Peak Hour for Entire Intersection Begins at 07:30 AM																								
07:30 AM	19	77	36		132	23	40	23		86	10	194	38		242	97	81	65		243			703	
07:45 AM	21	112	45		178	27	62	27		116	8	159	26		193	100	102	47		249			736	
08:00 AM	17	89	38		144	24	54	33		111	9	194	17		220	101	84	50		235			710	
08:15 AM	13	100	34		144	26	39	28		93	8	187	22		187	105	86	51		242			653	
Total Volume	70	378	153		601	96	198	96		390	39	703	100		842	403	353	213		969			2802	
% App. Total	11.6	62.9	25.5			24.6	50.8	24.6			4.6	83.5	11.9		41.6	36.4	22							
PHF	.833	.844	.850		.844	.889	.798	.727		.841	.813	.906	.658		.870	.960	.865	.819		.973			.952	

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City of San Bernardino
 N/S: Waterman Avenue
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File Name : 14-SBCWSTREAM
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City of San Bernardino
 N/S: Waterman Avenue
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File Name : 14-SBCWSTREAM
 Site Code : 05117141
 Start Date : 3/2/2017
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Start Time	Waterman Avenue Southbound			Redlands Boulevard Westbound			Waterman Avenue Northbound			Redlands Boulevard Eastbound			App. Total	Int. Total	
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right			
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1	Peak Hour for Each Approach Begins at:														
	07:30 AM														
+0 mins.	19	77	36	23	40	23	86	10	194	38	97	81	65	243	
+15 mins.	21	112	45	27	62	27	116	8	159	26	100	102	47	249	
+30 mins.	17	89	38	24	54	33	111	9	194	17	101	84	50	235	
+45 mins.	13	100	34	22	42	13	77	12	156	19	105	86	51	242	
Total Volume	70	378	153	96	198	96	390	39	703	100	403	353	213	969	
% App. Total	11.6	62.9	25.5	24.6	50.8	24.6	84.1	4.6	83.5	11.9	41.6	36.4	22	97.3	
PHF	.833	.844	.850	.889	.798	.727	.841	.813	.906	.658	.960	.865	.819		

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City of San Bernardino
 N/S: Waterman Avenue
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File Name : 14-SBCWSTREAM
 Site Code : 05117141
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Groups Printed- Large 2 Axle Vehicles

Start Time	Waterman Avenue Southbound					Redlands Boulevard Westbound					Waterman Avenue Northbound					Redlands Boulevard Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	1	2	1	0	4	0	8	8
07:15 AM	0	1	0	0	1	0	1	0	0	1	1	6	0	0	7	5	0	0	0	5	0	14	14
07:30 AM	0	1	0	0	1	1	1	0	0	2	0	3	0	0	3	0	2	1	4	4	1	10	11
07:45 AM	0	1	0	0	1	1	0	1	0	2	0	1	0	0	1	2	1	0	0	3	0	7	7
Total	0	5	0	0	5	2	2	1	0	5	1	12	0	0	13	8	5	3	1	16	1	39	40
08:00 AM	0	1	1	0	2	0	0	0	0	0	0	1	0	0	1	2	0	0	0	2	0	5	5
08:15 AM	1	2	1	1	4	1	3	0	0	4	0	0	1	0	1	4	1	2	0	7	1	16	17
08:30 AM	0	4	0	0	4	0	3	0	0	3	0	5	0	0	5	2	2	0	0	4	0	16	16
08:45 AM	0	2	3	0	5	1	0	0	0	1	0	1	0	0	1	1	1	0	0	2	0	9	9
Total	1	9	5	1	15	2	6	0	0	8	0	7	1	0	8	9	4	2	0	15	1	46	47
Grand Total	1	14	5	1	20	4	8	1	0	13	1	19	1	0	21	17	9	5	1	31	2	85	87
Approch %	5	70	25		30.8	61.5	7.7			15.3	4.8	90.5	4.8		24.7	54.8	29	16.1		36.5	2.3	97.7	
Total %	1.2	16.5	5.9		23.5	4.7	9.4	1.2		15.3	1.2	22.4	1.2		24.7	20	10.6	5.9					

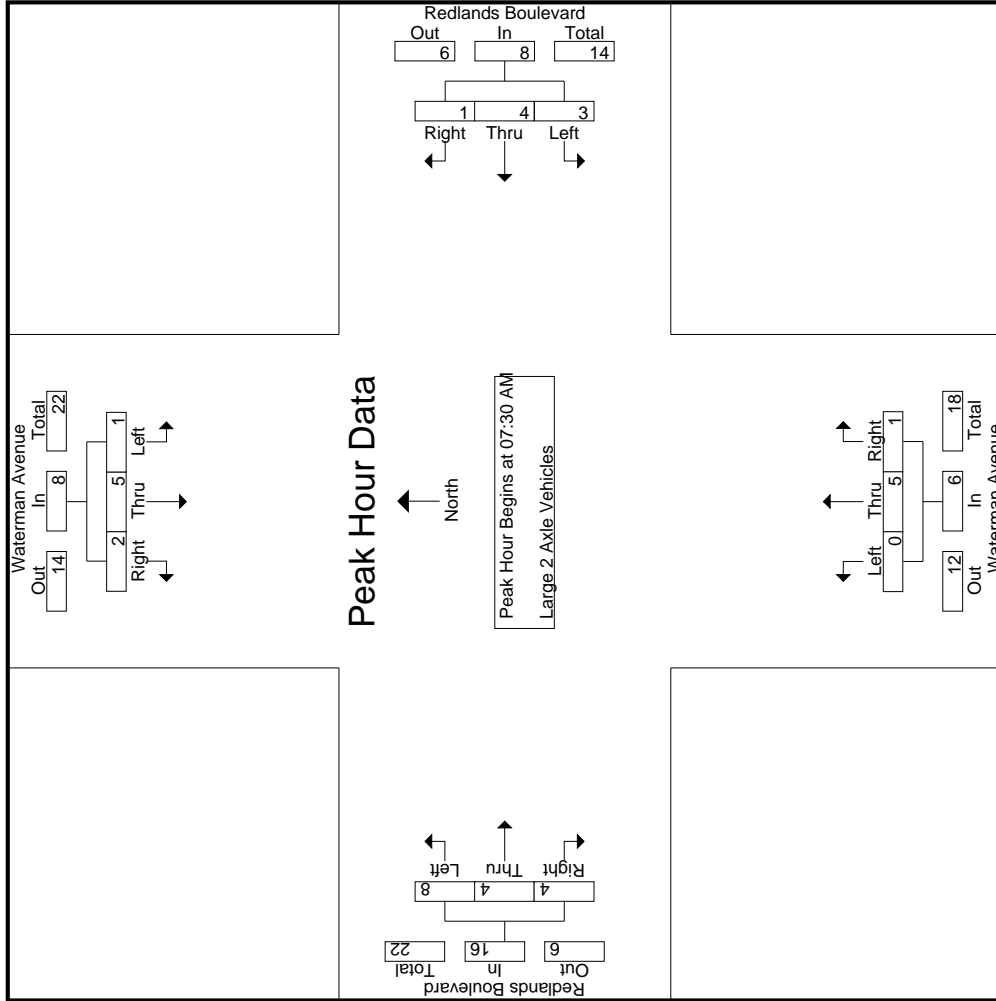
Start Time	Waterman Avenue Southbound					Redlands Boulevard Westbound					Waterman Avenue Northbound					Redlands Boulevard Eastbound						
	Left	Thru	Right	App. Total	Int. Total	Left	Thru	Right	App. Total	Int. Total	Left	Thru	Right	App. Total	Int. Total	Left	Thru	Right	App. Total	Int. Total		
07:30 AM	0	1	0	1	1	1	1	0	2	0	0	3	0	0	3	0	2	2	4	4	10	
07:45 AM	0	1	0	1	1	1	0	0	2	0	0	1	0	1	1	2	1	0	3	3	7	
08:00 AM	0	1	1	2	2	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2	5	
08:15 AM	1	2	1	4	4	1	1	3	4	4	0	0	0	1	1	4	1	2	7	7	16	
Total Volume	1	5	2	8	8	3	4	1	8	1	0	5	1	6	6	8	4	4	16	16	38	
% App. Total	12.5	62.5	25			37.5	50	12.5			0	83.3	16.7			50	25	25				
PHF	.250	.625	.500	.500	.500	.750	.333	.250	.500	.250	.000	.417	.250	.500	.500	.500	.500	.500	.500	.500	.571	.594

Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:30 AM

Counts Unlimited
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City of San Bernardino
 N/S: Waterman Avenue
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File Name : 14-SBCWSTREAM
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City of San Bernardino
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Start Time	Waterman Avenue Southbound			Redlands Boulevard Westbound			Waterman Avenue Northbound			Redlands Boulevard Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	07:30 AM													
+0 mins.	0	1	0	1	1	0	0	0	3	0	0	2	3	4
+15 mins.	0	1	0	1	0	1	0	0	1	0	0	2	1	3
+30 mins.	0	1	1	0	0	0	0	0	1	0	0	0	0	2
+45 mins.	1	2	1	1	3	0	0	0	0	1	4	1	2	7
Total Volume	1	5	2	3	4	1	0	0	5	1	6	8	4	16
% App. Total	12.5	62.5	25	37.5	50	12.5	0	0	83.3	16.7	50	25	25	100
PHF	.250	.625	.500	.750	.333	.250	.000	.417	.250	.500	.500	.500	.500	.571

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City of San Bernardino
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 Weather: Clear

File Name : 14-SBCWSTREAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 3 Axle Vehicles

Start Time	Waterman Avenue Southbound					Redlands Boulevard Westbound					Waterman Avenue Northbound					Redlands Boulevard Eastbound								
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	2	2
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
07:45 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	2	2
Total	1	1	0	0	2	0	0	0	0	0	1	1	0	0	2	0	0	1	0	0	0	0	5	5
08:00 AM	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	2	3
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
08:45 AM	0	0	1	0	1	0	2	0	0	2	0	0	0	0	0	2	0	2	0	4	0	0	7	7
Total	0	0	1	0	1	1	2	1	1	4	0	0	0	1	0	2	0	2	0	4	1	10	10	11
Grand Total	1	1	1	0	3	1	2	1	1	4	0	1	2	0	3	2	1	2	0	5	1	15	15	16
Approach %	33.3	33.3	33.3			25	50	25			0	33.3	66.7		20	40	20	40		33.3	6.2	93.8		
Total %	6.7	6.7	6.7			6.7	13.3	6.7		26.7	0	6.7	13.3			13.3	6.7	13.3						

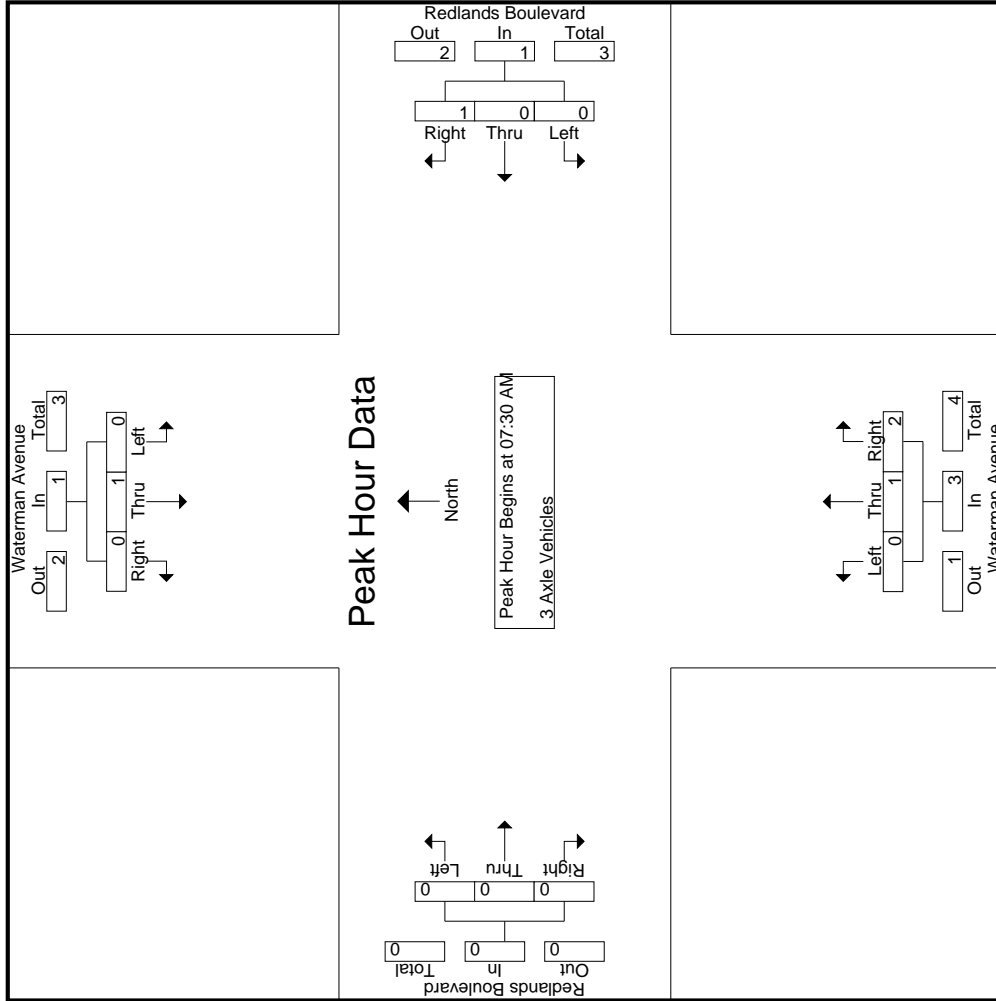
Start Time	Waterman Avenue Southbound					Redlands Boulevard Westbound					Waterman Avenue Northbound					Redlands Boulevard Eastbound								
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	100	0	0	100	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.250	.000		.250	.000	.000	.000		.250	.000	.000	.250		.500	.000	.750	.000		.000	.000	.625		

Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:30 AM

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 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 14-SBCWSTREAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



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File Name : 14-SBCWSTREAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Redlands Boulevard
 Weather: Clear

Start Time	Waterman Avenue Southbound			Redlands Boulevard Westbound			Waterman Avenue Northbound			Redlands Boulevard Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	07:30 AM													
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	1	0	0	0	0	0	0	1	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	0	0	0	0	0	0	1	2	0	0	0	0
% App. Total	0	100	0	0	0	0	100	0	33.3	66.7	0	0	0	0
PHF	.000	.250	.000	.000	.000	.250	.000	.250	.500	.750	.000	.000	.000	.000

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 PO Box 1178
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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 14-SBCWSTREAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 4+ Axle Trucks

Start Time	Waterman Avenue Southbound					Redlands Boulevard Westbound					Waterman Avenue Northbound					Redlands Boulevard Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	1	0	0	1	0	1	0	0	1	1	6	0	0	7	5	0	0	0	5	0	14	14
07:15 AM	0	1	0	0	1	0	1	0	0	1	0	4	0	0	4	2	0	0	2	0	0	8	8
07:30 AM	0	0	1	0	1	0	1	0	0	1	0	2	0	0	2	4	0	1	0	5	0	9	9
07:45 AM	0	0	3	0	3	0	1	0	0	1	0	1	0	0	1	2	0	0	2	0	0	7	7
Total	0	2	4	0	6	0	4	0	0	4	1	13	0	0	14	13	0	1	0	14	0	38	38
08:00 AM	0	0	0	0	0	1	1	0	0	2	0	4	0	0	4	2	2	2	0	6	0	12	12
08:15 AM	0	0	3	0	3	1	2	0	0	3	0	1	1	0	2	2	0	1	1	3	1	11	12
08:30 AM	0	0	1	1	1	0	0	0	0	0	0	7	0	0	7	5	1	1	0	7	1	15	16
08:45 AM	0	0	2	1	2	0	0	0	0	0	0	3	0	0	3	3	1	1	0	5	1	10	11
Total	0	0	6	2	6	2	3	0	0	5	0	15	1	0	16	12	4	5	1	21	3	48	51
Grand Total	0	2	10	2	12	2	7	0	0	9	1	28	1	0	30	25	4	6	1	35	3	86	89
Approach %	0	16.7	83.3		22.2	77.8	0			10.5	3.3	93.3	3.3		34.9	71.4	11.4	17.1		40.7	3.4	96.6	
Total %	0	2.3	11.6		14	8.1	0				1.2	32.6	1.2			29.1	4.7	7					

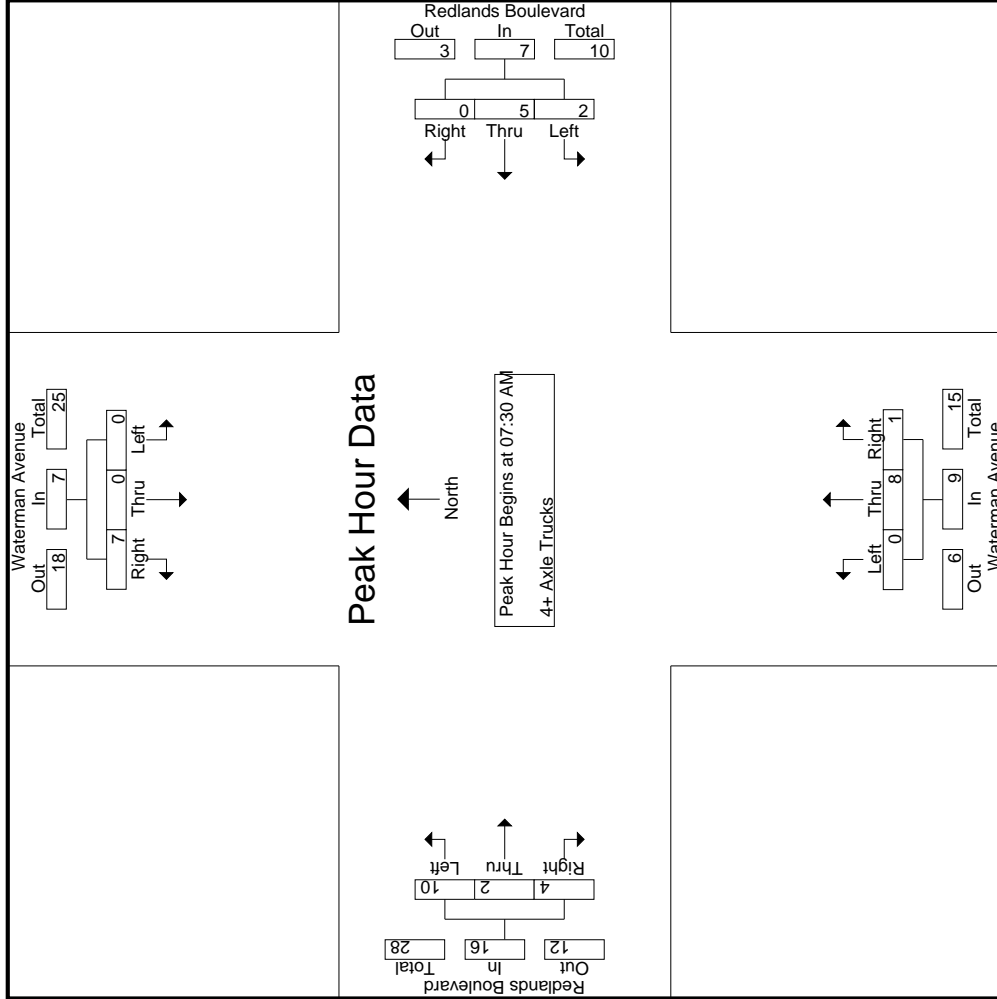
Start Time	Waterman Avenue Southbound					Redlands Boulevard Westbound					Waterman Avenue Northbound					Redlands Boulevard Eastbound								
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
07:30 AM	0	0	1		1	0	1	0		1	0	2	0		2	0	0	1		2	0	1	5	9
07:45 AM	0	0	3		3	0	1	0		1	0	1	0		1	0	1	0		1	0	0	2	7
08:00 AM	0	0	0		0	1	1	0		2	0	4	0		4	2	2	2		2	0	2	6	12
08:15 AM	0	0	3		3	1	2	0		3	0	1	1		2	2	0	1		2	0	1	3	11
Total Volume	0	0	7		7	2	5	0		7	0	8	1		9	10	2	4		16	0	16	39	
% App. Total	0	0	100			28.6	71.4	0			0	88.9	11.1			62.5	12.5	25						
PHF	.000	.000	.583		.583	.500	.625	.000		.583	.000	.500	.250		.563	.625	.250	.500		.667			.813	

Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:30 AM

Counts Unlimited
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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 14-SBCWTREAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 14-SBCWSTREAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Waterman Avenue Southbound			Redlands Boulevard Westbound			Waterman Avenue Northbound			Redlands Boulevard Eastbound			App. Total	Int. Total	
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right			
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1															
Peak Hour for Each Approach Begins at:															
	07:30 AM														
+0 mins.	0	0	1	0	1	0	0	2	0	0	0	0	4	1	5
+15 mins.	0	0	3	0	1	0	0	1	0	0	0	0	2	0	2
+30 mins.	0	0	0	1	1	0	0	4	0	0	0	0	2	2	6
+45 mins.	0	0	3	1	2	0	0	1	1	1	0	0	2	0	3
Total Volume	0	0	7	2	5	0	0	8	1	9	10	2	4	4	16
% App. Total	0	0	100	28.6	71.4	0	0	88.9	11.1	62.5	12.5	25	62.5	12.5	25
PHF	.000	.000	.583	.500	.625	.000	.000	.500	.250	.563	.625	.250	.500	.500	.667

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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 14-SBCWTRP
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	Waterman Avenue Southbound						Redlands Boulevard Westbound						Waterman Avenue Northbound						Redlands Boulevard Eastbound						
	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	
04:00 PM	35	104	39	21	178	154	40	77	37	10	154	171	16	133	22	10	171	110	157	44	12	311	53	814	867
04:15 PM	43	114	36	10	193	199	44	105	50	20	199	235	17	198	20	9	235	99	171	28	1	298	40	925	965
04:30 PM	41	121	32	11	194	150	36	68	46	10	150	263	15	230	18	5	263	98	111	34	4	243	30	850	880
04:45 PM	48	122	43	12	213	41	82	42	8	165	16	244	16	208	20	5	244	100	158	39	0	297	25	919	944
Total	167	461	150	54	778	668	161	332	175	48	668	913	64	769	80	29	913	407	597	145	17	1149	148	3508	3656
05:00 PM	61	136	36	17	233	166	37	80	49	16	166	262	13	230	19	8	262	136	177	34	1	347	42	1008	1050
05:15 PM	44	127	40	18	211	195	57	90	48	5	195	257	12	220	25	6	257	112	157	31	1	300	30	963	993
05:30 PM	48	130	44	10	222	169	33	96	40	10	169	242	8	217	17	10	242	78	153	39	5	270	35	903	938
05:45 PM	39	128	33	8	200	158	35	80	43	5	158	228	14	192	22	11	228	91	136	43	1	270	25	856	881
Total	192	521	153	53	866	688	162	346	180	36	688	989	47	859	83	35	989	417	623	147	8	1187	132	3730	3862
Grand Total	359	982	303	107	1644	1356	323	678	355	84	1356	1902	111	1628	163	64	1902	824	1220	292	25	2336	280	7238	7518
Approach %	21.8	59.7	18.4				23.8	50	26.2				5.8	85.6	8.6			35.3	52.2	12.5					
Total %	5	13.6	4.2				4.5	9.4	4.9				1.5	22.5	2.3			11.4	16.9	4				3.7	96.3
Passenger Vehicles	357	974	290		1728	1426	319	669	354		1426	1955	110	1621	160		1955	791	1203	292		2311	0	0	7420
% Passenger Vehicles	99.4	99.2	95.7	100	98.7	99.7	98.8	98.7	99.7	100	99	99.4	99.1	99.6	98.2	100	99.4	96	98.6	100	100	97.9	0	0	98.7
Large 2 Axle Vehicles	1	6	3		10	7	2	4	1		7	8	0	5	3		8	6	9	0		15	0	0	40
% Large 2 Axle Vehicles	0.3	0.6	1	0	0.6	0.5	0.6	0.6	0.3	0	0.5	0.4	0	0.3	1.8	0	0.4	0.7	0.7	0	0	0.6	0	0	0.5
3 Axle Vehicles	0	1	1		2	2	0	2	0		2	2	1	1	0		2	7	2	0		9	0	0	15
% 3 Axle Vehicles	0	0.1	0.3	0	0.1	0.1	0	0.3	0	0	0.1	0.1	0.9	0.1	0	0	0.1	0.8	0.2	0	0	0.4	0	0	0.2
4+ Axle Trucks	1	1	9		11	5	2	3	0		5	1	0	1	0		1	20	6	0		26	0	0	43
% 4+ Axle Trucks	0.3	0.1	3	0	0.6	0.3	0.6	0.4	0	0	0.3	0.1	0	0.1	0	0	0.1	2.4	0.5	0	0	1.1	0	0	0.6

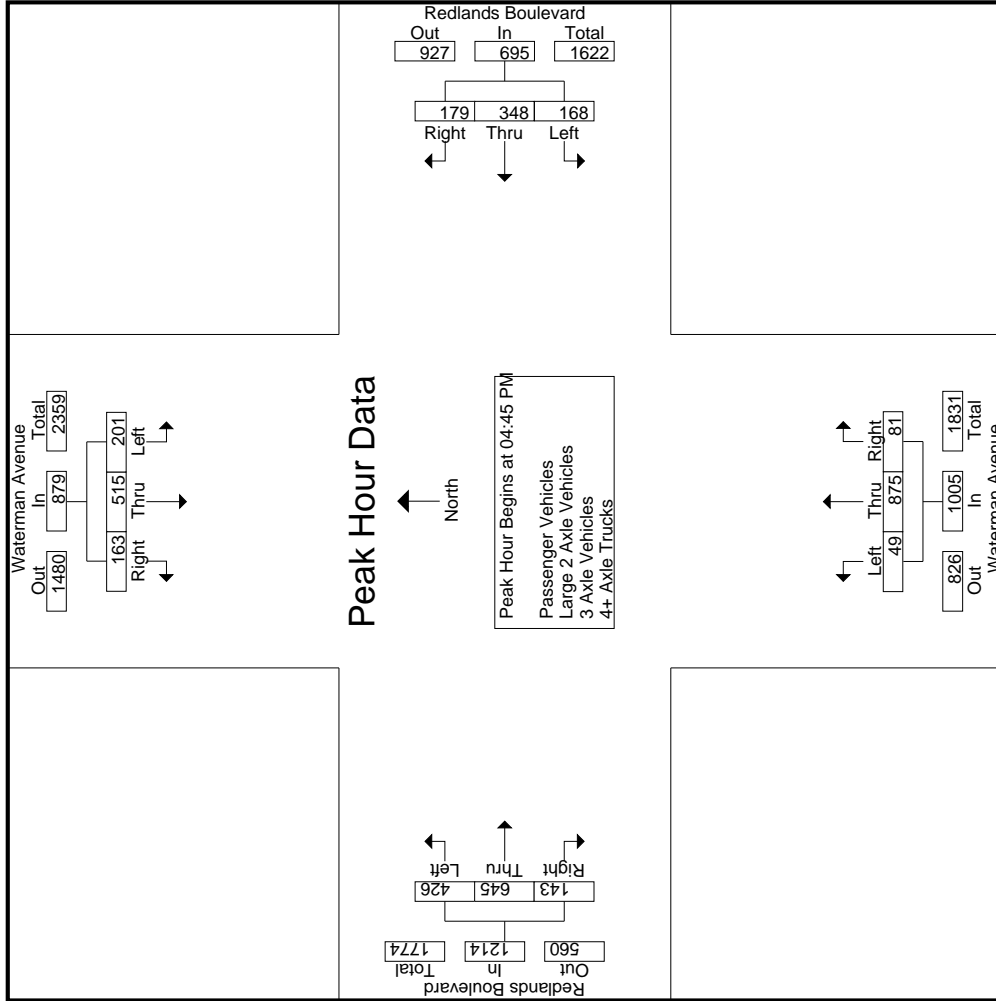
Start Time	Waterman Avenue Southbound						Redlands Boulevard Westbound						Waterman Avenue Northbound						Redlands Boulevard Eastbound					
	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total
04:45 PM	48	122	43		213	41	82	42			165	20	16	208			20	244			39		297	
05:00 PM	61	136	36		233	37	80	49			166	19	13	230			19	262			34		347	
05:15 PM	44	127	40		211	57	90	48			195	25	12	220			25	257			31		300	
05:30 PM	48	130	44		222	33	96	40			169	17	8	217			17	242			39		270	
Total Volume	201	515	163		879	168	348	179			695	81	49	875			81	1005			143		1214	
% App. Total	22.9	58.6	18.5		18.5	24.2	50.1	25.8			25.8	8.1	4.9	87.1			8.1	35.1			53.1		11.8	
PHF	.824	.947	.926		.943	.737	.906	.913			.891	.810	.766	.951			.810	.959			.917		.875	

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:45 PM

Counts Unlimited
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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 14-SBCWTRPEM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 14-SBCWTRPEM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Waterman Avenue Southbound			Redlands Boulevard Westbound			Waterman Avenue Northbound			Redlands Boulevard Eastbound			App. Total	Int. Total		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right				
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																
Peak Hour for Each Approach Begins at:																
	04:45 PM			04:45 PM			04:30 PM			04:45 PM						
+0 mins.	48	122	43	213	41	82	42	165	15	230	18	263	100	158	39	297
+15 mins.	61	136	36	233	37	80	49	166	16	208	20	244	136	177	34	347
+30 mins.	44	127	40	211	57	90	48	195	13	230	19	262	112	157	31	300
+45 mins.	48	130	44	222	33	96	40	169	12	220	25	257	78	153	39	270
Total Volume	201	515	163	879	168	348	179	695	56	888	82	1026	426	645	143	1214
% App. Total	22.9	58.6	18.5		24.2	50.1	25.8		5.5	86.5	8		35.1	53.1	11.8	
PHF	.824	.947	.926	.943	.737	.906	.913	.891	.875	.965	.820	.975	.783	.911	.917	.875

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City of San Bernardino
 N/S: Waterman Avenue
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 Weather: Clear

File Name : 14-SBCWTRPEM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles

Start Time	Waterman Avenue Southbound					Redlands Boulevard Westbound					Waterman Avenue Northbound					Redlands Boulevard Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	33	102	39	21	174	39	73	37	10	149	16	133	21	10	170	107	152	44	12	303	53	796	849
04:15 PM	43	113	34	10	190	43	103	50	20	196	17	197	20	9	234	95	169	28	1	292	40	912	952
04:30 PM	41	121	32	11	194	35	68	46	10	149	15	230	18	5	263	94	110	34	4	238	30	844	874
04:45 PM	48	121	40	12	209	40	81	42	8	163	16	207	20	5	243	92	154	39	0	285	25	900	925
Total	165	457	145	54	767	157	325	175	48	657	64	767	79	29	910	388	585	145	17	1118	148	3452	3600
05:00 PM	61	136	35	17	232	37	79	49	16	165	13	230	19	8	262	133	176	34	1	343	42	1002	1044
05:15 PM	44	127	38	18	209	57	90	48	5	195	11	220	23	6	254	108	156	31	1	295	30	953	983
05:30 PM	48	129	41	10	218	33	95	39	10	167	8	215	17	10	240	75	152	39	5	266	35	891	926
05:45 PM	39	125	31	8	195	35	80	43	5	158	14	189	22	11	225	87	134	43	1	264	25	842	867
Total	192	517	145	53	854	162	344	179	36	685	46	854	81	35	981	403	618	147	8	1168	132	3688	3820
Grand Total	357	974	290	107	1621	319	669	354	84	1342	110	1621	160	64	1891	791	1203	292	25	2286	280	7140	7420
Approach %	22	60.1	17.9			23.8	49.9	26.4			5.8	85.7	8.5		26.5	34.6	52.6	12.8		32	3.8	96.2	
Total %	5	13.6	4.1			4.5	9.4	5			1.5	22.7	2.2		11.1	16.8	4.1						

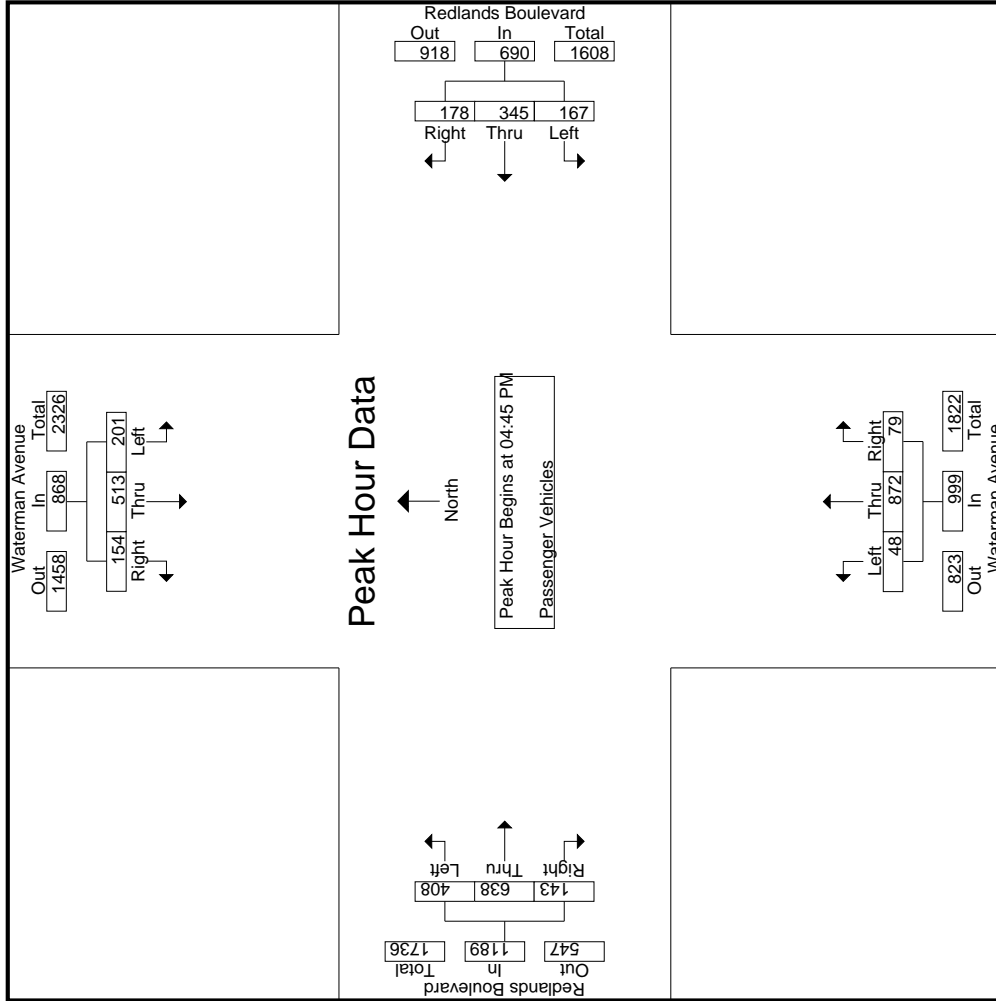
Start Time	Waterman Avenue Southbound					Redlands Boulevard Westbound					Waterman Avenue Northbound					Redlands Boulevard Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:45 PM	48	121	40		209	40	81	42		163	16	207	20		243	92	154	39		285			900
05:00 PM	61	136	35		232	37	79	49		165	13	230	19		262	133	176	34		343			1002
05:15 PM	44	127	38		209	57	90	48		195	11	220	23		254	108	156	31		295			953
05:30 PM	48	129	41		218	33	95	39		167	8	215	17		240	75	152	39		266			891
Total Volume	201	513	154		868	167	345	178		690	48	872	79		999	408	638	143		1189			3746
% App. Total	23.2	59.1	17.7			24.2	50	25.8			4.8	87.3	7.9			34.3	53.7	12					
PHF	.824	.943	.939		.935	.732	.908	.908		.885	.750	.948	.859		.953	.767	.906	.917					.935

Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:45 PM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 14-SBCWTRPEM
 Site Code : 05117141
 Start Date : 3/2/2017
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City of San Bernardino
 N/S: Waterman Avenue
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File Name : 14-SBCWTRPEM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Waterman Avenue Southbound			Redlands Boulevard Westbound			Waterman Avenue Northbound			Redlands Boulevard Eastbound			App. Total	Int. Total		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right				
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																
Peak Hour for Each Approach Begins at:																
	04:45 PM			04:45 PM			04:45 PM			04:45 PM			04:45 PM			
+0 mins.	48	121	40	209	40	81	42	163	16	207	20	243	92	154	39	285
+15 mins.	61	136	35	232	37	79	49	165	13	230	19	262	133	176	34	343
+30 mins.	44	127	38	209	57	90	48	195	11	220	23	254	108	156	31	295
+45 mins.	48	129	41	218	33	95	39	167	8	215	17	240	75	152	39	266
Total Volume	201	513	154	868	167	345	178	690	48	872	79	999	408	638	143	1189
% App. Total	23.2	59.1	17.7		24.2	50	25.8		4.8	87.3	7.9		34.3	53.7	12	
PHF	.824	.943	.939	.935	.732	.908	.908	.885	.750	.948	.859	.953	.767	.906	.917	.867

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 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 14-SBCWTRPEM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Large 2 Axle Vehicles

Start Time	Waterman Avenue Southbound					Redlands Boulevard Westbound					Waterman Avenue Northbound					Redlands Boulevard Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	1	2	0	0	3	0	2	0	0	2	0	0	1	0	1	2	2	0	0	4	0	10	10
04:15 PM	0	1	0	0	1	1	1	0	0	2	0	0	0	0	0	0	1	0	0	1	0	4	4
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	0	2	2
04:45 PM	0	1	0	0	1	1	0	0	0	1	0	1	0	0	1	1	2	0	0	3	0	6	6
Total	1	4	0	0	5	2	3	0	0	5	0	1	1	0	2	4	6	0	0	10	0	22	22
05:00 PM	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	3	3
05:15 PM	0	0	2	0	2	0	0	0	0	0	0	2	0	0	2	0	1	0	0	1	0	5	5
05:30 PM	0	1	0	0	1	0	0	1	0	1	0	1	0	0	1	2	0	0	0	2	0	5	5
05:45 PM	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	1	0	0	1	0	5	5
Total	0	2	3	0	5	0	1	1	0	2	0	4	2	0	6	2	3	0	0	5	0	18	18
Grand Total	1	6	3	0	10	2	4	1	0	7	0	5	3	0	8	6	9	0	0	15	0	40	40
Approach %	10	60	30		28.6	57.1	14.3			17.5	0	62.5	37.5		20	40	60		37.5				
Total %	2.5	15	7.5		25	5	10	2.5			0	12.5	7.5		15	22.5	0				0	100	

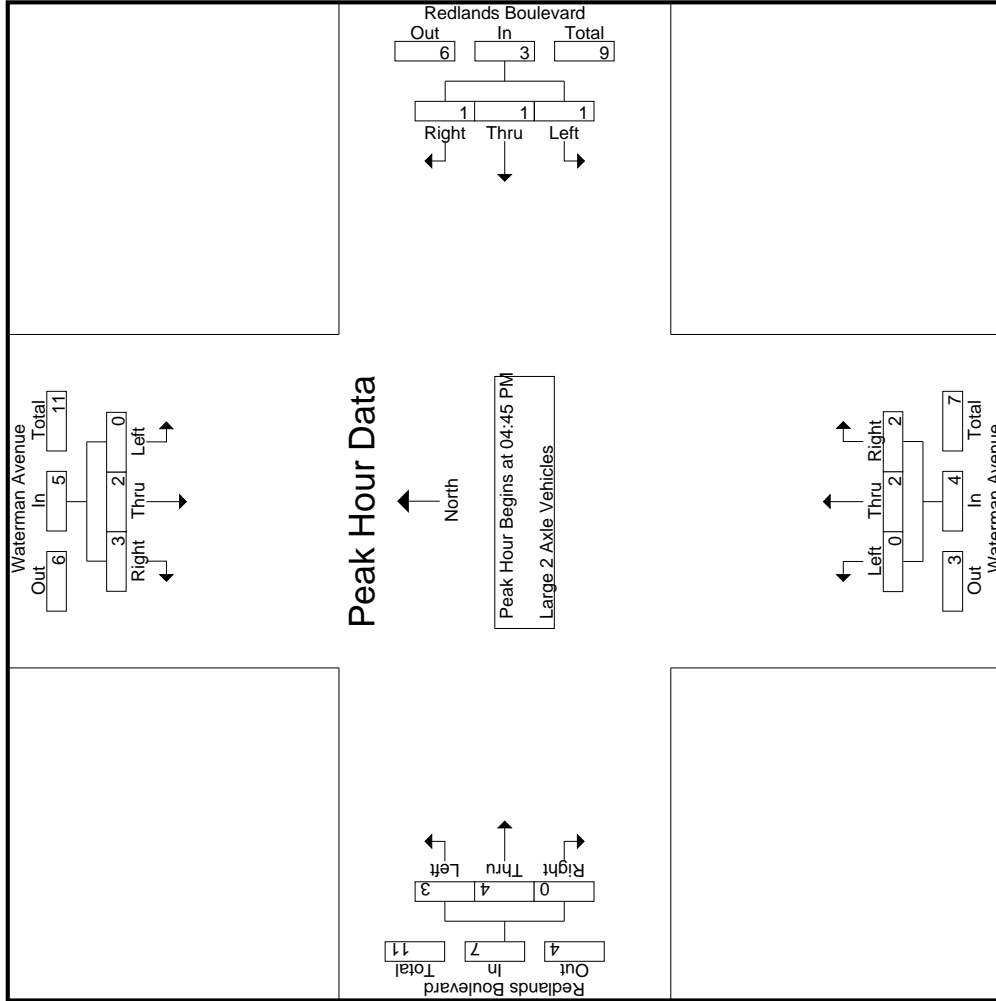
Start Time	Waterman Avenue Southbound					Redlands Boulevard Westbound					Waterman Avenue Northbound					Redlands Boulevard Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:45 PM	0	0	1	0	1	1	0	0	0	1	0	0	1	0	1	1	2	0	0	3	0	3	3
05:00 PM	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	1
05:15 PM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	2	0	1	0	0	1	0	1	1
05:30 PM	0	1	0	0	1	0	0	1	0	1	0	0	1	0	1	2	0	0	0	2	0	2	2
Total Volume	0	2	3		5	1	1	1		3	0	2	2		4	3	4		0	7		19	
% App. Total	0	40	60		60	33.3	33.3			50	0	50	50		57.1	42.9	57.1		0	79.2			
PHF	.000	.500	.375		.625	.250	.250			.750	.000	.500	.250		.500	.375	.500		.000	.583			

Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:45 PM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 14-SBCWTRPEM
 Site Code : 05117141
 Start Date : 3/2/2017
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City of San Bernardino
 N/S: Waterman Avenue
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 Weather: Clear

File Name : 14-SBCWTRPEM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Waterman Avenue Southbound			Redlands Boulevard Westbound			Waterman Avenue Northbound			Redlands Boulevard Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	04:45 PM													
+0 mins.	0	1	0	1	0	0	0	1	0	0	1	0	0	3
+15 mins.	0	0	1	1	0	0	0	0	0	0	0	1	0	1
+30 mins.	0	0	2	2	0	0	0	0	2	0	2	0	0	1
+45 mins.	0	1	0	1	0	0	1	0	0	0	2	0	0	2
Total Volume	0	2	3	5	1	1	1	3	2	2	4	4	0	7
% App. Total	0	40	60	33.3	33.3	33.3	33.3	.750	.500	.250	.500	.250	0	.583
PHF	.000	.500	.375	.625	.250	.250	.250	.750	.000	.250	.500	.250	.000	.583

Counts Unlimited
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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 14-SBCWTRPEM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 3 Axle Vehicles

Start Time	Waterman Avenue Southbound					Redlands Boulevard Westbound					Waterman Avenue Northbound					Redlands Boulevard Eastbound								
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	2	0	0	0	2	0	0	4	4
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	1	0	1	0	1	0	0	1	0	0	0	0	3	1	0	0	4	4	0	0	6	6
Total	0	0	1	0	1	0	2	0	0	2	0	1	0	0	5	1	0	0	6	6	0	10	10	10
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	2	0	0	2	2
05:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	2	2
Total	0	1	0	0	1	0	0	0	0	0	1	0	0	0	2	1	0	0	3	3	0	5	5	5
Grand Total	0	1	1	0	2	0	2	0	0	2	1	1	0	0	2	7	2	0	0	9	0	15	15	15
Approach %	0	50	6.7		13.3	0	100	0		50	6.7	50	0		77.8	22.2	0		60	0	100			
Total %	0	6.7	6.7		13.3	0	13.3	0		6.7	6.7	6.7	0		46.7	13.3	0		60	0	100			

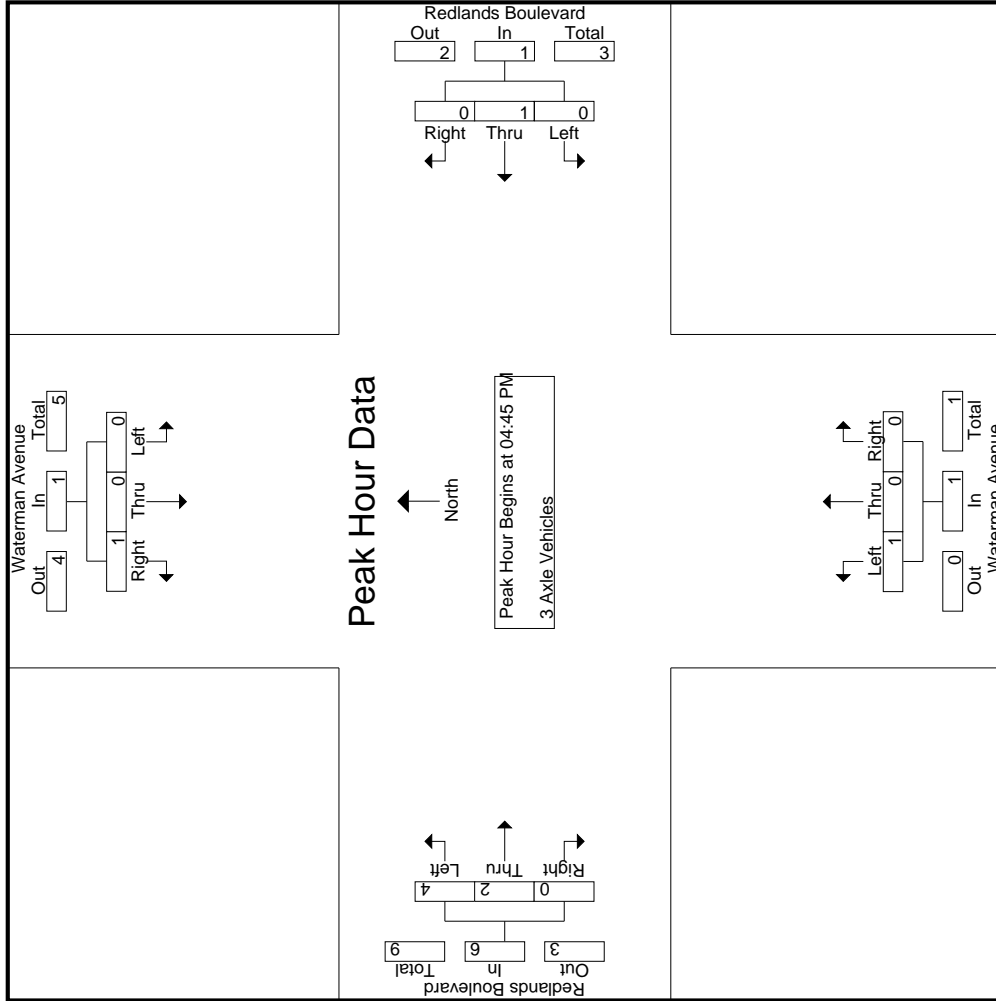
Start Time	Waterman Avenue Southbound					Redlands Boulevard Westbound					Waterman Avenue Northbound					Redlands Boulevard Eastbound								
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
04:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0
Total Volume	0	0	1		1	0	0	0		0	1	0	0		1	4	2	0		6	0	6	6	6
% App. Total	0	0	100		.250	0	100	0		.250	0	0	0		66.7	33.3	0		0	0	0	0	0	0
PHF	.000	.000	.250		.250	.000	.250	.000		.250	.000	.250	.000		.250	.333	.500	.000		.375	.000	.375	.375	.375

Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:45 PM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 14-SBCWTRPEM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 14-SBCWTRPEM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Waterman Avenue Southbound			Redlands Boulevard Westbound			Waterman Avenue Northbound			Redlands Boulevard Eastbound			App. Total	Int. Total			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right					
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	04:45 PM																
+0 mins.	0	0	1	0	1	0	0	0	0	0	0	0	3	1	0	0	4
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2
Total Volume	0	0	1	0	1	0	0	1	0	0	0	0	4	2	0	0	6
% App. Total	0	0	100	0	100	0	0	100	0	0	0	0	66.7	33.3	0	0	37.5
PHF	.000	.000	.250	.000	.250	.000	.000	.250	.000	.000	.000	.000	.333	.500	.000	.000	.375

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 14-SBCWTRP
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 4+ Axle Trucks

Start Time	Waterman Avenue Southbound					Redlands Boulevard Westbound					Waterman Avenue Northbound					Redlands Boulevard Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	1	0	0	0	1	1	2	0	0	3	0	0	0	0	0	1	3	0	0	4	0	8	8
04:15 PM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	2	1	0	0	3	0	5	5
04:30 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	3	0	0	0	3	0	4	4
04:45 PM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	4	1	0	0	5	0	7	7	
Total	1	0	4	0	5	2	2	0	0	4	0	0	0	0	0	10	5	0	0	15	0	24	24
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	3	3
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	0	4	4	
05:30 PM	0	0	3	0	3	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0	5	5
05:45 PM	0	1	2	0	3	0	0	0	0	0	0	0	0	0	3	1	0	0	4	0	7	7	
Total	0	1	5	0	6	0	1	0	0	1	0	1	0	0	1	10	1	0	0	11	0	19	19
Grand Total	1	1	9	0	11	2	3	0	0	5	0	1	0	0	1	20	6	0	0	26	0	43	43
Approach %	9.1	9.1	81.8			40	60	0		11.6	0	100	0		76.9	23.1	0		60.5				
Total %	2.3	2.3	20.9		25.6	4.7	7	0		11.6	0	2.3	0		46.5	14	0		60.5		0	100	

3.1-414

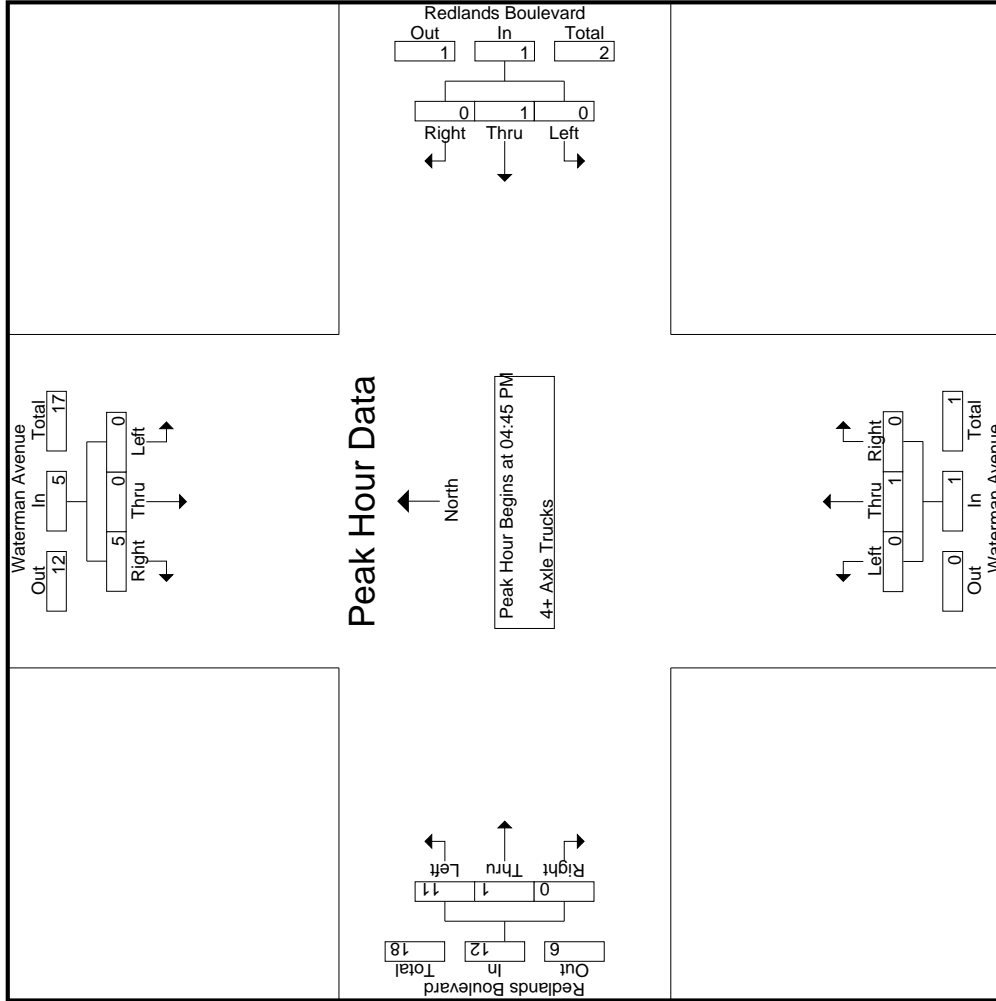
Start Time	Waterman Avenue Southbound					Redlands Boulevard Westbound					Waterman Avenue Northbound					Redlands Boulevard Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:45 PM	0	0	2		2	0	0	0		0	0	0	0		0	4	1	0		0	0	5	7
05:00 PM	0	0	0		0	0	0	0		0	0	0	0		0	3	0	0		0	0	3	3
05:15 PM	0	0	0		0	0	0	0		0	0	0	0		0	4	0	0		0	0	4	4
05:30 PM	0	0	3		3	0	1	0		1	0	1	0		3	1	0	0		0	0	0	5
Total Volume	0	0	5		5	0	1	0		1	0	1	0		11	1	0	0		0	0	12	19
% App. Total	0	0	100		100	0	100	0		100	0	100	0		91.7	8.3	0	0		0	0	0	19
PHF	.000	.000	.417		.417	.000	.250	.000		.250	.000	.250	.000		.688	.250	.000	.000		.600	.000	.679	

Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:45 PM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Waterman Avenue
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 14-SBCWTRPEM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
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City of San Bernardino
 N/S: Waterman Avenue
 E/W: Redlands Boulevard
 Weather: Clear

File Name : 14-SBCWTRPEM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Waterman Avenue Southbound			Redlands Boulevard Westbound			Waterman Avenue Northbound			Redlands Boulevard Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	04:45 PM													
+0 mins.	0	0	2	0	0	0	0	0	0	0	0	0	4	5
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	3	3
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	4	4
+45 mins.	0	0	3	0	1	0	0	1	0	0	0	0	0	0
Total Volume	0	0	5	0	1	0	0	1	0	0	1	0	11	12
% App. Total	0	0	100	0	100	0	0	100	0	0	100	0	91.7	8.3
PHF	.000	.000	.417	.000	.250	.000	.000	.250	.000	.000	.250	.000	.688	.250
														.600

Location: San Bernardino
 N/S: Waterman Avenue
 E/W: Redlands Boulevard



Date: 3/2/2017
 Day: Thursday

PEDESTRIANS

	North Leg Waterman Avenue	East Leg Redlands Boulevard	South Leg Waterman Avenue	West Leg Redlands Boulevard	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	1	0	0	1
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	4	4
8:00 AM	0	1	0	0	1
8:15 AM	0	0	2	0	2
8:30 AM	0	0	1	0	1
8:45 AM	0	0	2	1	3
TOTAL VOLUMES:	0	2	5	5	12

	North Leg Waterman Avenue	East Leg Redlands Boulevard	South Leg Waterman Avenue	West Leg Redlands Boulevard	TOTAL
4:00 PM	0	0	2	0	2
4:15 PM	0	2	4	0	6
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	1	1
5:15 PM	0	1	2	0	3
5:30 PM	0	0	1	5	6
5:45 PM	0	0	1	0	1
TOTAL VOLUMES:	0	3	10	6	19

Location: San Bernardino
 N/S: Waterman Avenue
 E/W: Redlands Boulevard



Date: 3/2/2017
 Day: Thursday

BICYCLES

	North Leg Waterman Avenue	East Leg Redlands Boulevard	South Leg Waterman Avenue	West Leg Redlands Boulevard	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	1	1	0	2
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	0	1	1	0	2

	North Leg Waterman Avenue	East Leg Redlands Boulevard	South Leg Waterman Avenue	West Leg Redlands Boulevard	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	1	1
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	1	1	0	2
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	1	1	1	3

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Carnegie Drive
 E/W: Hospitality Lane
 Weather: Clear

File Name : 15-SBCCAHOAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	Carnegie Drive Southbound					Hospitality Lane Westbound					Carnegie Drive Northbound					Hospitality Lane Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	1	12	5	2	18	17	35	4	1	56	98	31	8	3	137	52	83	19	9	154	15	365	380
07:15 AM	0	8	3	3	11	16	32	2	0	50	124	48	9	3	181	40	81	21	5	142	11	384	395
07:30 AM	6	10	6	2	22	13	43	3	0	59	120	43	10	6	173	39	63	19	1	121	9	375	384
07:45 AM	1	24	9	2	34	15	46	7	4	68	189	52	11	5	252	43	65	16	4	124	15	478	493
Total	8	54	23	9	85	61	156	16	5	233	531	174	38	17	743	174	292	75	19	541	50	1602	1652
08:00 AM	3	14	8	7	25	22	48	7	2	77	160	62	18	14	240	35	84	20	4	139	27	481	508
08:15 AM	6	23	9	5	38	19	41	5	3	65	149	44	9	6	202	33	93	28	5	154	19	459	478
08:30 AM	4	20	9	4	33	23	47	6	3	76	132	44	21	14	197	46	86	24	4	156	25	462	487
08:45 AM	7	24	10	4	41	23	47	6	2	76	102	46	16	12	164	35	86	28	6	149	24	430	454
Total	20	81	36	20	137	87	183	24	10	294	543	196	64	46	803	149	349	100	19	598	95	1832	1927
Grand Total	28	135	59	29	222	148	339	40	15	527	1074	370	102	63	1546	323	641	175	38	1139	145	3434	3579
Approach %	12.6	60.8	26.6			28.1	64.3	7.6			69.5	23.9	6.6			28.4	56.3	15.4					
Total %	0.8	3.9	1.7		6.5	4.3	9.9	1.2		15.3	31.3	10.8	3		45	9.4	18.7	5.1		33.2	4.1	95.9	
Passenger Vehicles	27	127	57		240	143	315	39		512	1050	368	98		1576	319	610	152		1115	0	0	3443
% Passenger Vehicles	96.4	94.1	96.6	100	95.6	96.6	92.9	97.5	100	94.5	97.8	99.5	96.1	95.2	97.9	98.8	95.2	86.9	89.5	94.7	0	0	96.2
Large 2 Axle Vehicles	1	6	1		8	3	10	1		14	12	2	2		17	2	11	10		25	0	0	64
% Large 2 Axle Vehicles	3.6	4.4	1.7	0	3.2	2	2.9	2.5	0	2.6	1.1	0.5	2	1.6	1.1	0.6	1.7	5.7	5.3	2.1	0	0	1.8
3 Axle Vehicles	0	1	0		1	1	12	0		13	1	0	1		3	1	18	2		22	0	0	39
% 3 Axle Vehicles	0	0.7	0	0	0.4	0.7	3.5	0	0	2.4	0.1	0	1	1.6	0.2	0.3	2.8	1.1	2.6	1.9	0	0	1.1
4+ Axle Trucks	0	1	1		2	1	2	0		3	11	0	1		13	1	2	11		15	0	0	33
% 4+ Axle Trucks	0	0.7	1.7	0	0.8	0.7	0.6	0	0	0.6	1	0	1	1.6	0.8	0.3	0.3	6.3	2.6	1.3	0	0	0.9

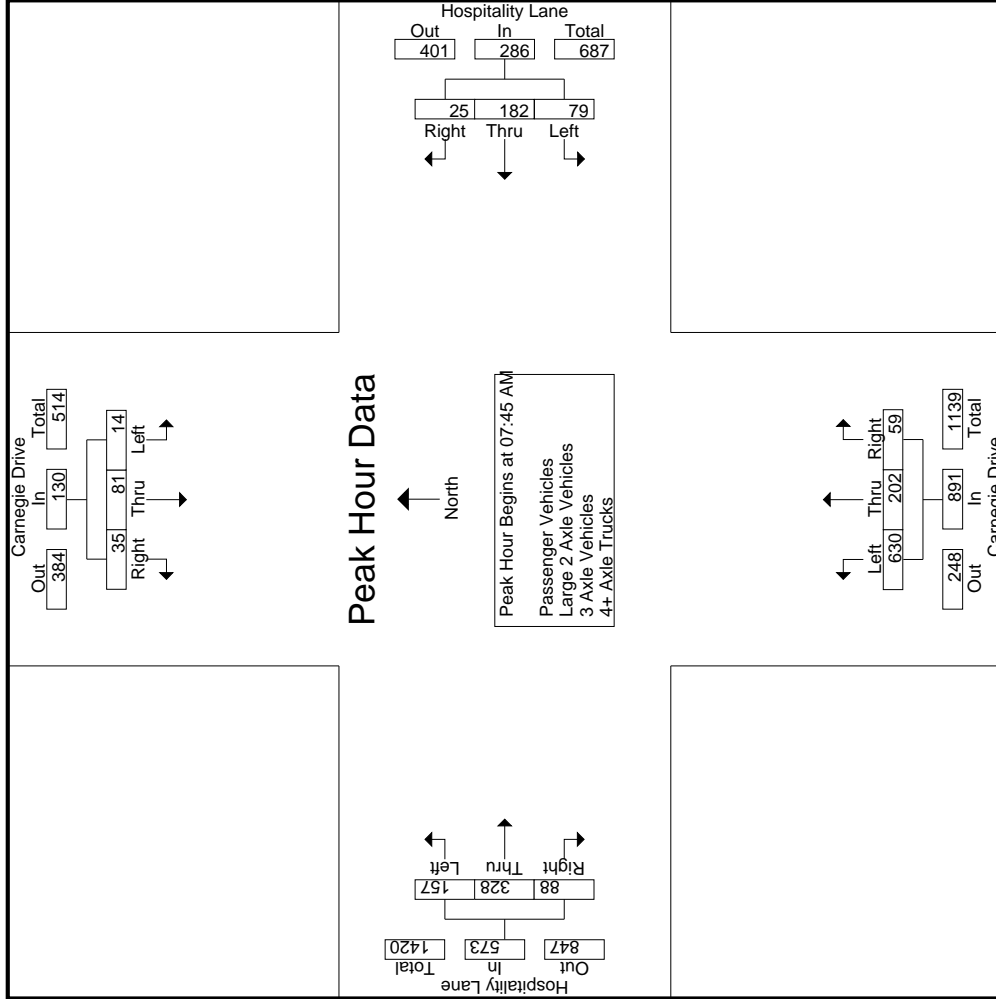
Start Time	Carnegie Drive Southbound					Hospitality Lane Westbound					Carnegie Drive Northbound					Hospitality Lane Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:45 AM	1	24	9		34	15	46			7	68	11			11	52	11			252	43	65	124
08:00 AM	3	14	8		25	22	48			7	77	18			18	62	18			240	35	84	139
08:15 AM	6	23	9		38	19	41			5	65	149			9	44	9			202	33	93	154
08:30 AM	4	20	9		33	23	47			6	76	132			21	44	21			197	46	86	156
Total Volume	14	81	35		130	79	182			25	286	630			59	202	891			891	157	328	573
% App. Total	10.8	62.3	26.9		26.9	27.6	63.6			8.7	70.7	70.7			6.6	22.7	27.4			57.2	15.4	15.4	1880
PHF	.583	.844	.972		.855	.859	.948			.893	.929	.833			.702	.884	.884			.882	.786	.918	.977

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:45 AM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Carnegie Drive
 E/W: Hospitality Lane
 Weather: Clear

File Name : 15-SBCCAHOAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Carnegie Drive
 E/W: Hospitality Lane
 Weather: Clear

File Name : 15-SBCCAHOAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Carnegie Drive Southbound			Hospitality Lane Westbound			Carnegie Drive Northbound			Hospitality Lane Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	08:00 AM			08:00 AM			07:45 AM			08:00 AM				
+0 mins.	3	14	8	22	48	7	77	52	11	35	84	20	139	
+15 mins.	6	23	9	19	41	5	65	62	18	33	93	28	154	
+30 mins.	4	20	9	23	47	6	76	44	9	46	86	24	156	
+45 mins.	7	24	10	23	47	6	76	44	21	35	86	28	149	
Total Volume	20	81	36	87	183	24	294	202	59	149	349	100	598	
% App. Total	14.6	59.1	26.3	29.6	62.2	8.2	70.7	22.7	6.6	24.9	58.4	16.7		
PHF	.714	.844	.900	.946	.953	.857	.955	.815	.702	.810	.938	.893	.958	

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Carnegie Drive
 E/W: Hospitality Lane
 Weather: Clear

File Name : 15-SBCCAHOAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles

Start Time	Carnegie Drive Southbound					Hospitality Lane Westbound					Carnegie Drive Northbound					Hospitality Lane Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	1	8	3	2	12	16	32	4	1	52	96	31	7	2	134	52	79	16	8	147	13	345	358
07:15 AM	0	8	3	3	11	16	29	2	0	47	122	48	9	3	179	39	74	18	4	131	10	368	378
07:30 AM	6	10	6	2	22	13	41	3	0	57	118	43	10	6	171	39	60	17	1	116	9	366	375
07:45 AM	0	23	9	2	32	13	42	6	4	61	186	52	11	5	249	43	61	13	4	117	15	459	474
Total	7	49	21	9	77	58	144	15	5	217	522	174	37	16	733	173	274	64	17	511	47	1538	1585
08:00 AM	3	13	8	7	24	21	46	7	2	74	158	62	17	13	237	35	81	20	4	136	26	471	497
08:15 AM	6	23	9	5	38	19	37	5	3	61	144	42	8	6	194	33	88	24	4	145	18	438	456
08:30 AM	4	19	9	4	32	22	43	6	3	71	126	44	20	13	190	44	83	18	4	145	24	438	462
08:45 AM	7	23	10	4	40	23	45	6	2	74	100	46	16	12	162	34	84	26	5	144	23	420	443
Total	20	78	36	20	134	85	171	24	10	280	528	194	61	44	783	146	336	88	17	570	91	1767	1858
Grand Total	27	127	57	29	211	143	315	39	15	497	1050	368	98	60	1516	319	610	152	34	1081	138	3305	3443
Approach %	12.8	60.2	27		6.4	28.8	63.4	7.8		15	69.3	24.3	6.5		45.9	29.5	56.4	14.1		32.7	4	96	
Total %	0.8	3.8	1.7			4.3	9.5	1.2			31.8	11.1	3			9.7	18.5	4.6					

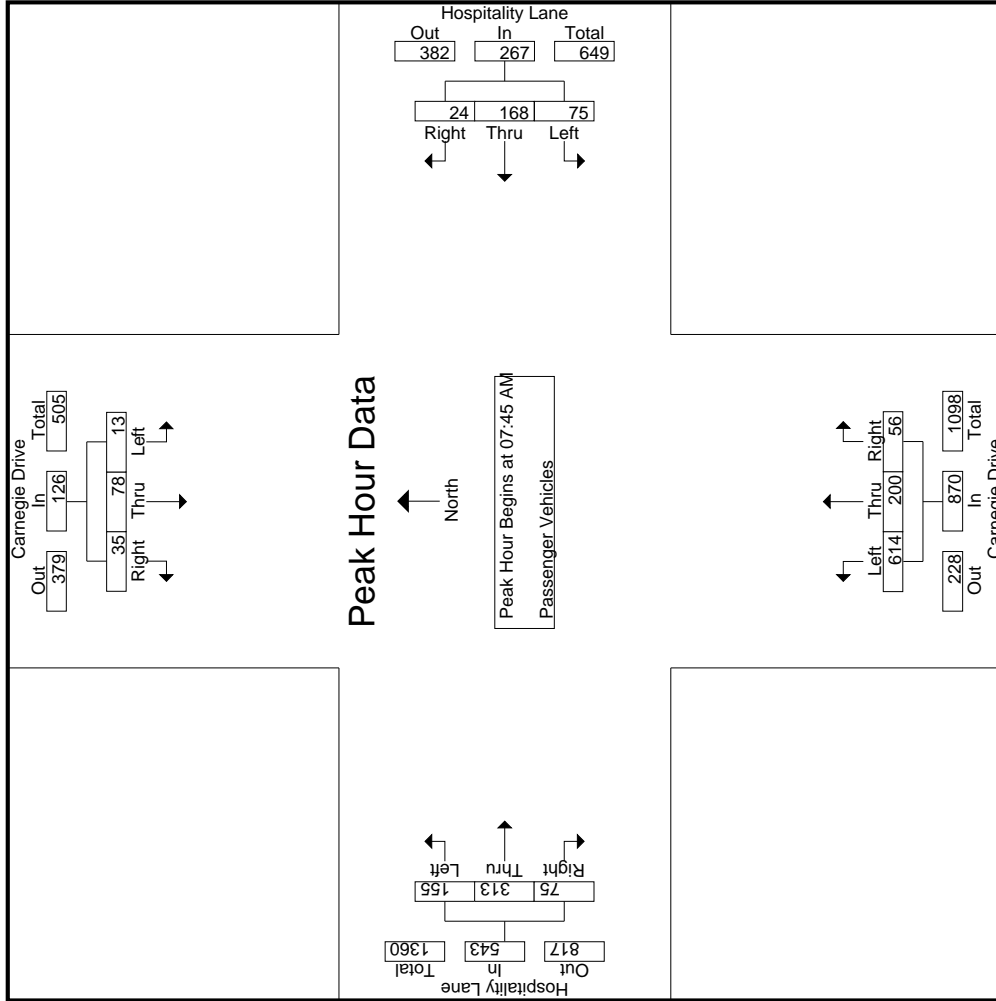
Start Time	Carnegie Drive Southbound					Hospitality Lane Westbound					Carnegie Drive Northbound					Hospitality Lane Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:45 AM	0	23	9	2	32	13	42	6	4	61	186	52	11	5	249	43	61	13	4	117			459
08:00 AM	3	13	8	7	24	21	46	7	2	74	158	62	17	13	237	35	81	20	4	136			471
08:15 AM	6	23	9	5	38	19	37	5	3	61	144	42	8	6	194	33	88	24	4	145			438
08:30 AM	4	19	9	4	32	22	43	6	3	71	126	44	20	13	190	44	83	18	4	145			438
Total Volume	13	78	35		126	75	168	24		267	614	200	56		870	155	313	75		543			1806
% App. Total	10.3	61.9	27.8		6.4	28.1	62.9	9		15	70.6	23	6.4		45.9	28.5	57.6	13.8		32.7			
PHF	.542	.848	.972		.829	.852	.913	.857		.902	.825	.806	.700		.873	.881	.889	.781		.936			.959

Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:45 AM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Carnegie Drive
 E/W: Hospitality Lane
 Weather: Clear

File Name : 15-SBCCAHOAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Carnegie Drive
 E/W: Hospitality Lane
 Weather: Clear

File Name : 15-SBCCAHOAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Carnegie Drive Southbound			Hospitality Lane Westbound			Carnegie Drive Northbound			Hospitality Lane Eastbound			App. Total	Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total		
Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	07:45 AM													
+0 mins.	0	23	9	32	13	42	6	61	52	11	43	61	13	117
+15 mins.	3	13	8	24	21	46	7	74	62	17	35	81	20	136
+30 mins.	6	23	9	38	19	37	5	61	42	8	33	88	24	145
+45 mins.	4	19	9	32	22	43	6	71	44	20	44	83	18	145
Total Volume	13	78	35	126	75	168	24	267	200	56	155	313	75	543
% App. Total	10.3	61.9	27.8	28.1	62.9	9	9	70.6	23	6.4	28.5	57.6	13.8	
PHF	.542	.848	.972	.829	.852	.913	.857	.902	.806	.700	.881	.889	.781	.936

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Carnegie Drive
 E/W: Hospitality Lane
 Weather: Clear

File Name : 15-SBCCAHOAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Large 2 Axle Vehicles

Start Time	Carnegie Drive Southbound					Hospitality Lane Westbound					Carnegie Drive Northbound					Hospitality Lane Eastbound								
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
07:00 AM	0	3	1	0	4	0	2	0	0	2	2	0	0	0	2	0	1	1	0	2	0	10	10	10
07:15 AM	0	0	0	0	0	0	2	0	0	2	2	0	0	0	2	0	4	3	1	7	1	11	11	12
07:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2	0	0	2	0	3	3	3
07:45 AM	1	1	0	0	2	2	2	1	0	5	2	0	0	0	2	0	1	0	0	1	0	10	10	10
Total	1	4	1	0	6	2	6	1	0	9	7	0	0	0	7	0	8	4	1	12	1	34	34	35
08:00 AM	0	1	0	0	1	1	1	0	0	2	1	0	0	0	1	0	0	0	0	0	0	4	4	4
08:15 AM	0	0	0	0	0	0	2	0	0	2	1	2	1	0	4	0	2	3	1	5	1	11	11	12
08:30 AM	0	1	0	0	1	0	0	0	0	0	3	0	1	1	4	2	0	3	0	5	1	10	10	11
08:45 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	2	2	2
Total	0	2	0	0	2	1	4	0	0	5	5	2	2	1	9	2	3	6	1	11	2	27	27	29
Grand Total	1	6	1	0	8	3	10	1	0	14	12	2	2	1	16	2	11	10	2	23	3	61	61	64
Approach %	12.5	75	12.5		21.4	4.9	71.4	7.1		23	19.7	3.3	12.5		26.2	8.7	47.8	43.5		37.7	4.7	95.3	95.3	
Total %	1.6	9.8	1.6		13.1	4.9	16.4	1.6		23	19.7	3.3	3.3		26.2	3.3	18	16.4		37.7	4.7	95.3	95.3	

3.1-425

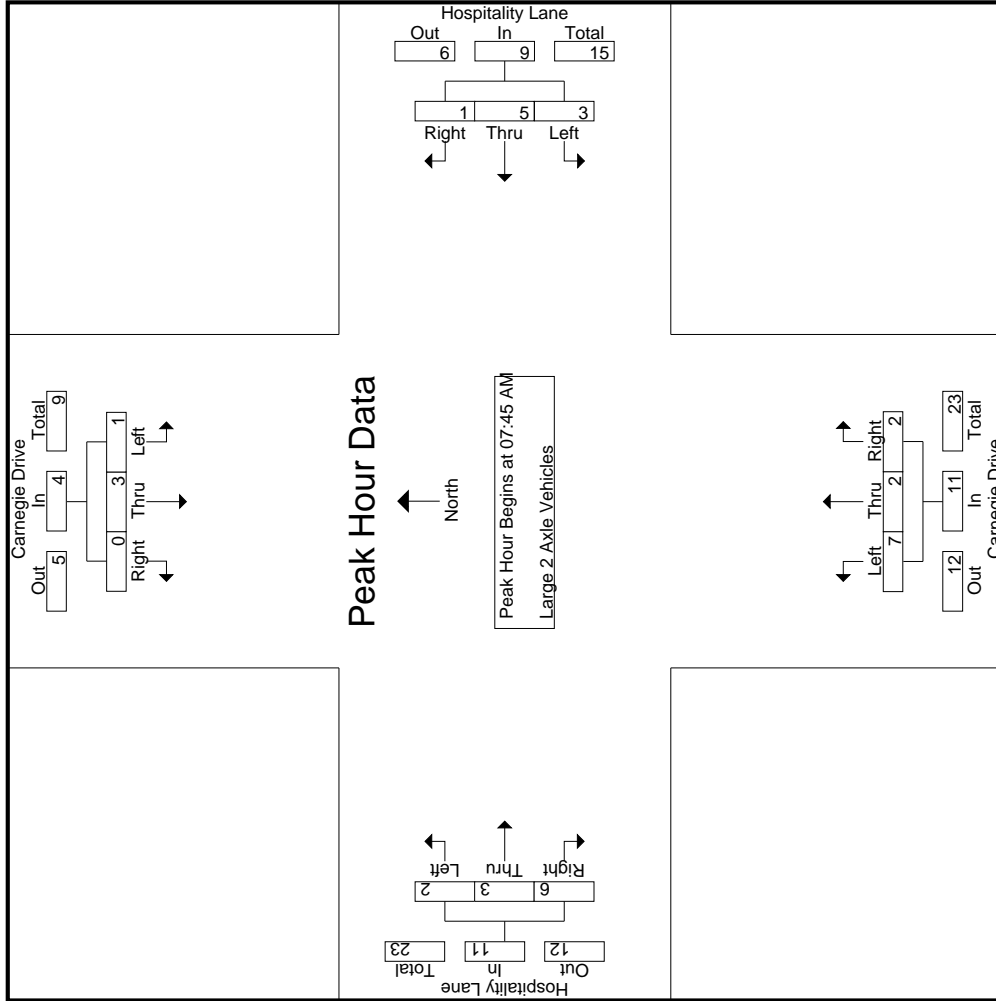
Start Time	Carnegie Drive Southbound					Hospitality Lane Westbound					Carnegie Drive Northbound					Hospitality Lane Eastbound								
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
07:45 AM	1	1	0	0	2	2	2	1	0	5	5	2	2	1	9	2	3	6	1	11	2	27	27	29
08:00 AM	0	1	0	0	1	1	1	0	0	2	1	0	0	0	1	0	0	0	0	0	0	4	4	4
08:15 AM	0	0	0	0	0	0	0	0	0	0	3	0	1	1	4	2	0	3	0	5	1	10	10	11
08:30 AM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	2	2	2
Total Volume	1	3	0	0	4	3	5	1		9	7	2	2		11	2	3	6		11	6	11	11	10
% App. Total	.25	.75	.00	.00	.500	.33.3	55.6	11.1		23	63.6	18.2	18.2		26.2	18.2	27.3	54.5		37.7	4.7	95.3	95.3	
PHF	.250	.750	.000	.000	.500	.375	.625	.250		.450	.583	.250	.500		.688	.250	.375	.500		.550	.500	.550	.550	.795

Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:45 AM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Carnegie Drive
 E/W: Hospitality Lane
 Weather: Clear

File Name : 15-SBCCAHOAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Carnegie Drive
 E/W: Hospitality Lane
 Weather: Clear

File Name : 15-SBCCAHOAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Carnegie Drive Southbound			Hospitality Lane Westbound			Carnegie Drive Northbound			Hospitality Lane Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1	Peak Hour for Each Approach Begins at:													
	07:45 AM													
+0 mins.	1	1	0	2	2	1	5	2	0	0	1	0	2	1
+15 mins.	0	1	0	1	1	0	2	1	0	0	0	0	1	0
+30 mins.	0	0	0	0	2	0	2	1	2	1	2	0	4	5
+45 mins.	0	1	0	0	0	0	0	3	0	1	0	0	4	5
Total Volume	1	3	0	3	5	1	9	7	2	2	3	6	11	11
% App. Total	25	75	0	33.3	55.6	11.1	63.6	18.2	18.2	27.3	54.5	54.5	68.8	55.0
PHF	.250	.750	.000	.375	.625	.250	.583	.250	.500	.375	.500	.500	.688	.550

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Carnegie Drive
 E/W: Hospitality Lane
 Weather: Clear

File Name : 15-SBCCAHOAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 3 Axle Vehicles

Start Time	Carnegie Drive Southbound				Hospitality Lane Westbound				Carnegie Drive Northbound				Hospitality Lane Eastbound				Exclu. Total	Inclu. Total	Int. Total				
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left				Thru	Right	RTOR	App. Total
07:00 AM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0	3	1	1	4	1	6	7
07:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	3	0	0	4	0	5	5
07:30 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	2
07:45 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	4	4
Total	0	1	0	0	1	0	5	0	0	5	0	0	0	0	0	1	9	1	1	11	1	17	18
08:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	1	1	1	0	3	0	0	3	1	5	6
08:15 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	0	5	5
08:30 AM	0	0	0	0	0	1	3	0	0	4	1	0	0	1	0	2	2	1	0	3	0	8	8
08:45 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	1	0	0	1	0	2	2
Total	0	0	0	0	0	1	7	0	0	8	1	0	1	1	2	0	9	1	0	10	1	20	21
Grand Total	0	1	0	0	1	1	12	0	0	13	1	0	1	1	2	1	18	2	1	21	2	37	39
Approach %	0	100	0	0	2.7	7.7	92.3	0	0	35.1	50	0	50	0	5.4	4.8	85.7	9.5	0	56.8	5.1	94.9	0
Total %	0	2.7	0	0	2.7	2.7	32.4	0	0	35.1	2.7	0	2.7	0	5.4	2.7	48.6	5.4	0	56.8	5.1	94.9	0

3.1-428

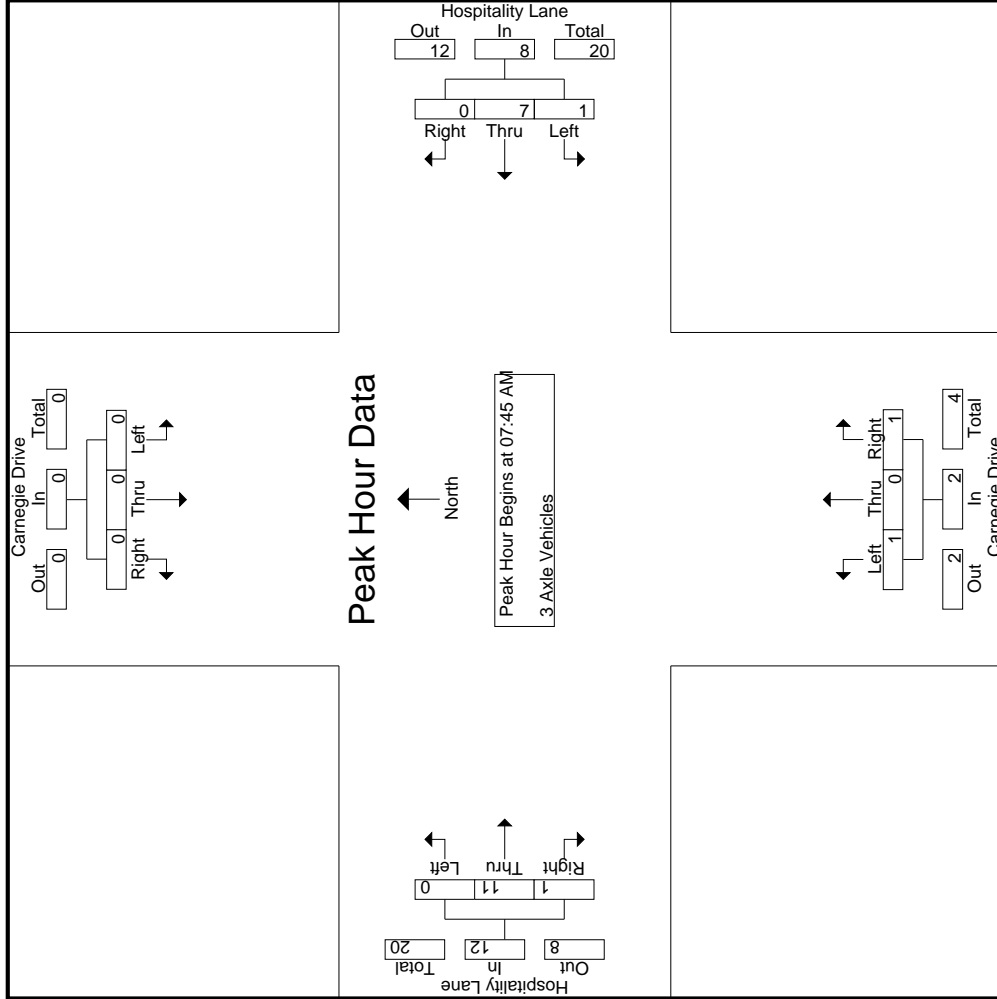
Start Time	Carnegie Drive Southbound				Hospitality Lane Westbound				Carnegie Drive Northbound				Hospitality Lane Eastbound				Exclu. Total	Inclu. Total	Int. Total					
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left				Thru	Right	RTOR	App. Total	
07:45 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4
08:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	1	0	0	3	0	3	5	
08:15 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	3	0	3	5	
08:30 AM	0	0	0	0	0	1	3	0	0	4	1	0	0	1	0	0	2	1	0	3	0	3	5	
Total Volume	0	0	0	0	0	1	7	0	0	8	1	0	1	1	2	0	9	1	0	11	1	12	22	
% App. Total	0	0	0	0	0	12.5	87.5	0	0	50	50	0	50	0	91.7	0	91.7	8.3	0	8.3	0	8.3	22	
PHF	.000	.000	.000	.000	.000	.250	.583	.000	.000	.500	.250	.000	.250	.000	.500	.000	.917	.250	.000	.917	.250	1.00	.688	

Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:45 AM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Carnegie Drive
 E/W: Hospitality Lane
 Weather: Clear

File Name : 15-SBCCAHOAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
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City of San Bernardino
 N/S: Carnegie Drive
 E/W: Hospitality Lane
 Weather: Clear

File Name : 15-SBCCAHOAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Carnegie Drive Southbound			Hospitality Lane Westbound			Carnegie Drive Northbound			Hospitality Lane Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	07:45 AM			07:45 AM			07:45 AM			07:45 AM				
+0 mins.	0	0	0	0	1	0	0	0	0	0	0	0	0	3
+15 mins.	0	0	0	0	1	0	0	0	1	0	0	0	0	3
+30 mins.	0	0	0	0	2	0	0	0	0	0	0	0	0	3
+45 mins.	0	0	0	1	3	0	1	0	0	0	0	2	1	3
Total Volume	0	0	0	12.5	87.5	0	50	0	1	0	11	0	1	12
% App. Total	.000	.000	.000	.250	.583	.000	.250	.000	.500	.000	.917	.250	.000	1.000
PHF														

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File Name : 15-SBCCAHOAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 4+ Axle Trucks

Start Time	Carnegie Drive Southbound				Hospitality Lane Westbound				Carnegie Drive Northbound				Hospitality Lane Eastbound			
	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR
07:00 AM	0	0	1	0	1	0	0	0	0	0	1	1	1	0	0	1
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	2
07:45 AM	0	0	0	0	0	1	0	0	1	0	0	0	1	0	0	3
Total	0	0	1	0	1	1	0	0	2	0	1	1	3	0	1	6
08:00 AM	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	4	0	0	0	4	0	1	0
08:30 AM	0	0	0	0	0	1	0	0	2	0	0	0	2	0	1	2
08:45 AM	0	1	0	0	0	0	0	0	2	0	0	0	2	1	0	2
Total	0	1	0	0	0	1	0	0	9	0	0	0	9	1	1	5
Grand Total	0	1	1	0	1	2	0	0	11	0	1	1	12	1	2	11
Approach %	0	50	50		33.3	66.7	0		91.7	0	8.3		38.7	7.1	14.3	78.6
Total %	0	3.2	3.2		6.5	6.5	0		35.5	0	3.2		38.7	3.2	6.5	35.5
App. Total																
Exclu. Total																
Inclu. Total																
Int. Total																

3.1-431

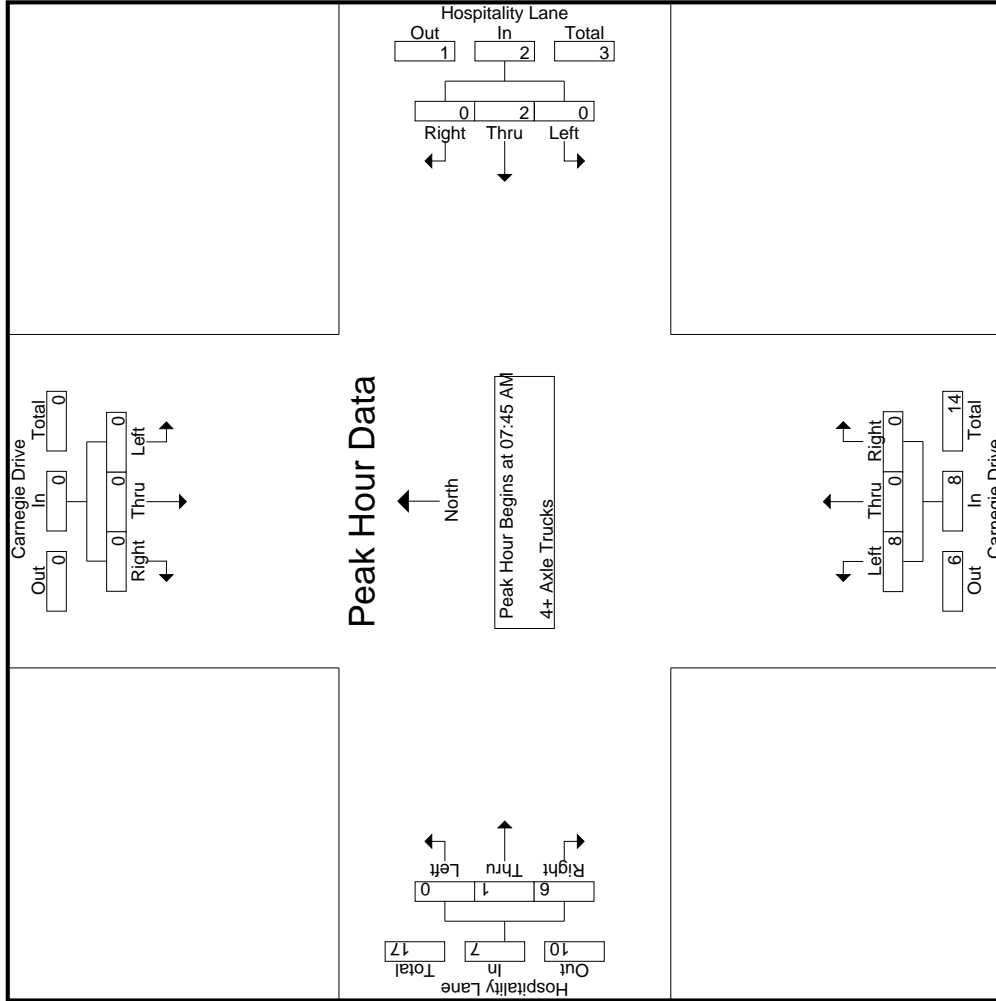
Start Time	Carnegie Drive Southbound				Hospitality Lane Westbound				Carnegie Drive Northbound				Hospitality Lane Eastbound			
	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR
07:45 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	4	0	0	0	4	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	2	0	1	0	2	0	1	0
Total Volume	0	0	0	0	0	0	0	0	8	0	0	0	8	0	1	6
% App. Total	0	0	0	0	0	0	0	0	100	0	0	0	0	0	14.3	85.7
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.500	.000	.000	.000	.250	.500	.583	.708

Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 07:45 AM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Carnegie Drive
 E/W: Hospitality Lane
 Weather: Clear

File Name : 15-SBCCAHOAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Carnegie Drive
 E/W: Hospitality Lane
 Weather: Clear

File Name : 15-SBCCAHOAM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Carnegie Drive Southbound			Hospitality Lane Westbound			Carnegie Drive Northbound			Hospitality Lane Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	07:45 AM													
+0 mins.	0	0	0	0	1	0	0	1	0	0	0	0	0	3
+15 mins.	0	0	0	0	0	0	0	1	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	4	0	0	0	0	0	0	1
+45 mins.	0	0	0	0	1	0	2	0	0	0	1	2	0	3
Total Volume	0	0	0	0	2	0	8	0	0	0	1	6	0	7
% App. Total	0	0	0	0	100	0	100	0	0	0	14.3	85.7	0	7
PHF	.000	.000	.000	.000	.500	.000	.500	.000	.000	.000	.250	.500	.000	.583

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City of San Bernardino
 N/S: Carnegie Drive
 E/W: Hospitality Lane
 Weather: Clear

File Name : 15-SBCCAHOPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

Start Time	Carnegie Drive Southbound					Hospitality Lane Westbound					Carnegie Drive Northbound					Hospitality Lane Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	11	109	29	16	149	87	122	22	4	231	125	17	16	9	158	23	133	43	3	199	32	737	769
04:15 PM	16	86	24	14	126	82	108	22	6	212	89	17	25	11	131	28	169	52	12	249	43	718	761
04:30 PM	20	140	17	8	177	94	94	18	4	206	105	18	16	7	139	17	210	47	12	274	31	796	827
04:45 PM	21	98	23	11	142	98	78	24	1	200	79	25	22	7	126	34	200	59	11	293	30	761	791
Total	68	433	93	49	594	361	402	86	15	849	398	77	79	34	554	102	712	201	38	1015	136	3012	3148
05:00 PM	25	180	22	4	227	139	120	32	4	291	72	8	22	13	102	31	187	58	9	276	30	896	926
05:15 PM	22	113	23	11	158	125	120	44	16	289	60	19	12	5	91	32	197	55	7	284	39	822	861
05:30 PM	23	85	16	11	124	90	114	19	1	223	98	17	13	7	128	32	232	36	12	300	31	775	806
05:45 PM	21	78	24	14	123	86	122	6	0	214	105	17	15	7	137	22	195	41	13	258	34	732	766
Total	91	456	85	40	632	440	476	101	21	1017	335	61	62	32	458	117	811	190	41	1118	134	3225	3359
Grand Total	159	889	178	89	1226	801	878	187	36	1866	733	138	141	66	1012	219	1523	391	79	2133	270	6237	6507
Approach %	13	72.5	14.5			42.9	47.1	10			72.4	13.6	13.9			10.3	71.4	18.3					
Total %	2.5	14.3	2.9			19.7	14.1	3			11.8	2.2	2.3			3.5	24.4	6.3			4.1	95.9	
Passenger Vehicles	155	885	175		1301	798	863	184		1881	711	133	140		1050	217	1506	370		2172	0	0	6404
% Passenger Vehicles	97.5	99.6	98.3	96.6	98.9	99.6	98.3	98.4	100	98.9	97	96.4	99.3	100	97.4	99.1	98.9	94.6	100	98.2	0	0	98.4
Large 2 Axle Vehicles	4	2	2		10	3	7	0		10	11	3	0		14	2	4	15		21	0	0	55
% Large 2 Axle Vehicles	2.5	0.2	1.1	2.2	0.8	0.4	0.8	0	0	0.5	1.5	2.2	0	0	1.3	0.9	0.3	3.8	0	0.9	0	0	0.8
3 Axle Vehicles	0	0	1		2	0	8	3		11	1	0	0		1	0	13	3		16	0	0	30
% 3 Axle Vehicles	0	0	0.6	1.1	0.2	0	0.9	1.6	0	0.6	0.1	0	0	0	0.1	0	0.9	0.8	0	0.7	0	0	0.5
4+ Axle Trucks	0	2	0		2	0	0	0		2	10	2	1		13	0	0	3		3	0	0	18
% 4+ Axle Trucks	0	0.2	0	0	0.2	0	0	0	0	0	1.4	1.4	0.7	0	1.2	0	0	0.8	0	0.1	0	0	0.3

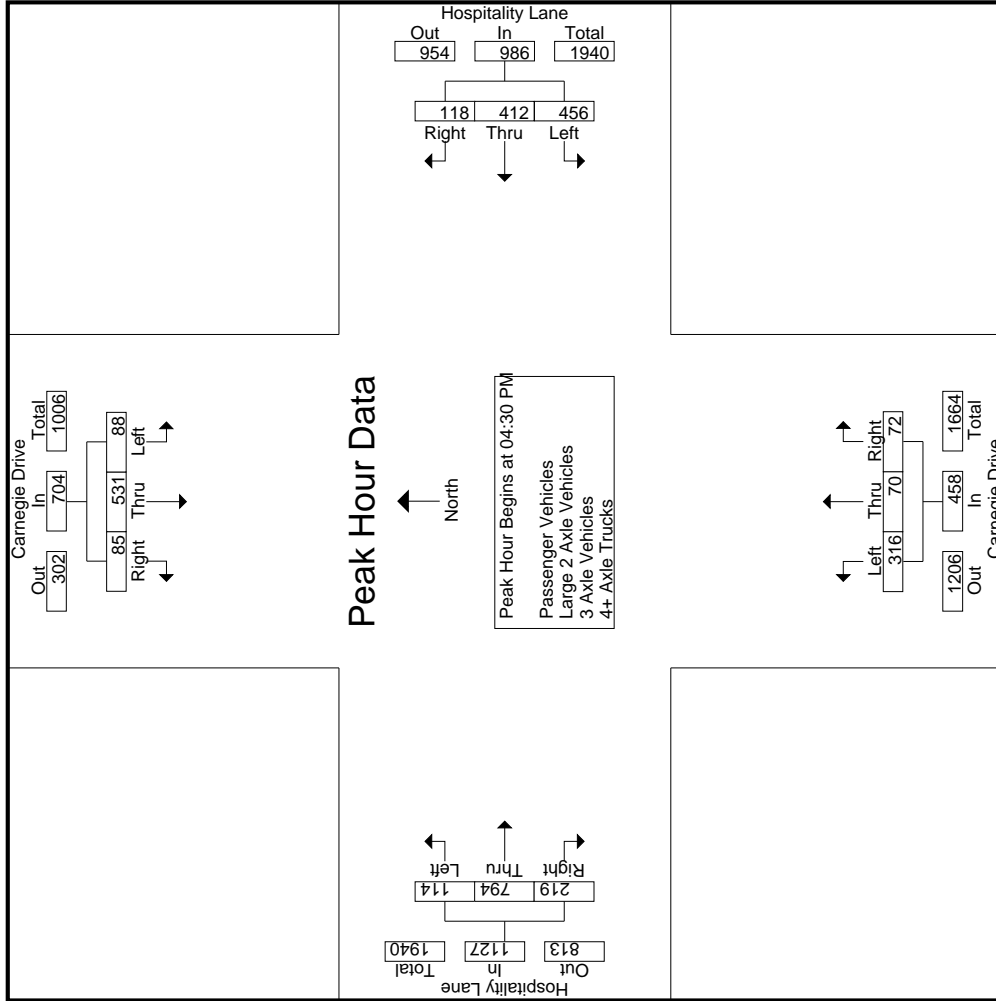
Start Time	Carnegie Drive Southbound					Hospitality Lane Westbound					Carnegie Drive Northbound					Hospitality Lane Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:30 PM	20	140	17		177	94	94	18		206	105	18	16		139	17	210	47		274			796
04:45 PM	21	98	23		142	98	78	24		200	79	25	22		126	34	200	59		293			761
05:00 PM	25	180	22		227	139	120	32		289	120	120	8		102	31	187	58		276			896
05:15 PM	22	113	23		158	125	120	44		223	60	19	12		91	32	197	55		284			822
Total Volume	88	531	85		704	456	412	118		986	316	70	72		458	114	794	219		1127			3275
% App. Total	12.5	75.4	12.1		12.1	46.2	41.8	12		15.7	69	15.3	15.7		19.4	10.1	70.5	19.4					
PHF	.880	.738	.924		.775	.820	.858	.670		.847	.752	.700	.818		.824	.838	.945	.928		.962			.914

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:30 PM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Carnegie Drive
 E/W: Hospitality Lane
 Weather: Clear

File Name : 15-SBCCAHOPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



Counts Unlimited
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 (951) 268-6268

City of San Bernardino
 N/S: Carnegie Drive
 E/W: Hospitality Lane
 Weather: Clear

File Name : 15-SBCCAHOPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Carnegie Drive Southbound			Hospitality Lane Westbound			Carnegie Drive Northbound			Hospitality Lane Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	04:30 PM			05:00 PM			04:00 PM			04:45 PM				
+0 mins.	20	140	17	177	120	32	291	125	17	16	34	200	59	293
+15 mins.	21	98	23	142	120	44	289	89	17	25	31	187	58	276
+30 mins.	25	180	22	227	90	19	223	105	18	16	32	197	55	284
+45 mins.	22	113	23	158	86	6	214	79	25	22	32	232	36	300
Total Volume	88	531	85	704	440	101	1017	398	77	79	129	816	208	1153
% App. Total	12.5	75.4	12.1	43.3	46.8	9.9	71.8	13.9	14.3	11.2	70.8	18	18	1153
PHF	.880	.738	.924	.775	.791	.574	.874	.796	.770	.790	.949	.879	.881	.961

Counts Unlimited
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City of San Bernardino
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 Weather: Clear

File Name : 15-SBCCAHOPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Passenger Vehicles

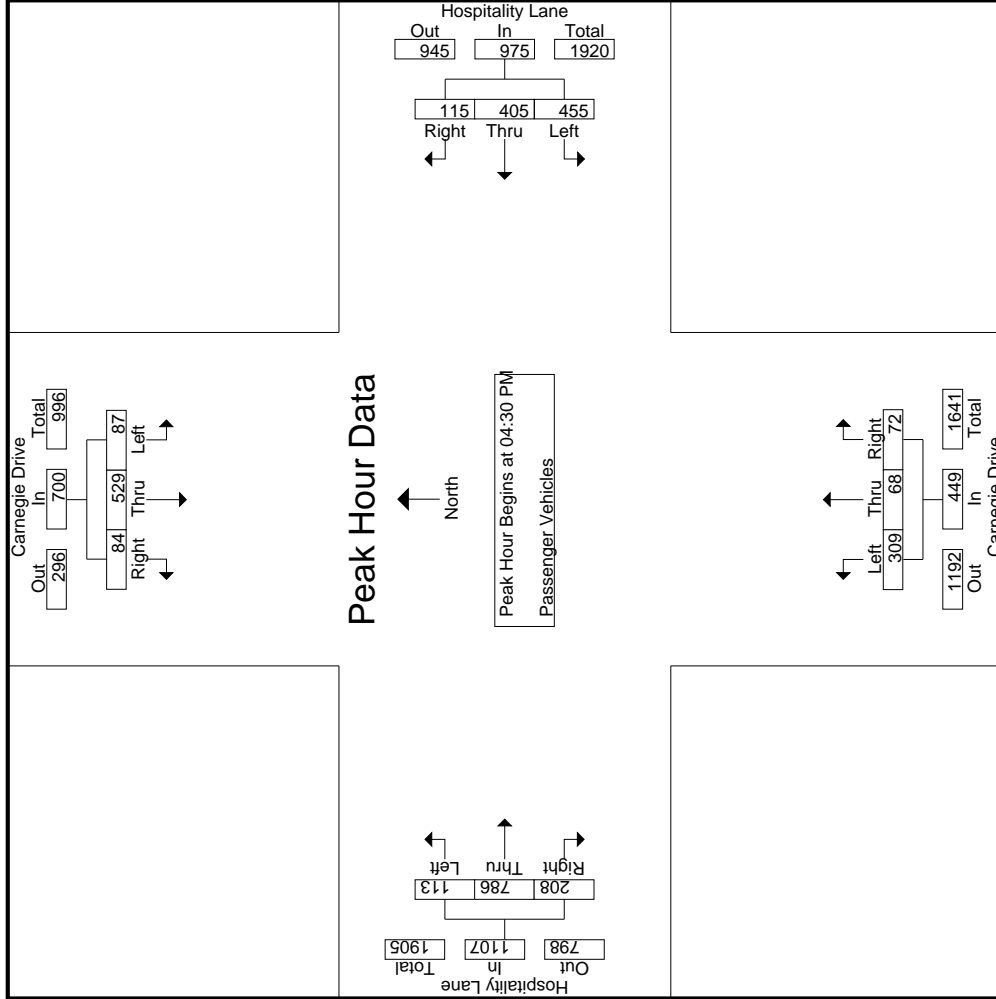
Start Time	Carnegie Drive Southbound					Hospitality Lane Westbound					Carnegie Drive Northbound					Hospitality Lane Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	10	109	28	15	147	87	118	22	4	227	123	17	16	9	156	23	132	38	3	193	31	723	754
04:15 PM	14	86	24	14	124	80	106	22	6	208	87	16	24	11	127	27	165	51	12	243	43	702	745
04:30 PM	20	138	16	7	174	94	92	18	4	204	103	17	16	7	136	17	208	43	12	268	30	782	812
04:45 PM	21	98	23	11	142	98	77	22	1	197	76	25	22	7	123	34	198	57	11	289	30	751	781
Total	65	431	91	47	587	359	393	84	15	836	389	75	78	34	542	101	703	189	38	993	134	2958	3092
05:00 PM	24	180	22	4	226	139	119	32	4	290	71	8	22	13	101	30	187	57	9	274	30	891	921
05:15 PM	22	113	23	11	158	124	117	43	16	284	59	18	12	5	89	32	193	51	7	276	39	807	846
05:30 PM	23	83	16	11	122	90	113	19	1	222	91	15	13	7	119	32	230	34	12	296	31	759	790
05:45 PM	21	78	23	13	122	86	121	6	0	213	101	17	15	7	133	22	193	39	13	254	33	722	755
Total	90	454	84	39	628	439	470	100	21	1009	322	58	62	32	442	116	803	181	41	1100	133	3179	3312
Grand Total	155	885	175	86	1215	798	863	184	36	1845	711	133	140	66	984	217	1506	370	79	2093	267	6137	6404
Approach %	12.8	72.8	14.4		43.3	46.8	10			30.1	72.3	13.5	14.2		16	10.4	72	17.7		34.1	4.2	95.8	
Total %	2.5	14.4	2.9		19.8	13	14.1	3			11.6	2.2	2.3			3.5	24.5	6					

Start Time	Carnegie Drive Southbound					Hospitality Lane Westbound					Carnegie Drive Northbound					Hospitality Lane Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:30 PM	20	138	16		174	94	92	18		204	103	17	16		16	17	208	43		268		268	782
04:45 PM	21	98	23		142	98	77	22		197	76	25	22		22	34	198	57		289		289	751
05:00 PM	24	180	22		226	139	119	32		290	71	8	22		22	30	187	57		274		274	891
05:15 PM	22	113	23		158	124	117	43		284	59	18	12		12	32	193	51		276		276	807
Total Volume	87	529	84		700	455	405	115		975	309	68	72		72	113	786	208		1107		1107	3231
% App. Total	12.4	75.6	12		46.7	41.5	11.8			68.8	15.1	16			18.8	10.2	71	18.8					
PHF	.906	.735	.913		.774	.818	.851	.669		.841	.750	.680	.818		.825	.831	.945	.912		.958		.958	.907

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Carnegie Drive
 E/W: Hospitality Lane
 Weather: Clear

File Name : 15-SBCCAHOPM
 Site Code : 05117141
 Start Date : 3/2/2017
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City of San Bernardino
 N/S: Carnegie Drive
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File Name : 15-SBCCAHOPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Carnegie Drive Southbound				Hospitality Lane Westbound				Carnegie Drive Northbound				Hospitality Lane Eastbound			
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																
Peak Hour for Each Approach Begins at:																
	04:30 PM				04:30 PM				04:30 PM				04:30 PM			
+0 mins.	20	138	16	174	94	92	18	204	103	17	16	136	17	208	43	268
+15 mins.	21	98	23	142	98	77	22	197	76	25	22	123	34	198	57	289
+30 mins.	24	180	22	226	139	119	32	290	71	8	22	101	30	187	57	274
+45 mins.	22	113	23	158	124	117	43	284	59	18	12	89	32	193	51	276
Total Volume	87	529	84	700	455	405	115	975	309	68	72	449	113	786	208	1107
% App. Total	12.4	75.6	12		46.7	41.5	11.8		68.8	15.1	16		10.2	71	18.8	
PHF	.906	.735	.913	.774	.818	.851	.669	.841	.750	.680	.818	.825	.831	.945	.912	.958

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City of San Bernardino
 N/S: Carnegie Drive
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 Weather: Clear

File Name : 15-SBCCAHOPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- Large 2 Axle Vehicles

Start Time	Carnegie Drive Southbound				Hospitality Lane Westbound				Carnegie Drive Northbound				Hospitality Lane Eastbound				Exclu. Total	Inclu. Total	Int. Total			
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left				Thru	Right	RTOR
04:00 PM	1	0	0	0	1	0	3	0	0	3	2	0	0	0	2	0	0	4	0	4	0	10
04:15 PM	2	0	0	0	2	2	1	0	0	3	2	0	0	0	2	1	1	2	0	2	0	9
04:30 PM	0	2	1	1	3	0	1	0	0	1	0	0	0	0	0	0	1	4	0	4	1	8
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	2
Total	3	2	1	1	6	2	5	0	0	7	4	0	0	0	4	1	2	9	0	12	1	29
05:00 PM	1	0	0	0	1	0	1	0	0	1	1	0	0	0	1	1	0	2	0	2	0	5
05:15 PM	0	0	0	0	0	1	1	0	0	2	0	1	0	0	1	0	1	0	2	2	0	5
05:30 PM	0	0	0	0	0	0	0	0	0	0	3	2	0	0	5	0	1	2	0	3	0	8
05:45 PM	0	0	1	1	1	0	0	0	0	0	3	0	0	0	3	0	0	2	0	2	1	7
Total	1	0	1	1	2	1	2	0	0	3	7	3	0	0	10	1	2	6	0	9	1	24
Grand Total	4	2	2	2	8	3	7	0	0	10	11	3	0	0	14	2	4	15	0	21	2	53
Approch %	50	25	25			30	70				78.6	21.4			26.4	9.5	19	71.4		39.6	3.6	96.4
Total %	7.5	3.8	3.8		15.1	5.7	13.2			18.9	20.8	5.7			26.4	3.8	7.5	28.3		39.6	3.6	96.4

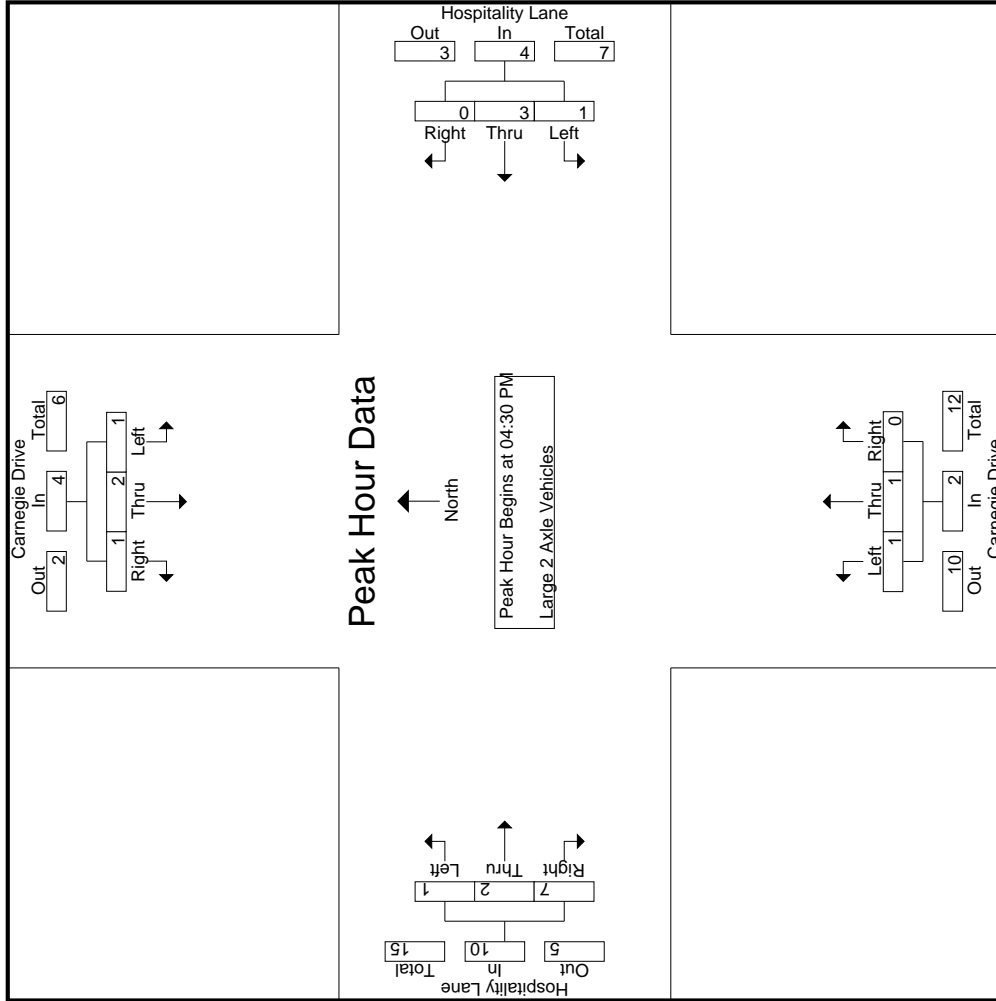
Start Time	Carnegie Drive Southbound				Hospitality Lane Westbound				Carnegie Drive Northbound				Hospitality Lane Eastbound				Exclu. Total	Inclu. Total	Int. Total			
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left				Thru	Right	RTOR
04:30 PM	0	2	1		3	0	1			1	0	0			0	0	1			0	4	8
04:45 PM	0	0	0		0	0	0			0	0	0			0	0	0			0	0	2
05:00 PM	1	0	0		1	0	1			1	1	0			1	1	0			0	2	5
05:15 PM	0	0	0		0	1	1			2	0	0			2	0	1			0	2	5
Total Volume	1	2	1		4	1	3			4	1	1			2	1	2			2	7	20
% App. Total	.25	.50	.25		.333	.25	.75			.50	.25	.50			.50	.25	.75			.625	.625	
PHF	.250	.250	.250		.333	.250	.750			.500	.250	.250			.500	.250	.583			.625	.625	

Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:30 PM

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 PO Box 1178
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City of San Bernardino
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File Name : 15-SBCCAHOPM
 Site Code : 05117141
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File Name : 15-SBCCAHOPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Carnegie Drive Southbound			Hospitality Lane Westbound			Carnegie Drive Northbound			Hospitality Lane Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	04:30 PM			04:30 PM			04:30 PM			04:30 PM				
+0 mins.	0	2	1	0	1	0	0	1	0	0	0	0	0	4
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	2
+30 mins.	1	0	0	0	1	0	1	1	1	0	0	0	1	2
+45 mins.	0	0	0	1	1	0	0	2	1	0	0	1	1	2
Total Volume	1	2	1	1	3	0	4	4	1	1	0	2	2	10
% App. Total	.25	.50	.25	.25	.75	.00	.50	.50	.25	.50	.00	.25	.25	.625
PHF	.250	.250	.250	.333	.250	.000	.500	.500	.250	.250	.000	.250	.500	.625

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Carnegie Drive
 E/W: Hospitality Lane
 Weather: Clear

File Name : 15-SBCCAHOPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 3 Axle Vehicles

Start Time	Carnegie Drive Southbound					Hospitality Lane Westbound					Carnegie Drive Northbound					Hospitality Lane Eastbound								
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total	
04:00 PM	0	0	1	1	1	0	1	0	0	1	0	0	0	0	0	0	0	1	1	0	2	1	4	5
04:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	3	1	0	4	0	5	5	
04:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	2	2	
04:45 PM	0	0	0	0	0	0	1	2	0	3	1	0	0	0	1	0	2	0	0	2	0	6	6	
Total	0	0	1	1	1	0	4	2	0	6	1	0	0	0	1	0	7	2	0	9	1	17	18	
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
05:15 PM	0	0	0	0	0	0	2	1	0	3	0	0	0	0	0	0	3	1	0	4	0	7	7	
05:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	2	2	
05:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	3	3	
Total	0	0	0	0	0	0	4	1	0	5	0	0	0	0	0	0	6	1	0	7	0	12	12	
Grand Total	0	0	1	1	1	0	8	3	0	11	1	0	0	0	1	0	13	3	0	16	1	29	30	
Approch %	0	0	100		3.4	0	72.7	27.3		37.9	100	0	0		3.4	0	81.2	18.8		55.2	3.3	96.7		
Total %	0	0	3.4			0	27.6	10.3			3.4	0	0			0	44.8	10.3						

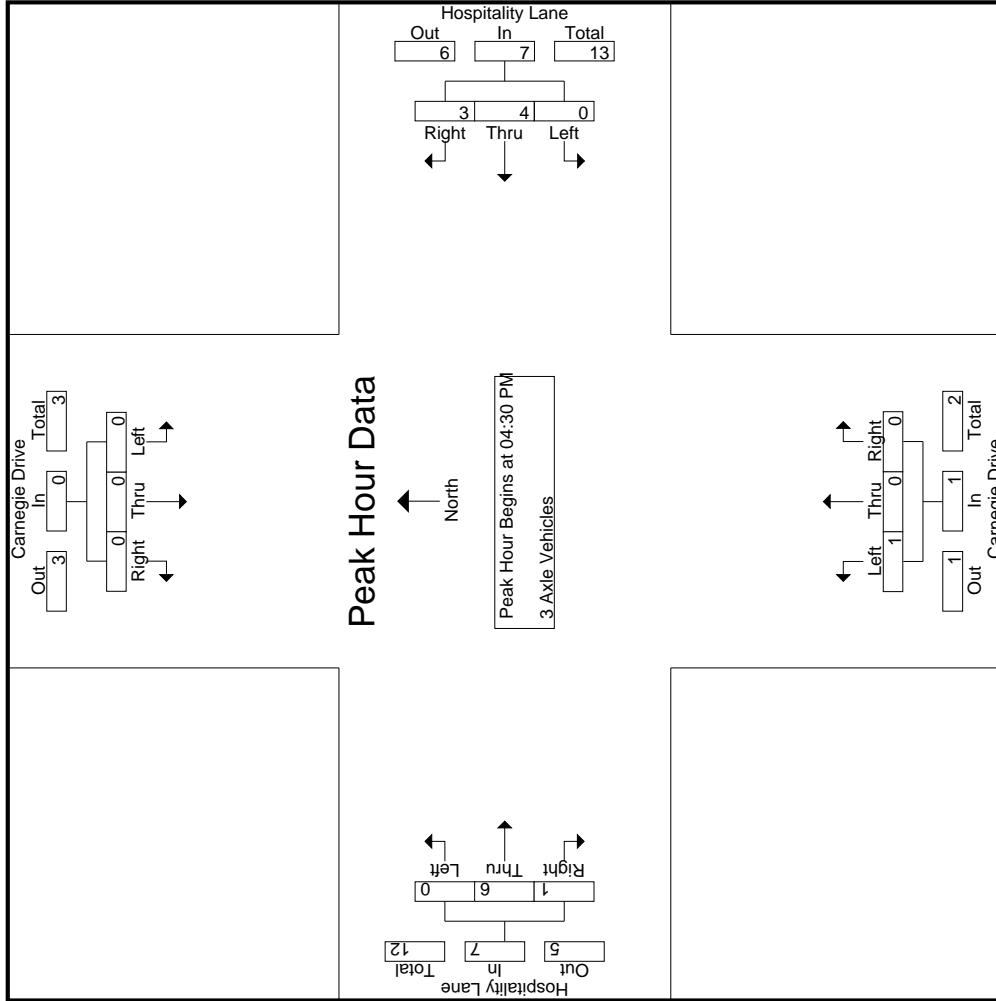
Start Time	Carnegie Drive Southbound					Hospitality Lane Westbound					Carnegie Drive Northbound					Hospitality Lane Eastbound							
	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	2	6
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	2	1	3	0	3	0	0	0	0	3	1	0	4	0	7	7
Total Volume	0	0	0	0	0	0	0	4	0	4	1	7	0	0	1	0	6	1	0	7	0	15	15
% App. Total	0	0	0	0	0	0	57.1	42.9		42.9	100	0	0		0	0	85.7	14.3		14.3			
PHF	.000	.000	.000	.000	.000	.000	.500	.375		.583	.250	.000	.000		.250	.000	.500	.250		.438		.536	

Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:30 PM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Carnegie Drive
 E/W: Hospitality Lane
 Weather: Clear

File Name : 15-SBCCAHOPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 2



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 PO Box 1178
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 (951) 268-6268

City of San Bernardino
 N/S: Carnegie Drive
 E/W: Hospitality Lane
 Weather: Clear

File Name : 15-SBCCAHOPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Carnegie Drive Southbound			Hospitality Lane Westbound			Carnegie Drive Northbound			Hospitality Lane Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1	04:30 PM													
Peak Hour for Each Approach Begins at:	04:30 PM													
+0 mins.	0	0	0	0	1	0	0	0	0	0	1	0	0	1
+15 mins.	0	0	0	0	1	2	1	0	0	1	0	2	0	2
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	2	1	0	0	0	0	3	1	0	4
Total Volume	0	0	0	0	4	3	1	0	0	1	6	1	0	7
% App. Total	0	0	0	0	57.1	42.9	100	0	0	0	85.7	14.3	0	7
PHF	.000	.000	.000	.000	.500	.375	.250	.000	.000	.000	.500	.250	.000	.438

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 PO Box 1178
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City of San Bernardino
 N/S: Carnegie Drive
 E/W: Hospitality Lane
 Weather: Clear

File Name : 15-SBCCAHOPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 1

Groups Printed- 4+ Axle Trucks

Start Time	Carnegie Drive Southbound				Hospitality Lane Westbound				Carnegie Drive Northbound				Hospitality Lane Eastbound			
	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR	Left	Thru	Right	RTOR
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	1	1	0	2	0	0	2
04:30 PM	0	0	0	0	0	0	0	0	2	1	0	0	3	0	1	0
04:45 PM	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	2
Total	0	0	0	0	0	0	0	0	4	2	1	0	7	0	1	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2
05:30 PM	0	2	0	0	0	0	0	0	4	0	0	0	4	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0
Total	0	2	0	0	0	0	0	0	6	0	0	0	6	0	0	2
Grand Total	0	2	0	0	0	0	0	0	10	2	1	0	13	0	0	3
Approach %	0	100	0	0	0	0	0	0	76.9	15.4	7.7	0	72.2	0	100	16.7
Total %	0	11.1	0	0	0	0	0	0	55.6	11.1	5.6	0	0	0	16.7	0

3.1-446

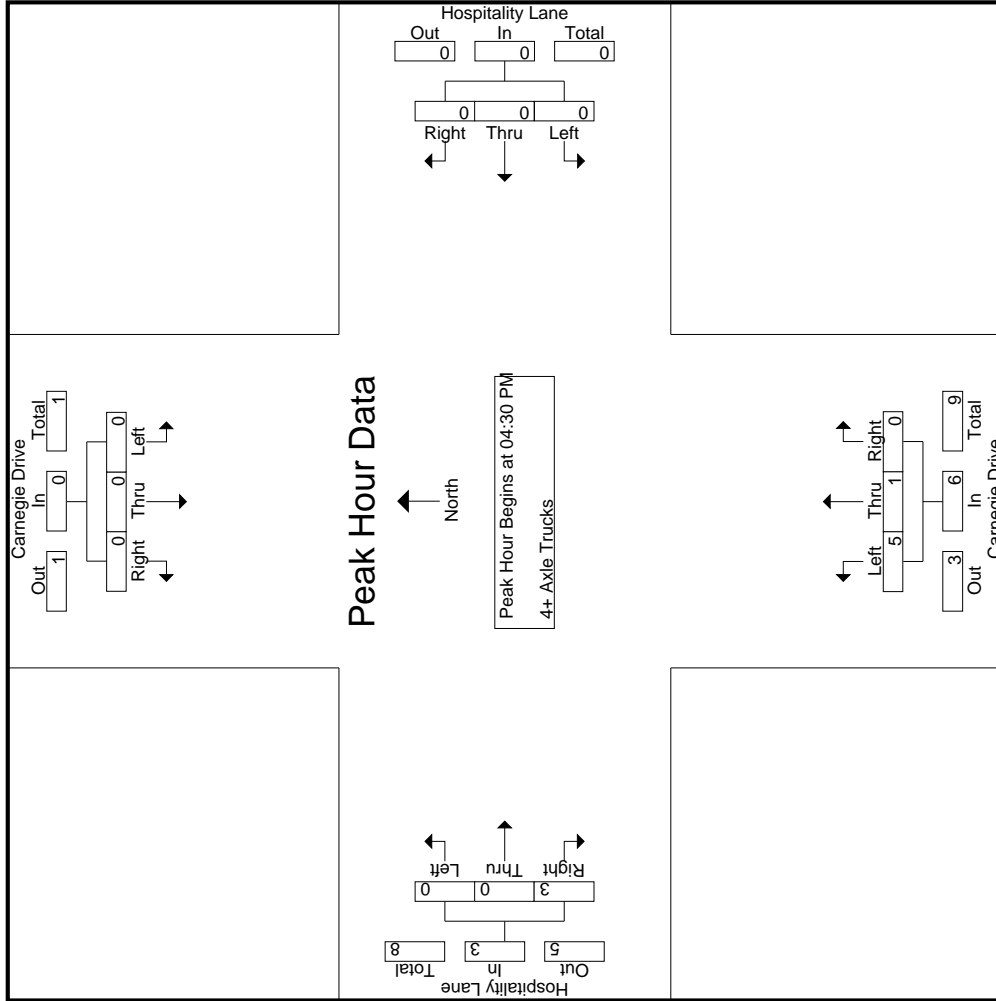
Start Time	Carnegie Drive Southbound				Hospitality Lane Westbound				Carnegie Drive Northbound				Hospitality Lane Eastbound			
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	2	2	0	0	1	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	5	5	1	0	6	0	0	3
% App. Total	0	0	0	0	0	0	0	0	83.3	16.7	0	0	0	0	0	100
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.625	.250	.000	.000	.500	.000	.375	.375

Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 04:30 PM

Counts Unlimited
 PO Box 1178
 Corona, CA 92878
 (951) 268-6268

City of San Bernardino
 N/S: Carnegie Drive
 E/W: Hospitality Lane
 Weather: Clear

File Name : 15-SBCCAHOPM
 Site Code : 05117141
 Start Date : 3/2/2017
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City of San Bernardino
 N/S: Carnegie Drive
 E/W: Hospitality Lane
 Weather: Clear

File Name : 15-SBCCAHOPM
 Site Code : 05117141
 Start Date : 3/2/2017
 Page No : 3

Start Time	Carnegie Drive Southbound			Hospitality Lane Westbound			Carnegie Drive Northbound			Hospitality Lane Eastbound			App. Total	Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1														
Peak Hour for Each Approach Begins at:														
	04:30 PM			04:30 PM			04:30 PM			04:30 PM				
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	1
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	3
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	100
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.375

Location: San Bernardino
 N/S: Carnegie Drive
 E/W: Hospitality Lane



Date: 3/2/2017
 Day: Thursday

PEDESTRIANS

	North Leg Carnegie Drive	East Leg Hospitality Lane	South Leg Carnegie Drive	West Leg Hospitality Lane	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	1	0	1	0	2
7:30 AM	1	0	0	0	1
7:45 AM	0	0	1	0	1
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	1	0	1	0	2
8:45 AM	0	0	1	0	1
TOTAL VOLUMES:	3	0	4	0	7

	North Leg Carnegie Drive	East Leg Hospitality Lane	South Leg Carnegie Drive	West Leg Hospitality Lane	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	1	0	0	0	1
4:30 PM	1	0	1	0	2
4:45 PM	1	1	2	0	4
5:00 PM	2	1	0	0	3
5:15 PM	3	0	1	0	4
5:30 PM	0	0	0	0	0
5:45 PM	4	1	1	0	6
TOTAL VOLUMES:	12	3	5	0	20

Location: San Bernardino
 N/S: Carnegie Drive
 E/W: Hospitality Lane



Date: 3/2/2017
 Day: Thursday

BICYCLES

	North Leg Carnegie Drive	East Leg Hospitality Lane	South Leg Carnegie Drive	West Leg Hospitality Lane	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	1	0	1
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	0	0	1	0	1

	North Leg Carnegie Drive	East Leg Hospitality Lane	South Leg Carnegie Drive	West Leg Hospitality Lane	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	2	0	0	0	2
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	1	0	0	0	1
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	3	0	0	0	3

Counts Unlimited, Inc.

PO Box 1178
 Corona, CA 92878
 Phone: 951-268-6268
 Site Code: 051-17141

City of San Bernardino
 Hospitality Lane
 E/ Waterman Avenue
 24 Hour Directional Classification Count
 email: counts@countsunlimited.com

Eastbound		Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
Start Time	Bikes													
03/07/17	1	39	8	1	2	1	0	0	2	0	0	0	0	54
01:00	0	17	3	1	1	1	0	0	2	0	0	0	0	25
02:00	2	25	13	1	2	3	0	0	1	0	0	1	0	48
03:00	3	44	10	0	3	5	0	1	6	0	0	0	0	72
04:00	7	111	28	1	9	6	0	1	3	0	0	0	0	166
05:00	6	191	53	1	12	4	0	3	1	0	0	0	0	271
06:00	8	375	111	2	29	8	0	7	5	0	0	0	0	545
07:00	9	668	128	2	44	12	0	5	1	0	0	0	0	869
08:00	9	660	166	12	56	7	0	7	4	0	0	0	0	921
09:00	8	642	170	5	61	10	0	7	7	0	0	0	0	910
10:00	10	634	237	4	52	13	0	3	4	0	0	0	0	957
11:00	2	929	253	3	64	7	0	4	9	0	0	0	0	1271
12 PM	9	1011	224	15	56	14	0	6	9	0	1	0	0	1345
13:00	8	904	237	7	36	4	0	8	8	0	0	0	0	1212
14:00	3	769	204	6	51	2	0	7	5	0	0	0	0	1047
15:00	1	799	209	7	57	2	0	8	3	1	0	0	0	1087
16:00	6	913	186	5	49	2	0	6	1	0	1	0	0	1169
17:00	24	805	151	8	34	18	1	15	0	0	0	0	1	1057
18:00	3	868	227	2	37	3	0	7	2	0	0	0	0	1149
19:00	2	678	150	3	33	0	0	7	4	0	0	0	0	877
20:00	1	429	91	4	10	2	0	4	2	0	1	0	0	544
21:00	2	250	48	2	6	1	0	0	0	0	0	0	0	309
22:00	4	130	19	1	3	4	0	1	0	0	2	0	0	164
23:00	0	89	16	0	2	0	0	0	0	0	0	0	0	107
Total	128	11980	2942	93	709	129	1	107	79	1	5	1	1	16176
Percent	0.8%	74.1%	18.2%	0.6%	4.4%	0.8%	0.0%	0.7%	0.5%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	11:00	11:00	08:00	11:00	10:00		06:00	11:00			02:00		11:00
Vol.	10	929	253	12	64	13		7	9			1		1271
PM Peak	17:00	12:00	13:00	12:00	15:00	17:00	17:00	17:00	12:00	15:00	22:00		17:00	12:00
Vol.	24	1011	237	15	57	18	1	15	9	1	2		1	1345
Grand Total	128	11980	2942	93	709	129	1	107	79	1	5	1	1	16176
Percent	0.8%	74.1%	18.2%	0.6%	4.4%	0.8%	0.0%	0.7%	0.5%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
 Corona, CA 92878
 Phone: 951-268-6268
 Site Code: 051-17141

City of San Bernardino
 Hospitality Lane
 E/ Waterman Avenue
 24 Hour Directional Classification Count
 email: counts@countsunlimited.com

Westbound														
Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/07/17	1	68	10	1	2	1	0	0	1	0	0	0	0	84
01:00	0	55	4	0	0	2	0	0	1	0	0	0	0	62
02:00	1	35	5	0	0	1	0	0	3	0	0	0	0	45
03:00	0	35	8	0	0	1	0	0	1	0	0	0	0	45
04:00	1	53	21	0	4	1	1	0	0	0	0	0	0	81
05:00	2	97	35	1	7	2	0	0	1	0	0	0	0	145
06:00	2	270	72	1	15	1	0	8	5	0	0	0	0	374
07:00	4	567	90	3	14	5	0	6	1	0	0	0	0	690
08:00	6	575	119	2	31	7	0	10	2	0	0	0	0	752
09:00	2	527	138	8	34	4	0	5	4	0	0	0	0	722
10:00	2	584	152	1	33	3	0	5	2	1	0	0	0	783
11:00	7	698	171	7	34	5	0	4	4	0	1	0	0	931
12 PM	9	853	174	3	25	6	0	8	0	0	1	0	0	1079
13:00	8	803	135	2	31	5	0	8	2	1	0	0	0	995
14:00	5	693	134	6	24	3	0	7	3	0	0	0	0	875
15:00	3	736	125	3	43	7	0	7	4	0	0	0	0	928
16:00	10	821	172	4	36	6	0	7	0	0	0	0	0	1056
17:00	11	808	123	5	23	12	0	8	3	0	0	1	0	994
18:00	5	704	116	1	17	1	0	7	1	0	0	0	0	852
19:00	3	563	105	2	14	3	0	4	0	0	0	0	0	694
20:00	2	463	85	2	14	1	0	3	1	1	0	0	0	572
21:00	2	306	55	3	4	7	0	0	2	0	0	0	0	379
22:00	1	223	23	1	0	1	0	0	1	0	0	0	0	250
23:00	0	151	13	0	0	0	0	0	1	0	0	0	0	165
Total	87	10688	2085	56	405	85	1	97	43	3	2	1	0	13553
Percent	0.6%	78.9%	15.4%	0.4%	3.0%	0.6%	0.0%	0.7%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	11:00	09:00	09:00	08:00	04:00	08:00	06:00	10:00	11:00	11:00	11:00	11:00
Vol.	7	698	171	8	34	7	1	10	5	1	1	1	1	931
PM Peak	17:00	12:00	12:00	14:00	15:00	17:00	17:00	12:00	15:00	13:00	12:00	17:00	12:00	12:00
Vol.	11	853	174	6	43	12	1	8	4	1	1	1	1	1079
Grand Total	87	10688	2085	56	405	85	1	97	43	3	2	1	0	13553
Percent	0.6%	78.9%	15.4%	0.4%	3.0%	0.6%	0.0%	0.7%	0.3%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

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 Phone: 951-268-6268
 Site Code: 051-17141

City of San Bernardino
 Hospitality Lane
 E/ Waterman Avenue
 24 Hour Directional Classification Count
 email: counts@countsunlimited.com

Eastbound, Westbound														
Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/07/17	2	107	18	2	4	2	0	0	3	0	0	0	0	138
01:00	0	72	7	1	1	3	0	0	3	0	0	0	0	87
02:00	3	60	18	1	2	4	0	0	4	0	0	1	0	93
03:00	3	79	18	0	3	6	0	1	7	0	0	0	0	117
04:00	8	164	49	1	13	7	1	1	3	0	0	0	0	247
05:00	8	288	88	2	19	6	0	3	2	0	0	0	0	416
06:00	10	645	183	3	44	9	0	15	10	0	0	0	0	919
07:00	13	1235	218	5	58	17	0	11	2	0	0	0	0	1559
08:00	15	1235	285	14	87	14	0	17	6	0	0	0	0	1673
09:00	10	1169	308	13	95	14	0	12	11	0	0	0	0	1632
10:00	12	1218	389	5	85	16	0	8	6	1	0	0	0	1740
11:00	9	1627	424	10	98	12	0	8	13	0	1	0	0	2202
12 PM	18	1864	398	18	81	20	0	14	9	2	0	0	0	2424
13:00	16	1707	372	9	67	9	0	16	10	1	0	0	0	2207
14:00	8	1462	338	12	75	5	0	14	8	0	0	0	0	1922
15:00	4	1535	334	10	100	9	0	15	7	1	0	0	0	2015
16:00	16	1734	358	9	85	8	0	13	1	0	1	0	0	2225
17:00	35	1613	274	13	57	30	1	23	3	0	0	1	1	2051
18:00	8	1572	343	3	54	4	0	14	3	0	0	0	0	2001
19:00	5	1241	255	5	47	3	0	11	4	0	0	0	0	1571
20:00	3	892	176	6	24	3	0	7	3	1	1	0	0	1116
21:00	4	556	103	5	10	8	0	0	2	0	0	0	0	688
22:00	5	353	42	2	3	5	0	1	1	0	2	0	0	414
23:00	0	240	29	0	2	0	0	0	1	0	0	0	0	272
Total	215	22668	5027	149	1114	214	2	204	122	4	7	2	1	29729
Percent	0.7%	76.2%	16.9%	0.5%	3.7%	0.7%	0.0%	0.7%	0.4%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	11:00	11:00	08:00	11:00	07:00	04:00	08:00	11:00	10:00	11:00	02:00		11:00
Vol.	15	1627	424	14	98	17	1	17	13	1	1	1		2202
PM Peak	17:00	12:00	12:00	12:00	15:00	17:00	17:00	17:00	13:00	13:00	12:00	17:00	17:00	12:00
Vol.	35	1864	398	18	100	30	1	23	10	1	2	1	1	2424
Grand Total	215	22668	5027	149	1114	214	2	204	122	4	7	2	1	29729
Percent	0.7%	76.2%	16.9%	0.5%	3.7%	0.7%	0.0%	0.7%	0.4%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

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 Phone: 951-268-6268
 Site Code: 051-17141

City of San Bernardino
 Waterman Avenue
 N/ Park Center Drive South
 24 Hour Directional Classification Count
 email: counts@countsunlimited.com

Northbound														
Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/07/17	3	29	18	2	2	1	0	0	6	0	0	0	0	61
01:00	0	25	13	3	2	1	0	0	4	0	0	0	0	48
02:00	2	26	14	0	2	2	0	0	3	0	0	0	0	49
03:00	1	54	30	0	5	2	0	0	1	0	0	0	0	93
04:00	0	34	31	2	12	2	0	0	4	0	0	0	0	85
05:00	1	98	74	3	32	1	0	2	4	0	0	0	0	215
06:00	7	280	99	9	41	4	0	4	6	0	0	0	0	450
07:00	7	390	131	9	47	8	0	6	7	0	0	0	0	605
08:00	5	383	165	7	62	3	0	5	5	0	0	0	0	635
09:00	10	361	179	8	49	11	0	5	11	0	0	0	0	634
10:00	6	353	170	9	74	4	0	7	11	0	0	0	0	634
11:00	3	419	224	12	75	10	0	2	7	0	0	0	0	752
12 PM	4	459	240	9	66	9	0	2	8	0	0	0	0	797
13:00	7	551	227	9	57	9	0	2	10	0	0	0	0	872
14:00	4	494	190	9	54	5	0	4	9	0	0	0	0	769
15:00	3	446	211	4	68	11	0	4	3	0	0	0	0	753
16:00	5	691	258	4	67	4	0	7	6	0	0	0	0	1042
17:00	12	690	216	5	63	3	0	5	11	0	1	0	0	1006
18:00	3	297	157	5	30	6	0	4	7	0	0	0	0	509
19:00	3	197	100	4	22	6	0	0	8	0	0	0	0	340
20:00	7	142	66	5	20	4	0	0	7	1	1	0	0	253
21:00	2	118	63	1	11	2	0	1	6	0	0	0	0	204
22:00	4	74	44	2	7	4	0	0	2	0	0	0	0	137
23:00	3	51	31	0	7	3	0	1	4	0	0	0	0	100
Total	102	6662	2951	121	875	115	0	64	150	1	2	0	0	11043
Percent	0.9%	60.3%	26.7%	1.1%	7.9%	1.0%	0.0%	0.6%	1.4%	0.0%	0.0%	0.0%	0.0%	
AM Peak Vol.	09:00	11:00	11:00	11:00	11:00	09:00	10:00	09:00	09:00	11:00	11:00	11:00	11:00	11:00
PM Peak Vol.	17:00	16:00	16:00	12:00	15:00	15:00	15:00	17:00	17:00	20:00	17:00	17:00	16:00	16:00
Grand Total	102	6662	2951	121	875	115	0	64	150	1	2	0	0	11043
Percent	0.9%	60.3%	26.7%	1.1%	7.9%	1.0%	0.0%	0.6%	1.4%	0.0%	0.0%	0.0%	0.0%	

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 Waterman Avenue
 N/ Park Center Drive South
 24 Hour Directional Classification Count
 email: counts@countsunlimited.com

Southbound														
Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/07/17	2	58	1	3	1	0	0	1	5	0	0	0	0	71
01:00	0	41	5	1	2	0	0	0	5	0	0	0	0	54
02:00	4	30	8	2	2	6	0	6	8	0	0	0	0	66
03:00	3	51	9	0	0	4	0	3	13	0	0	0	0	83
04:00	2	122	21	1	6	0	0	1	7	0	0	0	0	160
05:00	5	132	41	1	6	4	0	2	5	0	1	0	0	197
06:00	4	220	65	3	14	5	0	7	8	0	0	0	0	326
07:00	7	552	112	9	24	7	0	6	8	1	0	0	0	726
08:00	9	535	109	9	27	7	0	8	10	0	0	0	0	714
09:00	5	489	113	5	36	8	0	5	15	0	0	0	0	676
10:00	8	557	131	5	34	5	0	6	14	0	0	0	0	760
11:00	12	651	148	8	40	8	0	3	18	0	0	0	0	888
12 PM	14	781	163	9	34	10	0	3	20	0	0	0	0	1034
13:00	9	741	130	8	43	7	0	3	16	0	0	0	0	957
14:00	2	627	151	3	31	8	0	2	10	0	0	0	0	834
15:00	6	762	189	4	33	7	0	6	16	1	0	0	0	1024
16:00	4	867	141	4	28	3	0	3	9	0	0	0	0	1059
17:00	8	824	134	6	23	3	0	2	7	1	0	0	0	1008
18:00	2	561	105	2	22	3	0	1	6	0	0	0	0	702
19:00	0	322	52	3	5	0	0	1	9	0	0	0	0	392
20:00	3	223	30	2	4	2	0	1	6	0	0	0	0	271
21:00	2	165	19	4	3	2	0	2	5	0	0	0	0	202
22:00	2	133	14	1	0	3	0	1	2	0	0	0	0	156
23:00	1	94	8	0	2	0	0	0	4	0	0	0	0	109
Total	114	9538	1899	93	420	102	0	73	226	3	1	0	0	12469
Percent	0.9%	76.5%	15.2%	0.7%	3.4%	0.8%	0.0%	0.6%	1.8%	0.0%	0.0%	0.0%	0.0%	
AM Peak Vol.	11:00	11:00	11:00	07:00	11:00	09:00	08:00	08:00	11:00	07:00	05:00			11:00
	12	651	148	9	40	8	1	8	18	1	1			888
PM Peak Vol.	12:00	16:00	15:00	12:00	13:00	12:00	15:00	15:00	12:00	15:00				16:00
	14	867	189	9	43	10	6	6	20	1				1059
Grand Total	114	9538	1899	93	420	102	0	73	226	3	1	0	0	12469
Percent	0.9%	76.5%	15.2%	0.7%	3.4%	0.8%	0.0%	0.6%	1.8%	0.0%	0.0%	0.0%	0.0%	

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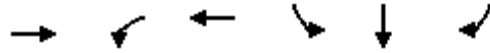
Northbound, Southbound														
Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Ax Double	5 Axle Double	>6 Ax Double	<6 Ax Multi	6 Axle Multi	>6 Ax Multi	Total
03/07/17	5	87	19	5	3	1	0	1	11	0	0	0	0	132
01:00	0	66	18	4	4	1	0	0	9	0	0	0	0	102
02:00	6	56	22	2	4	8	0	6	11	0	0	0	0	115
03:00	4	105	39	0	5	6	0	3	14	0	0	0	0	176
04:00	2	156	52	3	18	2	0	1	11	0	0	0	0	245
05:00	6	230	115	4	38	5	0	4	9	0	1	0	0	412
06:00	11	500	164	12	55	9	0	11	14	0	0	0	0	776
07:00	14	942	243	18	71	15	0	12	15	1	0	0	0	1331
08:00	14	918	274	16	89	10	0	13	15	0	0	0	0	1349
09:00	15	850	292	13	85	19	0	10	26	0	0	0	0	1310
10:00	14	910	301	14	108	9	0	13	25	0	0	0	0	1394
11:00	15	1070	372	20	115	18	0	5	25	0	0	0	0	1640
12 PM	18	1240	403	18	100	19	0	5	28	0	0	0	0	1831
13:00	16	1292	357	17	100	16	0	5	26	0	0	0	0	1829
14:00	6	1121	341	12	85	13	0	6	19	0	0	0	0	1603
15:00	9	1208	400	8	101	18	0	13	19	1	0	0	0	1777
16:00	9	1558	399	8	95	7	0	10	15	0	0	0	0	2101
17:00	20	1514	350	11	86	6	0	7	18	1	1	0	0	2014
18:00	5	858	262	7	52	9	0	5	13	0	0	0	0	1211
19:00	3	519	152	7	27	6	0	1	17	0	0	0	0	732
20:00	10	365	96	7	24	6	0	1	13	1	1	0	0	524
21:00	4	283	82	5	14	4	0	3	11	0	0	0	0	406
22:00	6	207	58	3	7	7	0	1	4	0	0	0	0	293
23:00	4	145	39	0	9	3	0	1	8	0	0	0	0	209
Total	216	16200	4850	214	1295	217	0	137	376	4	3	0	0	23512
Percent	0.9%	68.9%	20.6%	0.9%	5.5%	0.9%	0.0%	0.6%	1.6%	0.0%	0.0%	0.0%	0.0%	
AM Peak Vol.	09:00	11:00	11:00	11:00	11:00	09:00	08:00	08:00	09:00	07:00	05:00			11:00
PM Peak Vol.	17:00	16:00	12:00	12:00	15:00	12:00	15:00	15:00	12:00	15:00	17:00			16:00
Grand Total	216	16200	4850	214	1295	217	0	137	376	4	3	0	0	23512
Percent	0.9%	68.9%	20.6%	0.9%	5.5%	0.9%	0.0%	0.6%	1.6%	0.0%	0.0%	0.0%	0.0%	

APPENDIX 3.2:

EXISTING (2017) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Timings
1: I-215 SB Ramps & Auto Center Rd.

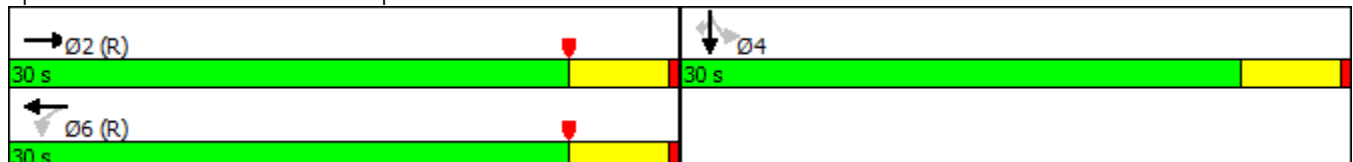


Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Configurations	↑↑		↑↑	↑	↑	↑
Traffic Volume (vph)	132	1	188	1037	66	344
Future Volume (vph)	132	1	188	1037	66	344
Turn Type	NA	Perm	NA	Perm	NA	Perm
Protected Phases	2		6		4	
Permitted Phases		6		4		4
Detector Phase	2	6	6	4	4	4
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	30.0	22.5	22.5	22.5	22.5	22.5
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0		5.0	5.0	5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	Max	Max	Max
Act Effct Green (s)	25.0		25.0	25.0	25.0	25.0
Actuated g/C Ratio	0.42		0.42	0.42	0.42	0.42
v/c Ratio	0.12		0.13	0.83	0.78	0.38
Control Delay	8.8		10.6	28.3	24.8	2.8
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	8.8		10.6	28.3	24.8	2.8
LOS	A		B	C	C	A
Approach Delay	8.8		10.6		20.9	
Approach LOS	A		B		C	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 2 (3%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 18.7
 Intersection Capacity Utilization 47.2%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 1: I-215 SB Ramps & Auto Center Rd.



HCM Signalized Intersection Capacity Analysis
1: I-215 SB Ramps & Auto Center Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017




















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑					↘	↙	↗
Traffic Volume (vph)	0	132	33	1	188	0	0	0	0	1037	66	344
Future Volume (vph)	0	132	33	1	188	0	0	0	0	1037	66	344
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		5.0			5.0					5.0	5.0	5.0
Lane Util. Factor		0.95			0.95					0.95	0.95	1.00
Frt		0.97			1.00					1.00	1.00	0.85
Flt Protected		1.00			1.00					0.95	0.96	1.00
Satd. Flow (prot)		3600			3600					1700	1800	1800
Flt Permitted		1.00			0.95					0.95	0.96	1.00
Satd. Flow (perm)		3600			3600					1700	1800	1800
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	140	35	1	200	0	0	0	0	1103	70	366
RTOR Reduction (vph)	0	20	0	0	0	0	0	0	0	0	0	214
Lane Group Flow (vph)	0	155	0	0	201	0	0	0	0	585	588	153
Turn Type		NA		Perm	NA					Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases				6						4		4
Actuated Green, G (s)		25.0			25.0					25.0	25.0	25.0
Effective Green, g (s)		25.0			25.0					25.0	25.0	25.0
Actuated g/C Ratio		0.42			0.42					0.42	0.42	0.42
Clearance Time (s)		5.0			5.0					5.0	5.0	5.0
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1500			1500					708	750	750
v/s Ratio Prot		0.04										
v/s Ratio Perm					0.06					c0.34	0.33	0.08
v/c Ratio		0.10			0.13					0.83	0.78	0.20
Uniform Delay, d1		10.7			10.8					15.6	15.2	11.2
Progression Factor		1.00			0.96					1.00	1.00	1.00
Incremental Delay, d2		0.1			0.2					10.6	8.0	0.6
Delay (s)		10.8			10.5					26.2	23.2	11.8
Level of Service		B			B					C	C	B
Approach Delay (s)		10.8			10.5			0.0			21.6	
Approach LOS		B			B			A			C	

Intersection Summary

HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	47.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	132	33	1	188	0	0	0	0	1037	66	344
Future Volume (veh/h)	0	132	33	1	188	0	0	0	0	1037	66	344
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1800	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	140	28	1	200	0				1153	0	261
Adj No. of Lanes	0	2	0	0	2	0				2	0	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1189	232	61	1397	0				1349	0	637
Arrive On Green	0.00	0.42	0.42	0.83	0.83	0.00				0.42	0.00	0.42
Sat Flow, veh/h	0	2944	558	2	3435	0				3238	0	1530
Grp Volume(v), veh/h	0	83	85	108	93	0				1153	0	261
Grp Sat Flow(s),veh/h/ln	0	1710	1702	1799	1556	0				1619	0	1530
Q Serve(g_s), s	0.0	1.8	1.8	0.0	0.7	0.0				19.4	0.0	7.2
Cycle Q Clear(g_c), s	0.0	1.8	1.8	0.7	0.7	0.0				19.4	0.0	7.2
Prop In Lane	0.00		0.33	0.01		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	713	709	810	648	0				1349	0	637
V/C Ratio(X)	0.00	0.12	0.12	0.13	0.14	0.00				0.85	0.00	0.41
Avail Cap(c_a), veh/h	0	713	709	810	648	0				1349	0	637
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	10.7	10.7	3.0	3.0	0.0				15.9	0.0	12.3
Incr Delay (d2), s/veh	0.0	0.3	0.3	0.3	0.5	0.0				7.1	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.9	0.9	0.4	0.3	0.0				9.8	0.0	3.3
LnGrp Delay(d),s/veh	0.0	11.1	11.1	3.3	3.4	0.0				22.9	0.0	14.3
LnGrp LOS		B	B	A	A					C		B
Approach Vol, veh/h		168			201						1414	
Approach Delay, s/veh		11.1			3.4						21.3	
Approach LOS		B			A						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		30.0		30.0		30.0						
Change Period (Y+Rc), s		5.0		5.0		5.0						
Max Green Setting (Gmax), s		25.0		25.0		25.0						
Max Q Clear Time (g_c+I1), s		3.8		21.4		2.7						
Green Ext Time (p_c), s		1.9		2.0		1.9						
Intersection Summary												
HCM 2010 Ctrl Delay			18.3									
HCM 2010 LOS			B									
Notes												

Timings

2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.

3/27/2017



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations	↶	↷↷	↷↷	↷	↶	↷	↷↷
Traffic Volume (vph)	69	1100	296	249	140	8	840
Future Volume (vph)	69	1100	296	249	140	8	840
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm
Protected Phases	5	2	6		8	8	
Permitted Phases				6			8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	8.0	8.0	8.0	5.0	5.0	5.0
Minimum Split (s)	8.5	39.0	13.0	13.0	10.0	10.0	10.0
Total Split (s)	9.8	39.0	29.2	29.2	21.0	21.0	21.0
Total Split (%)	16.3%	65.0%	48.7%	48.7%	35.0%	35.0%	35.0%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max
Act Effct Green (s)	6.0	34.0	28.1	28.1	16.0	16.0	16.0
Actuated g/C Ratio	0.10	0.57	0.47	0.47	0.27	0.27	0.27
v/c Ratio	0.45	0.59	0.19	0.28	0.18	0.17	0.89
Control Delay	27.5	8.6	12.1	8.1	18.3	18.1	31.2
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	10.7
Total Delay	27.5	8.9	12.1	8.1	18.3	18.1	41.9
LOS	C	A	B	A	B	B	D
Approach Delay		10.0	10.3			38.4	
Approach LOS		B	B			D	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 1 (2%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.89
 Intersection Signal Delay: 20.4
 Intersection LOS: C
 Intersection Capacity Utilization 71.4%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.
























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↖	↗↗			
Traffic Volume (vph)	69	1100	0	0	296	249	140	8	840	0	0	0
Future Volume (vph)	69	1100	0	0	296	249	140	8	840	0	0	0
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800	1700	1800	1800	1800	1800	1800
Total Lost time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	0.88			
Frbp, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.96	1.00			
Satd. Flow (prot)	1700	3600			3600	1800	1700	1800	3600			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.96	1.00			
Satd. Flow (perm)	1700	3600			3600	1800	1700	1800	3600			
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	76	1209	0	0	325	274	154	9	923	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	152	0	0	81	0	0	0
Lane Group Flow (vph)	76	1209	0	0	325	122	82	81	842	0	0	0
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	3.8	34.0			26.7	26.7	16.0	16.0	16.0			
Effective Green, g (s)	3.8	34.0			26.7	26.7	16.0	16.0	16.0			
Actuated g/C Ratio	0.06	0.57			0.44	0.44	0.27	0.27	0.27			
Clearance Time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Vehicle Extension (s)	2.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	107	2040			1602	801	453	480	960			
v/s Ratio Prot	0.04	c0.34			0.09		0.05	0.04				
v/s Ratio Perm						0.07			c0.23			
v/c Ratio	0.71	0.59			0.20	0.15	0.18	0.17	0.88			
Uniform Delay, d1	27.6	8.5			10.2	9.9	17.0	16.9	21.1			
Progression Factor	0.83	0.89			1.16	5.48	1.00	1.00	1.00			
Incremental Delay, d2	12.1	0.9			0.3	0.4	0.9	0.8	11.1			
Delay (s)	35.0	8.4			12.1	54.7	17.8	17.7	32.2			
Level of Service	C	A			B	D	B	B	C			
Approach Delay (s)		10.0			31.6			30.0			0.0	
Approach LOS		A			C			C			A	

Intersection Summary

HCM 2000 Control Delay	21.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	1100	0	0	296	249	140	8	840	0	0	0
Future Volume (veh/h)	69	1100	0	0	296	249	140	8	840	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1700	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	76	1209	0	0	325	192	160	0	764			
Adj No. of Lanes	1	2	0	0	2	1	2	0	2			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	97	1938	0	0	1534	686	863	0	816			
Arrive On Green	0.06	0.57	0.00	0.00	0.90	0.90	0.27	0.00	0.27			
Sat Flow, veh/h	1619	3510	0	0	3510	1530	3238	0	3060			
Grp Volume(v), veh/h	76	1209	0	0	325	192	160	0	764			
Grp Sat Flow(s),veh/h/ln	1619	1710	0	0	1710	1530	1619	0	1530			
Q Serve(g_s), s	2.8	14.2	0.0	0.0	0.7	1.0	2.3	0.0	14.6			
Cycle Q Clear(g_c), s	2.8	14.2	0.0	0.0	0.7	1.0	2.3	0.0	14.6			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	97	1938	0	0	1534	686	863	0	816			
V/C Ratio(X)	0.78	0.62	0.00	0.00	0.21	0.28	0.19	0.00	0.94			
Avail Cap(c_a), veh/h	170	1938	0	0	1534	686	863	0	816			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.87	0.87	1.00	0.00	1.00			
Uniform Delay (d), s/veh	27.8	8.7	0.0	0.0	1.7	1.8	17.0	0.0	21.5			
Incr Delay (d2), s/veh	5.1	1.5	0.0	0.0	0.3	0.9	0.5	0.0	19.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.4	7.0	0.0	0.0	0.3	0.5	1.1	0.0	8.3			
LnGrp Delay(d),s/veh	33.0	10.2	0.0	0.0	2.0	2.6	17.4	0.0	40.9			
LnGrp LOS	C	B			A	A	B		D			
Approach Vol, veh/h		1285			517			924				
Approach Delay, s/veh		11.6			2.3			36.8				
Approach LOS		B			A			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		39.0			7.1	31.9		21.0				
Change Period (Y+Rc), s		5.0			3.5	5.0		5.0				
Max Green Setting (Gmax), s		34.0			6.3	24.2		16.0				
Max Q Clear Time (g_c+I1), s		16.2			4.8	3.0		16.6				
Green Ext Time (p_c), s		10.4			0.0	11.6		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			18.4									
HCM 2010 LOS			B									
Notes												

Timings
3: E St. & Orange Show Rd.

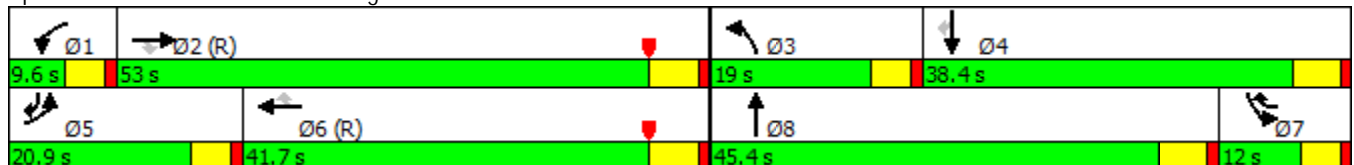


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↖↖	↑↑	↗	↖↖	↑↑	↗	↖	↑↑	↖↖	↑↑	↗
Traffic Volume (vph)	215	1206	460	59	338	61	162	168	42	126	42
Future Volume (vph)	215	1206	460	59	338	61	162	168	42	126	42
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8	7	4	5
Permitted Phases			2			6					4
Detector Phase	5	2	2	1	6	7	3	8	7	4	5
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0
Minimum Split (s)	9.6	39.4	39.4	9.6	39.4	9.6	9.6	38.4	9.6	38.4	9.6
Total Split (s)	20.9	53.0	53.0	9.6	41.7	12.0	19.0	45.4	12.0	38.4	20.9
Total Split (%)	17.4%	44.2%	44.2%	8.0%	34.8%	10.0%	15.8%	37.8%	10.0%	32.0%	17.4%
Yellow Time (s)	3.6	4.4	4.4	3.6	4.4	3.6	3.6	4.4	3.6	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4	4.6	5.4	4.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	Max	None	Max	None
Act Effct Green (s)	13.2	49.5	49.5	5.0	39.4	47.1	14.2	42.4	6.9	33.2	51.9
Actuated g/C Ratio	0.11	0.41	0.41	0.04	0.33	0.39	0.12	0.35	0.06	0.28	0.43
v/c Ratio	0.69	0.92	0.54	0.50	0.33	0.09	0.92	0.24	0.26	0.14	0.06
Control Delay	55.5	43.1	10.4	74.5	33.5	3.9	97.8	17.2	57.4	33.3	2.9
Queue Delay	0.0	13.8	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.5	57.0	10.8	74.5	33.5	3.9	97.8	17.2	57.4	33.3	2.9
LOS	E	E	B	E	C	A	F	B	E	C	A
Approach Delay		45.5			34.8			46.7		32.0	
Approach LOS		D			C			D		C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 92 (77%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 43.1
 Intersection Capacity Utilization 87.7%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service E

























Splits and Phases: 3: E St. & Orange Show Rd.



























HCM Signalized Intersection Capacity Analysis
3: E St. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	215	1206	460	59	338	61	162	168	113	42	126	42	
Future Volume (vph)	215	1206	460	59	338	61	162	168	113	42	126	42	
Ideal Flow (vphp)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800	
Total Lost time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95		0.97	0.95	1.00	
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99		1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	3200	3600	1800	3200	3600	1800	1700	3600		3200	3600	1800	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	3200	3600	1800	3200	3600	1800	1700	3600		3200	3600	1800	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	
Adj. Flow (vph)	244	1370	523	67	384	69	184	191	128	48	143	48	
RTOR Reduction (vph)	0	0	239	0	0	43	0	83	0	0	0	29	
Lane Group Flow (vph)	244	1370	284	67	384	26	184	236	0	48	143	19	
Confl. Peds. (#/hr)									2				
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov	
Protected Phases	5	2		1	6	7	3	8		7	4	5	
Permitted Phases			2			6						4	
Actuated Green, G (s)	13.2	47.7	47.7	4.0	38.5	44.4	14.2	42.4		5.9	34.1	47.3	
Effective Green, g (s)	13.2	47.7	47.7	4.0	38.5	44.4	14.2	42.4		5.9	34.1	47.3	
Actuated g/C Ratio	0.11	0.40	0.40	0.03	0.32	0.37	0.12	0.35		0.05	0.28	0.39	
Clearance Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6	
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	2.0	2.0	3.0		2.0	3.0	2.0	
Lane Grp Cap (vph)	352	1431	715	106	1155	666	201	1272		157	1023	709	
v/s Ratio Prot	c0.08	c0.38		0.02	0.11	0.00	c0.11	c0.07		c0.01	0.04	0.00	
v/s Ratio Perm			0.16			0.01						0.01	
v/c Ratio	0.69	0.96	0.40	0.63	0.33	0.04	0.92	0.19		0.31	0.14	0.03	
Uniform Delay, d1	51.4	35.2	25.9	57.3	31.0	24.2	52.3	26.9		55.1	32.0	22.3	
Progression Factor	0.94	1.02	1.37	1.10	1.06	1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2	3.2	11.9	1.1	8.3	0.7	0.0	39.7	0.3		0.4	0.3	0.0	
Delay (s)	51.6	47.9	36.6	71.1	33.4	24.2	92.0	27.2		55.5	32.3	22.3	
Level of Service	D	D	D	E	C	C	F	C		E	C	C	
Approach Delay (s)		45.6			37.1			50.9			34.9		
Approach LOS		D			D			D			C		
Intersection Summary													
HCM 2000 Control Delay			44.3									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.70										
Actuated Cycle Length (s)			120.0									Sum of lost time (s)	20.0
Intersection Capacity Utilization			87.7%									ICU Level of Service	E
Analysis Period (min)			15										
c Critical Lane Group													

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	215	1206	460	59	338	61	162	168	113	42	126	42
Future Volume (veh/h)	215	1206	460	59	338	61	162	168	113	42	126	42
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	244	1370	272	67	384	38	184	191	96	48	143	26
Adj No. of Lanes	2	2	1	2	2	1	1	2	0	2	2	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	289	1372	614	110	1165	605	183	746	360	163	940	570
Arrive On Green	0.20	0.80	0.80	0.07	0.68	0.68	0.12	0.33	0.33	0.05	0.28	0.28
Sat Flow, veh/h	2956	3420	1530	2956	3420	1530	1524	2238	1079	2956	3420	1530
Grp Volume(v), veh/h	244	1370	272	67	384	38	184	144	143	48	143	26
Grp Sat Flow(s),veh/h/ln	1478	1710	1530	1478	1710	1530	1524	1710	1607	1478	1710	1530
Q Serve(g_s), s	9.5	47.8	6.5	2.6	5.5	0.2	14.4	7.4	7.8	1.9	3.8	1.3
Cycle Q Clear(g_c), s	9.5	47.8	6.5	2.6	5.5	0.2	14.4	7.4	7.8	1.9	3.8	1.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.67	1.00		1.00
Lane Grp Cap(c), veh/h	289	1372	614	110	1165	605	183	570	536	163	941	570
V/C Ratio(X)	0.84	1.00	0.44	0.61	0.33	0.06	1.01	0.25	0.27	0.30	0.15	0.05
Avail Cap(c_a), veh/h	402	1372	614	123	1165	605	183	570	536	182	941	570
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.62	0.62	0.62	0.94	0.94	0.94	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.4	11.8	7.8	54.7	13.5	4.7	52.8	29.1	29.3	54.5	32.9	24.0
Incr Delay (d2), s/veh	5.4	18.9	1.4	3.8	0.7	0.2	68.2	1.1	1.2	0.4	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	24.5	2.8	1.1	2.7	0.3	9.5	3.6	3.6	0.8	1.8	0.6
LnGrp Delay(d),s/veh	52.8	30.7	9.2	58.5	14.2	4.9	121.0	30.2	30.5	54.8	33.3	24.2
LnGrp LOS	D	C	A	E	B	A	F	C	C	D	C	C
Approach Vol, veh/h		1886			489			471			217	
Approach Delay, s/veh		30.5			19.6			65.8			36.9	
Approach LOS		C			B			E			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.1	53.5	19.0	38.4	16.3	46.3	12.0	45.4				
Change Period (Y+Rc), s	4.6	5.4	4.6	5.4	4.6	5.4	5.4	* 5.4				
Max Green Setting (Gmax), s	5.0	47.6	14.4	33.0	16.3	36.3	7.4	* 40				
Max Q Clear Time (g_c+I1), s	4.6	49.8	16.4	5.8	11.5	7.5	3.9	9.8				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.9	0.2	21.3	0.3	1.6				
Intersection Summary												
HCM 2010 Ctrl Delay			34.6									
HCM 2010 LOS			C									
Notes												

Timings
4: Arrowhead Av. & Orange Show Rd.

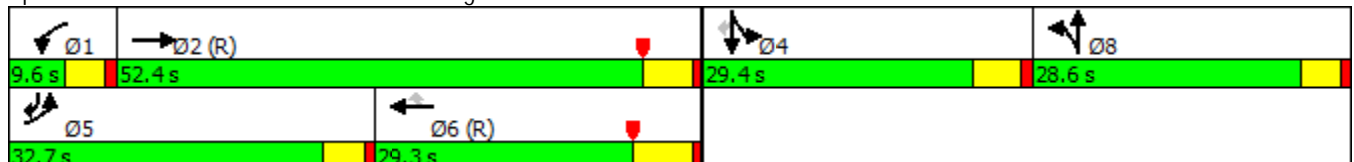


Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	286	984	7	290	84	3	86	11	192
Future Volume (vph)	286	984	7	290	84	3	86	11	192
Turn Type	Prot	NA	Prot	NA	Perm	NA	Split	NA	pm+ov
Protected Phases	5	2	1	6		8	4	4	5
Permitted Phases					6				4
Detector Phase	5	2	1	6	6	8	4	4	5
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	28.4	9.6	29.2	29.2	28.6	29.4	29.4	9.6
Total Split (s)	32.7	52.4	9.6	29.3	29.3	28.6	29.4	29.4	32.7
Total Split (%)	27.3%	43.7%	8.0%	24.4%	24.4%	23.8%	24.5%	24.5%	27.3%
Yellow Time (s)	3.6	4.4	3.6	5.2	5.2	3.6	4.4	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	6.2	6.2	4.6	5.4	5.4	4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag				Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				Yes
Recall Mode	None	C-Max	None	C-Max	C-Max	Max	Max	Max	None
Act Effect Green (s)	25.6	54.7	5.0	25.6	25.6	24.0	24.0	24.0	50.4
Actuated g/C Ratio	0.21	0.46	0.04	0.21	0.21	0.20	0.20	0.20	0.42
v/c Ratio	0.90	0.69	0.11	0.43	0.19	0.02	0.16	0.16	0.25
Control Delay	83.7	33.8	59.0	43.7	2.2	26.6	41.2	41.1	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.7	33.8	59.0	43.7	2.2	26.6	41.2	41.1	2.0
LOS	F	C	E	D	A	C	D	D	A
Approach Delay		44.9		34.9		26.6		15.2	
Approach LOS		D		C		C		B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 86 (72%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.90
 Intersection Signal Delay: 38.5
 Intersection LOS: D
 Intersection Capacity Utilization 66.3%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 4: Arrowhead Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
4: Arrowhead Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017





























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↖	↖	↗		↖	↗	↖
Traffic Volume (vph)	286	984	17	7	290	84	0	3	5	86	11	192
Future Volume (vph)	286	984	17	7	290	84	0	3	5	86	11	192
Ideal Flow (vphp)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	6.2	6.2		4.6		5.4	5.4	4.6
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00		0.99		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00		0.95	0.96	1.00
Satd. Flow (prot)	1700	3600		1700	3600	1800		1800		1700	1800	1800
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00		0.95	0.96	1.00
Satd. Flow (perm)	1700	3600		1700	3600	1800		1800		1700	1800	1800
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	325	1118	19	8	330	95	0	3	6	98	12	218
RTOR Reduction (vph)	0	1	0	0	0	75	0	5	0	0	0	128
Lane Group Flow (vph)	325	1136	0	8	330	20	0	4	0	55	56	90
Confl. Peds. (#/hr)									6			7
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		8	8		4	4	5
Permitted Phases						6						4
Actuated Green, G (s)	25.6	51.0		1.0	25.6	25.6		24.0		24.0	24.0	49.6
Effective Green, g (s)	25.6	51.0		1.0	25.6	25.6		24.0		24.0	24.0	49.6
Actuated g/C Ratio	0.21	0.42		0.01	0.21	0.21		0.20		0.20	0.20	0.41
Clearance Time (s)	4.6	5.4		4.6	6.2	6.2		4.6		5.4	5.4	4.6
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0		3.0		3.0	3.0	2.0
Lane Grp Cap (vph)	362	1530		14	768	384		360		340	360	744
v/s Ratio Prot	c0.19	c0.32		0.00	0.09			c0.00		c0.03	0.03	0.03
v/s Ratio Perm						0.01						0.02
v/c Ratio	0.90	0.74		0.57	0.43	0.05		0.01		0.16	0.16	0.12
Uniform Delay, d1	45.9	29.0		59.3	40.9	37.6		38.5		39.7	39.6	21.7
Progression Factor	1.49	1.21		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	13.7	1.7		30.5	1.8	0.3		0.1		1.0	0.9	0.0
Delay (s)	82.3	36.8		89.8	42.6	37.8		38.5		40.7	40.6	21.8
Level of Service	F	D		F	D	D		D		D	D	C
Approach Delay (s)		46.9			42.4			38.5			28.1	
Approach LOS		D			D			D			C	

Intersection Summary		
HCM 2000 Control Delay	43.2	HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio	0.49	
Actuated Cycle Length (s)	120.0	Sum of lost time (s) 20.8
Intersection Capacity Utilization	66.3%	ICU Level of Service C
Analysis Period (min)	15	
c Critical Lane Group		

HCM 2010 Signalized Intersection Summary
4: Arrowhead Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

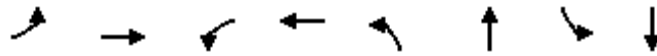
3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (veh/h)	286	984	17	7	290	84	0	3	5	86	11	192
Future Volume (veh/h)	286	984	17	7	290	84	0	3	5	86	11	192
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	325	1118	18	8	330	75	0	3	6	107	0	124
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	342	1436	23	16	736	329	324	107	213	648	0	626
Arrive On Green	0.42	0.83	0.83	0.01	0.22	0.22	0.00	0.20	0.20	0.20	0.00	0.20
Sat Flow, veh/h	1619	3445	55	1619	3420	1530	1619	533	1067	3238	0	1514
Grp Volume(v), veh/h	325	555	581	8	330	75	0	0	9	107	0	124
Grp Sat Flow(s),veh/h/ln	1619	1710	1790	1619	1710	1530	1619	0	1600	1619	0	1514
Q Serve(g_s), s	23.2	18.4	18.4	0.6	10.1	4.9	0.0	0.0	0.5	3.3	0.0	6.3
Cycle Q Clear(g_c), s	23.2	18.4	18.4	0.6	10.1	4.9	0.0	0.0	0.5	3.3	0.0	6.3
Prop In Lane	1.00		0.03	1.00		1.00	1.00		0.67	1.00		1.00
Lane Grp Cap(c), veh/h	342	713	746	16	736	329	324	0	320	648	0	626
V/C Ratio(X)	0.95	0.78	0.78	0.51	0.45	0.23	0.00	0.00	0.03	0.17	0.00	0.20
Avail Cap(c_a), veh/h	379	713	746	67	736	329	324	0	320	648	0	626
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.31	0.31	0.31	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	34.0	7.3	7.3	59.1	40.9	38.9	0.0	0.0	38.6	39.7	0.0	22.6
Incr Delay (d2), s/veh	14.1	2.7	2.6	9.0	2.0	1.6	0.0	0.0	0.2	0.5	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.6	8.5	8.9	0.3	5.0	2.2	0.0	0.0	0.3	1.5	0.0	2.8
LnGrp Delay(d),s/veh	48.1	10.1	9.9	68.2	42.9	40.5	0.0	0.0	38.8	40.3	0.0	23.3
LnGrp LOS	D	B	A	E	D	D			D	D		C
Approach Vol, veh/h		1461			413			9			231	
Approach Delay, s/veh		18.5			42.9			38.8			31.2	
Approach LOS		B			D			D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.8	56.2		29.4	30.0	32.0		28.6				
Change Period (Y+Rc), s	4.6	* 6.2		5.4	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.0	* 47		24.0	28.1	23.1		24.0				
Max Q Clear Time (g_c+I1), s	2.6	20.4		8.3	25.2	12.1		2.5				
Green Ext Time (p_c), s	0.0	15.0		0.6	0.2	8.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			24.7									
HCM 2010 LOS			C									
Notes												

Timings

5: Washington Av./Washington Av. & Orange Show Rd.

3/27/2017

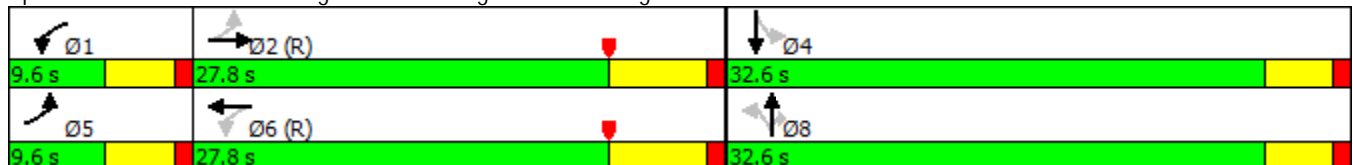


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↕	↖	↕		↕		↕
Traffic Volume (vph)	49	1022	2	371	6	3	3	1
Future Volume (vph)	49	1022	2	371	6	3	3	1
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	9.6	23.2	32.6	32.6	32.6	32.6
Total Split (s)	9.6	27.8	9.6	27.8	32.6	32.6	32.6	32.6
Total Split (%)	13.7%	39.7%	13.7%	39.7%	46.6%	46.6%	46.6%	46.6%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effect Green (s)	62.6	60.3	62.6	54.0		13.6		13.6
Actuated g/C Ratio	0.89	0.86	0.89	0.77		0.19		0.19
v/c Ratio	0.03	0.36	0.00	0.15		0.03		0.03
Control Delay	4.6	8.4	6.0	6.8		18.8		12.6
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	4.6	8.4	6.0	6.8		18.8		12.6
LOS	A	A	A	A		B		B
Approach Delay		8.3		6.8		18.8		12.6
Approach LOS		A		A		B		B

Intersection Summary

Cycle Length: 70
 Actuated Cycle Length: 70
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.36
 Intersection Signal Delay: 8.0
 Intersection LOS: A
 Intersection Capacity Utilization 55.4%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 5: Washington Av./Washington Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 5: Washington Av./Washington Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕		↖	↕			↕	↗		↕	↗
Traffic Volume (vph)	49	1022	8	2	371	12	6	3	0	3	1	7
Future Volume (vph)	49	1022	8	2	371	12	6	3	0	3	1	7
Ideal Flow (vphp)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2		4.6	6.2			4.6			4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			1.00			0.91	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.99	
Satd. Flow (prot)	1700	3600		1700	3600			1800			1800	
Flt Permitted	0.49	1.00		0.24	1.00			0.79			0.92	
Satd. Flow (perm)	1700	3600		1700	3600			1800			1800	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	53	1099	9	2	399	13	6	3	0	3	1	8
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	7	0
Lane Group Flow (vph)	53	1108	0	2	410	0	0	9	0	0	5	0
Confl. Peds. (#/hr)			1									
Confl. Bikes (#/hr)			1			1						
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)	51.0	48.0		47.0	46.0			5.6			5.6	
Effective Green, g (s)	51.0	48.0		47.0	46.0			5.6			5.6	
Actuated g/C Ratio	0.73	0.69		0.67	0.66			0.08			0.08	
Clearance Time (s)	4.6	6.2		4.6	6.2			4.6			4.6	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	1238	2468		1141	2365			144			144	
v/s Ratio Prot	c0.00	c0.31		0.00	0.11							
v/s Ratio Perm	0.03			0.00				0.01			0.00	
v/c Ratio	0.04	0.45		0.00	0.17			0.06			0.03	
Uniform Delay, d1	2.7	5.0		3.8	4.6			29.8			29.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	0.6		0.0	0.2			0.2			0.1	
Delay (s)	2.7	5.6		3.8	4.8			30.0			29.8	
Level of Service	A	A		A	A			C			C	
Approach Delay (s)		5.5			4.8			30.0			29.8	
Approach LOS		A			A			C			C	




















Intersection Summary		
HCM 2000 Control Delay	5.6	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.40	A
Actuated Cycle Length (s)	70.0	Sum of lost time (s)
Intersection Capacity Utilization	55.4%	15.4
Analysis Period (min)	15	ICU Level of Service
		B

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
 5: Washington Av./Washington Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	1022	8	2	371	12	6	3	0	3	1	7
Future Volume (veh/h)	49	1022	8	2	371	12	6	3	0	3	1	7
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	53	1099	9	2	399	13	6	3	0	3	1	0
Adj No. of Lanes	1	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	796	2591	21	414	2372	77	119	17	49	127	12	0
Arrive On Green	0.05	0.75	0.75	0.00	0.70	0.70	0.03	0.03	0.00	0.03	0.03	0.00
Sat Flow, veh/h	1619	3476	28	1619	3378	110	1037	519	1530	1163	388	0
Grp Volume(v), veh/h	53	541	567	2	202	210	9	0	0	4	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1794	1619	1710	1778	1556	0	1530	1550	0	0
Q Serve(g_s), s	0.6	8.2	8.2	0.0	2.8	2.8	0.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.6	8.2	8.2	0.0	2.8	2.8	0.4	0.0	0.0	0.2	0.0	0.0
Prop In Lane	1.00		0.02	1.00		0.06	0.67		1.00	0.75		0.00
Lane Grp Cap(c), veh/h	796	1275	1337	414	1201	1248	135	0	49	139	0	0
V/C Ratio(X)	0.07	0.42	0.42	0.00	0.17	0.17	0.07	0.00	0.00	0.03	0.00	0.00
Avail Cap(c_a), veh/h	837	1275	1337	525	1201	1248	703	0	612	696	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.87	0.87	0.87	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	2.3	3.3	3.3	3.2	3.5	3.5	33.0	0.0	0.0	32.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.0	1.0	0.0	0.3	0.3	0.2	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	4.1	4.3	0.0	1.4	1.4	0.2	0.0	0.0	0.1	0.0	0.0
LnGrp Delay(d),s/veh	2.3	4.4	4.3	3.2	3.8	3.8	33.2	0.0	0.0	33.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C			C		
Approach Vol, veh/h		1161			414			9				4
Approach Delay, s/veh		4.2			3.8			33.2				33.0
Approach LOS		A			A			C				C
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.8	58.4		6.8	7.8	55.4		6.8				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.0	21.6		28.0	5.0	21.6		28.0				
Max Q Clear Time (g_c+I1), s	2.0	10.2		2.2	2.6	4.8		2.4				
Green Ext Time (p_c), s	0.0	7.9		0.0	0.0	10.6		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			4.4									
HCM 2010 LOS			A									

Intersection												
Int Delay, s/veh	5.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↔	
Traffic Vol, veh/h	0	0	0	0	0	8	0	0	0	12	0	0
Future Vol, veh/h	0	0	0	0	0	8	0	0	0	12	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	70	70	70	70	70	70	70	70	70	70	70
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	11	0	0	0	17	0	0

Major/Minor	Major1			Major2			Minor2				
Conflicting Flow All	11	0	-	-	-	0	-	-	6	6	6
Stage 1	-	-	-	-	-	-	-	-	6	6	-
Stage 2	-	-	-	-	-	-	-	-	0	0	-
Critical Hdwy	4.1	-	-	-	-	-	-	-	6.4	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	5.4	5.5	-
Follow-up Hdwy	2.2	-	-	-	-	-	-	-	3.5	4	3.3
Pot Cap-1 Maneuver	1621	-	0	0	-	-	-	-	1021	893	1083
Stage 1	-	-	0	0	-	-	-	-	1022	895	-
Stage 2	-	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1621	-	-	-	-	-	-	-	1021	0	1083
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	1021	0	-
Stage 1	-	-	-	-	-	-	-	-	1022	0	-
Stage 2	-	-	-	-	-	-	-	-	-	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1621	-	-	-	1021
HCM Lane V/C Ratio	-	-	-	-	0.017
HCM Control Delay (s)	0	-	-	-	8.6
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Timings

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.

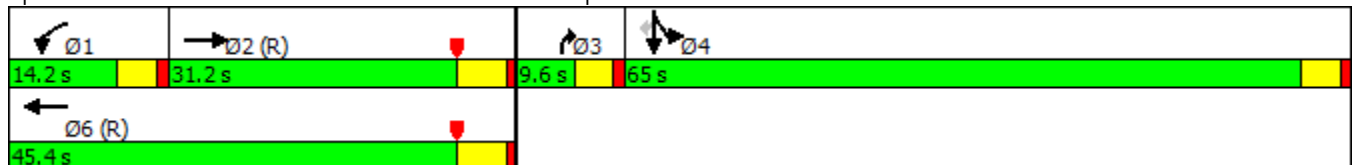


Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↘	↑↑	↗	↘	↗	↗
Traffic Volume (vph)	450	35	411	23	580	304	615
Future Volume (vph)	450	35	411	23	580	304	615
Turn Type	NA	Prot	NA	Prot	Split	NA	Perm
Protected Phases	2	1	6	3	4	4	
Permitted Phases							4
Detector Phase	2	1	6	3	4	4	4
Switch Phase							
Minimum Initial (s)	10.0	5.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	22.4	9.6	15.4	9.5	14.6	14.6	14.6
Total Split (s)	31.2	14.2	45.4	9.6	65.0	65.0	65.0
Total Split (%)	26.0%	11.8%	37.8%	8.0%	54.2%	54.2%	54.2%
Yellow Time (s)	4.4	3.6	4.4	3.5	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	4.6	5.4	4.5	4.6	4.6	4.6
Lead/Lag	Lag	Lead		Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes
Recall Mode	C-Max	None	C-Max	None	Max	Max	Max
Act Effect Green (s)	32.2	7.2	40.0	5.1	64.2	64.2	64.2
Actuated g/C Ratio	0.27	0.06	0.33	0.04	0.54	0.54	0.54
v/c Ratio	0.54	0.38	0.37	0.08	0.52	0.51	0.61
Control Delay	41.0	64.2	31.6	0.5	21.4	21.0	13.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.0	64.2	31.6	0.5	21.4	21.0	13.0
LOS	D	E	C	A	C	C	B
Approach Delay	41.0		34.1			17.8	
Approach LOS	D		C			B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.61
 Intersection Signal Delay: 25.2
 Intersection LOS: C
 Intersection Capacity Utilization 60.5%
 ICU Level of Service B
 Analysis Period (min) 15




















Splits and Phases: 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.



HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑				↗	↖	↑↑	↗
Traffic Volume (vph)	0	450	31	35	411	0	0	0	23	580	304	615
Future Volume (vph)	0	450	31	35	411	0	0	0	23	580	304	615
Ideal Flow (vphpl)	1800	1800	1800	1700	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Lane Util. Factor		0.95		1.00	0.95				1.00	0.95	0.95	1.00
Frbp, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Frt		0.99		1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00				1.00	0.95	0.98	1.00
Satd. Flow (prot)		3600		1700	3600				1800	1700	1800	1800
Flt Permitted		1.00		0.95	1.00				1.00	0.95	0.98	1.00
Satd. Flow (perm)		3600		1700	3600				1800	1700	1800	1800
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	489	34	38	447	0	0	0	25	630	330	668
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	24	0	0	140
Lane Group Flow (vph)	0	519	0	38	447	0	0	0	1	472	488	528
Confl. Peds. (#/hr)			6			1						
Confl. Bikes (#/hr)						2						
Turn Type		NA		Prot	NA				Prot	Split	NA	Perm
Protected Phases		2		1	6				3	4	4	
Permitted Phases												4
Actuated Green, G (s)		28.6		5.0	38.2				3.1	64.2	64.2	64.2
Effective Green, g (s)		28.6		5.0	38.2				3.1	64.2	64.2	64.2
Actuated g/C Ratio		0.24		0.04	0.32				0.03	0.54	0.54	0.54
Clearance Time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Vehicle Extension (s)		3.0		2.0	3.0				3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		858		70	1146				46	909	963	963
v/s Ratio Prot		c0.14		0.02	c0.12				c0.00	0.28	0.27	
v/s Ratio Perm												c0.29
v/c Ratio		0.61		0.54	0.39				0.01	0.52	0.51	0.55
Uniform Delay, d1		40.7		56.4	31.8				57.0	18.0	17.8	18.4
Progression Factor		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		3.2		4.5	1.0				0.1	2.1	1.9	2.2
Delay (s)		43.8		60.9	32.8				57.1	20.1	19.7	20.6
Level of Service		D		E	C				E	C	B	C
Approach Delay (s)		43.8			35.0			57.1			20.2	
Approach LOS		D			D			E			C	
Intersection Summary												
HCM 2000 Control Delay			27.9			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			19.1			
Intersection Capacity Utilization			60.5%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	450	31	35	411	0	0	0	23	580	304	615
Future Volume (veh/h)	0	450	31	35	411	0	0	0	23	580	304	615
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	0	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	489	23	38	447	0	0	0	12	480	540	666
Adj No. of Lanes	0	2	0	1	2	0	0	0	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1147	54	48	1414	0	0	0	0	815	906	770
Arrive On Green	0.00	0.35	0.35	0.03	0.41	0.00	0.00	0.00	0.00	0.50	0.50	0.50
Sat Flow, veh/h	0	3415	156	1619	3510	0		0		1619	1800	1530
Grp Volume(v), veh/h	0	251	261	38	447	0		0.0		480	540	666
Grp Sat Flow(s),veh/h/ln	0	1710	1771	1619	1710	0				1619	1800	1530
Q Serve(g_s), s	0.0	13.5	13.6	2.8	10.6	0.0				25.1	25.5	45.9
Cycle Q Clear(g_c), s	0.0	13.5	13.6	2.8	10.6	0.0				25.1	25.5	45.9
Prop In Lane	0.00		0.09	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	590	611	48	1414	0				815	906	770
V/C Ratio(X)	0.00	0.43	0.43	0.78	0.32	0.00				0.59	0.60	0.86
Avail Cap(c_a), veh/h	0	590	611	130	1414	0				815	906	770
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.78	0.78	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	30.2	30.2	57.8	23.8	0.0				21.0	21.1	26.2
Incr Delay (d2), s/veh	0.0	2.2	2.2	7.8	0.5	0.0				3.1	2.9	12.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	6.7	7.0	1.4	5.1	0.0				11.9	13.3	21.9
LnGrp Delay(d),s/veh	0.0	32.4	32.4	65.6	24.2	0.0				24.2	24.0	38.6
LnGrp LOS		C	C	E	C					C	C	D
Approach Vol, veh/h		512			485						1686	
Approach Delay, s/veh		32.4			27.5						29.8	
Approach LOS		C			C						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	8.2	46.8		65.0		55.0						
Change Period (Y+Rc), s	4.6	5.4		4.6		5.4						
Max Green Setting (Gmax), s	9.6	25.8		60.4		40.0						
Max Q Clear Time (g_c+I1), s	4.8	15.6		47.9		12.6						
Green Ext Time (p_c), s	0.0	4.1		6.1		6.2						
Intersection Summary												
HCM 2010 Ctrl Delay			29.9									
HCM 2010 LOS			C									
Notes												

Timings

9: Waterman Av. & Orange Show Rd./Orange Show Rd.

3/27/2017

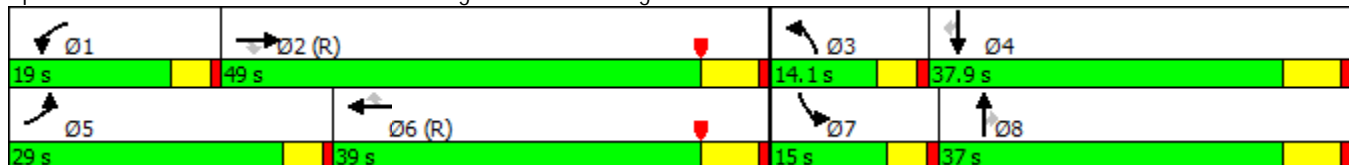


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑	↗	↘	↑↑	↗	↘	↑↑	↗
Traffic Volume (vph)	169	518	325	95	274	84	55	469	62	72	565	64
Future Volume (vph)	169	518	325	95	274	84	55	469	62	72	565	64
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.2	35.2	9.6	35.2	35.2	9.6	33.2	33.2	9.6	33.2	33.2
Total Split (s)	29.0	49.0	49.0	19.0	39.0	39.0	14.1	37.0	37.0	15.0	37.9	37.9
Total Split (%)	24.2%	40.8%	40.8%	15.8%	32.5%	32.5%	11.8%	30.8%	30.8%	12.5%	31.6%	31.6%
Yellow Time (s)	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Act Effct Green (s)	18.1	45.7	45.7	11.5	39.1	39.1	8.0	34.2	34.2	9.1	35.1	35.1
Actuated g/C Ratio	0.15	0.38	0.38	0.10	0.33	0.33	0.07	0.28	0.28	0.08	0.29	0.29
v/c Ratio	0.77	0.44	0.43	0.67	0.54	0.14	0.57	0.53	0.12	0.66	0.62	0.12
Control Delay	68.1	29.4	8.1	72.0	38.6	1.3	72.9	39.5	0.4	77.0	40.9	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.1	29.4	8.1	72.0	38.6	1.3	72.9	39.5	0.4	77.0	40.9	0.4
LOS	E	C	A	E	D	A	E	D	A	E	D	A
Approach Delay		29.1			38.6			38.5			40.9	
Approach LOS		C			D			D			D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 35.7
 Intersection LOS: D
 Intersection Capacity Utilization 64.3%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	169	518	325	95	274	84	55	469	62	72	565	64
Future Volume (vph)	169	518	325	95	274	84	55	469	62	72	565	64
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	197	602	378	110	319	98	64	545	72	84	657	74
RTOR Reduction (vph)	0	0	187	0	0	67	0	0	51	0	0	52
Lane Group Flow (vph)	197	602	191	110	319	31	64	545	21	84	657	22
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	NA	4
Permitted Phases			2			6			8			4
Actuated Green, G (s)	18.1	44.8	44.8	11.5	38.2	38.2	7.0	34.2	34.2	7.9	35.1	35.1
Effective Green, g (s)	18.1	44.8	44.8	11.5	38.2	38.2	7.0	34.2	34.2	7.9	35.1	35.1
Actuated g/C Ratio	0.15	0.37	0.37	0.10	0.32	0.32	0.06	0.29	0.29	0.07	0.29	0.29
Clearance Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	256	1344	672	162	573	573	99	1026	513	111	1053	526
v/s Ratio Prot	c0.12	0.17		0.06	c0.18		0.04	0.15		c0.05	c0.18	
v/s Ratio Perm			0.11			0.02			0.01			0.01
v/c Ratio	0.77	0.45	0.28	0.68	0.56	0.05	0.65	0.53	0.04	0.76	0.62	0.04
Uniform Delay, d1	48.9	28.3	26.4	52.5	33.9	28.4	55.3	36.1	31.0	55.1	36.7	30.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.8	1.1	1.1	8.6	3.9	0.2	10.4	2.0	0.1	22.6	2.8	0.1
Delay (s)	60.8	29.4	27.4	61.0	37.8	28.6	65.7	38.1	31.2	77.7	39.5	30.5
Level of Service	E	C	C	E	D	C	E	D	C	E	D	C
Approach Delay (s)		34.0			40.9			40.0			42.6	
Approach LOS		C			D			D			D	

Intersection Summary

























HCM 2000 Control Delay	38.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	169	518	325	95	274	84	55	469	62	72	565	64
Future Volume (veh/h)	169	518	325	95	274	84	55	469	62	72	565	64
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	197	602	279	110	319	57	64	545	36	84	657	51
Adj No. of Lanes	1	2	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	222	1428	639	132	652	554	80	878	393	103	928	415
Arrive On Green	0.14	0.42	0.42	0.08	0.36	0.36	0.05	0.26	0.26	0.06	0.27	0.27
Sat Flow, veh/h	1619	3420	1530	1619	1800	1530	1619	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	197	602	279	110	319	57	64	545	36	84	657	51
Grp Sat Flow(s),veh/h/ln	1619	1710	1530	1619	1800	1530	1619	1710	1530	1619	1710	1530
Q Serve(g_s), s	14.3	14.9	15.6	8.0	16.5	3.0	4.7	16.9	2.1	6.1	20.8	3.0
Cycle Q Clear(g_c), s	14.3	14.9	15.6	8.0	16.5	3.0	4.7	16.9	2.1	6.1	20.8	3.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	222	1428	639	132	652	554	80	878	393	103	928	415
V/C Ratio(X)	0.89	0.42	0.44	0.83	0.49	0.10	0.80	0.62	0.09	0.81	0.71	0.12
Avail Cap(c_a), veh/h	329	1428	639	194	652	554	128	878	393	140	928	415
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.94	0.94	0.94	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.8	24.7	24.9	54.3	29.7	25.4	56.5	39.4	34.0	55.5	39.4	33.0
Incr Delay (d2), s/veh	12.5	0.9	2.0	11.7	2.6	0.4	6.8	3.3	0.5	16.5	4.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.2	7.2	6.9	4.0	8.6	1.3	2.2	8.3	1.0	3.2	10.4	1.3
LnGrp Delay(d),s/veh	63.4	25.6	26.9	65.9	32.3	25.7	63.3	42.7	34.4	71.9	44.0	33.6
LnGrp LOS	E	C	C	E	C	C	E	D	C	E	D	C
Approach Vol, veh/h		1078			486			645			792	
Approach Delay, s/veh		32.8			39.1			44.3			46.3	
Approach LOS		C			D			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.4	56.3	10.5	38.8	21.1	49.7	12.3	37.0				
Change Period (Y+Rc), s	4.6	6.2	4.6	6.2	4.6	6.2	4.6	6.2				
Max Green Setting (Gmax), s	14.4	42.8	9.5	31.7	24.4	32.8	10.4	30.8				
Max Q Clear Time (g_c+I1), s	10.0	17.6	6.7	22.8	16.3	18.5	8.1	18.9				
Green Ext Time (p_c), s	0.0	10.3	0.0	4.7	0.2	7.6	0.0	5.7				
Intersection Summary												
HCM 2010 Ctrl Delay			39.9									
HCM 2010 LOS			D									

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↕	↕
Traffic Vol, veh/h	3	10	1	582	1022	8
Future Vol, veh/h	3	10	1	582	1022	8
Conflicting Peds, #/hr	0	0	0	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	75	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	4	13	1	728	1278	10

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1651	646	1290 0
Stage 1	1285	-	- -
Stage 2	366	-	- -
Critical Hdwy	6.8	6.9	4.1 -
Critical Hdwy Stg 1	5.8	-	- -
Critical Hdwy Stg 2	5.8	-	- -
Follow-up Hdwy	3.5	3.3	2.2 -
Pot Cap-1 Maneuver	*91	*671	835 -
Stage 1	*495	-	- -
Stage 2	*839	-	- -
Platoon blocked, %		1	1 -
Mov Cap-1 Maneuver	*91	*670	835 -
Mov Cap-2 Maneuver	*322	-	- -
Stage 1	*495	-	- -
Stage 2	*837	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	11.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	835	-	322	670	-	-
HCM Lane V/C Ratio	0.001	-	0.012	0.019	-	-
HCM Control Delay (s)	9.3	-	16.3	10.5	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0	0.1	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Timings
 11: Waterman Av. & Driveway 2/Park Center Dr.



Lane Group	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	Ø4
Lane Configurations		↖	↗	↖	↕	↗	↖	↕	
Traffic Volume (vph)	19	1	7	20	632	118	44	778	
Future Volume (vph)	19	1	7	20	632	118	44	778	
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		8		5	2		1	6	4
Permitted Phases	8		8	2		2	6		
Detector Phase	8	8	8	5	2	2	1	6	
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	21.6	21.6	21.6	9.6	23.2	23.2	9.6	33.2	14.6
Total Split (s)	21.6	21.6	21.6	9.6	32.0	32.0	11.4	33.8	21.6
Total Split (%)	33.2%	33.2%	33.2%	14.8%	49.2%	49.2%	17.5%	52.0%	33%
Yellow Time (s)	3.6	3.6	3.6	3.6	5.2	5.2	3.6	5.2	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Lead/Lag				Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max	None
Act Effect Green (s)		11.4	11.4	50.0	47.9	47.9	54.5	51.4	
Actuated g/C Ratio		0.18	0.18	0.77	0.74	0.74	0.84	0.79	
v/c Ratio		0.08	0.02	0.05	0.29	0.11	0.04	0.34	
Control Delay		21.6	0.1	4.1	7.4	2.6	3.5	6.9	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		21.6	0.1	4.1	7.4	2.6	3.5	6.9	
LOS		C	A	A	A	A	A	A	
Approach Delay		15.7			6.6			6.7	
Approach LOS		B			A			A	

Intersection Summary

Cycle Length: 65
 Actuated Cycle Length: 65
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.34
 Intersection Signal Delay: 6.8
 Intersection Capacity Utilization 48.2%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 11: Waterman Av. & Driveway 2/Park Center Dr.



HCM Signalized Intersection Capacity Analysis
 11: Waterman Av. & Driveway 2/Park Center Dr.





















Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↕	↕	↕	↕↕	
Traffic Volume (vph)	0	0	0	19	1	7	20	632	118	44	778	5
Future Volume (vph)	0	0	0	19	1	7	20	632	118	44	778	5
Ideal Flow (vphp)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)					4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor					1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes					1.00	1.00	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes					1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt					1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected					0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)					1800	1800	1615	3600	1800	1700	3600	
Flt Permitted					0.73	1.00	0.29	1.00	1.00	0.34	1.00	
Satd. Flow (perm)					1800	1800	487	3600	1800	1700	3600	
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	0	0	0	23	1	9	25	780	146	54	960	6
RTOR Reduction (vph)	0	0	0	0	0	8	0	0	54	0	0	0
Lane Group Flow (vph)	0	0	0	0	24	1	25	780	92	54	966	0
Confl. Bikes (#/hr)									2			2
Turn Type				Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1		6
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)					5.4	5.4	42.8	40.8	40.8	45.6	42.2	
Effective Green, g (s)					5.4	5.4	42.8	40.8	40.8	45.6	42.2	
Actuated g/C Ratio					0.08	0.08	0.66	0.63	0.63	0.70	0.65	
Clearance Time (s)					4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Vehicle Extension (s)					3.0	3.0	2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)					149	149	355	2259	1129	1192	2337	
v/s Ratio Prot							0.00	0.22		c0.00	c0.27	
v/s Ratio Perm					0.01	0.00	0.04		0.05	0.03		
v/c Ratio					0.16	0.01	0.07	0.35	0.08	0.05	0.41	
Uniform Delay, d1					27.7	27.3	3.9	5.8	4.7	3.0	5.5	
Progression Factor					1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2					0.5	0.0	0.0	0.4	0.1	0.0	0.5	
Delay (s)					28.2	27.3	3.9	6.2	4.9	3.0	6.0	
Level of Service					C	C	A	A	A	A	A	
Approach Delay (s)		0.0			28.0			5.9			5.8	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	15.4
Intersection Capacity Utilization	48.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	19	1	7	20	632	118	44	778	5
Future Volume (veh/h)	0	0	0	19	1	7	20	632	118	44	778	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	0	0	23	1	7	25	780	142	54	960	6
Adj No. of Lanes	0	1	0	0	1	1	1	2	1	1	2	0
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	119	0	198	6	101	459	2220	972	506	2331	15
Arrive On Green	0.00	0.00	0.00	0.07	0.07	0.07	0.03	0.65	0.65	0.05	0.67	0.67
Sat Flow, veh/h	0	1800	0	1363	96	1530	1619	3420	1498	1619	3484	22
Grp Volume(v), veh/h	0	0	0	24	0	7	25	780	142	54	471	495
Grp Sat Flow(s),veh/h/ln	0	1800	0	1459	0	1530	1619	1710	1498	1619	1710	1796
Q Serve(g_s), s	0.0	0.0	0.0	0.9	0.0	0.3	0.3	6.7	2.4	0.7	8.2	8.2
Cycle Q Clear(g_c), s	0.0	0.0	0.0	1.0	0.0	0.3	0.3	6.7	2.4	0.7	8.2	8.2
Prop In Lane	0.00		0.00	0.96		1.00	1.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	0	119	0	205	0	101	459	2220	972	506	1144	1202
V/C Ratio(X)	0.00	0.00	0.00	0.12	0.00	0.07	0.05	0.35	0.15	0.11	0.41	0.41
Avail Cap(c_a), veh/h	0	471	0	489	0	400	539	2220	972	597	1144	1202
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	28.8	0.0	28.5	3.8	5.2	4.4	3.5	4.9	4.9
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.3	0.0	0.3	0.0	0.4	0.3	0.0	1.1	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.4	0.0	0.1	0.1	3.3	1.1	0.3	4.1	4.3
LnGrp Delay(d),s/veh	0.0	0.0	0.0	29.1	0.0	28.8	3.8	5.6	4.7	3.5	6.0	6.0
LnGrp LOS				C		C	A	A	A	A	A	A
Approach Vol, veh/h		0			31			947			1020	
Approach Delay, s/veh		0.0			29.0			5.4			5.8	
Approach LOS					C			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.7	48.4		8.9	6.4	49.7		8.9				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	6.8	25.8		17.0	5.0	27.6		17.0				
Max Q Clear Time (g_c+I1), s	2.7	8.7		0.0	2.3	10.2		3.0				
Green Ext Time (p_c), s	0.0	12.6		0.0	0.0	12.8		0.1				
Intersection Summary												
HCM 2010 Ctrl Delay			6.0									
HCM 2010 LOS			A									

Timings
12: Waterman Av./Waterman Av. & Hospitality Ln.

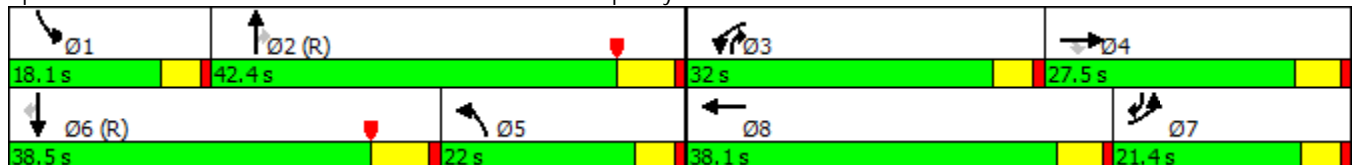


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	158	183	129	359	399	284	802	802	90	436	142
Future Volume (vph)	158	183	129	359	399	284	802	802	90	436	142
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8	5	2	3	1	6	7
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	3	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	15.1	15.1	9.6	38.1	9.6	36.2	9.6	9.6	36.2	9.6
Total Split (s)	21.4	27.5	27.5	32.0	38.1	22.0	42.4	32.0	18.1	38.5	21.4
Total Split (%)	17.8%	22.9%	22.9%	26.7%	31.8%	18.3%	35.3%	26.7%	15.1%	32.1%	17.8%
Yellow Time (s)	3.6	4.1	4.1	3.6	4.1	3.6	5.2	3.6	3.6	5.2	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	5.1	4.6	5.1	4.6	6.2	4.6	4.6	6.2	4.6
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	15.4	18.7	18.7	19.7	23.0	17.4	50.4	76.3	10.7	43.7	65.3
Actuated g/C Ratio	0.13	0.16	0.16	0.16	0.19	0.14	0.42	0.64	0.09	0.36	0.54
v/c Ratio	0.78	0.41	0.24	0.74	0.71	0.66	0.57	0.35	0.64	0.24	0.15
Control Delay	74.1	43.9	1.6	56.1	49.3	56.0	30.7	4.2	71.6	28.6	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.1	43.9	1.6	56.1	49.3	56.0	30.7	4.2	71.6	28.6	5.2
LOS	E	D	A	E	D	E	C	A	E	C	A
Approach Delay		45.6			52.3		23.3			29.4	
Approach LOS		D			D		C			C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 105
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 33.3
 Intersection LOS: C
 Intersection Capacity Utilization 79.0%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 12: Waterman Av./Waterman Av. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
 12: Waterman Av./Waterman Av. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)

3/27/2017


























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	158	183	129	359	399	67	284	802	802	90	436	142
Future Volume (vph)	158	183	129	359	399	67	284	802	802	90	436	142
Ideal Flow (vphpl)	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Lane Util. Factor	1.00	0.91	0.91	0.97	0.95		0.97	0.95	0.88	1.00	0.91	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	170	197	139	386	429	72	305	862	862	97	469	153
RTOR Reduction (vph)	0	13	85	0	13	0	0	0	228	0	0	59
Lane Group Flow (vph)	170	222	16	386	488	0	305	862	634	97	469	94
Confl. Peds. (#/hr)						9			1			3
Confl. Bikes (#/hr)						2			3			
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4						2			6
Actuated Green, G (s)	15.4	18.7	18.7	19.7	23.0		17.4	50.4	70.1	10.7	43.7	59.1
Effective Green, g (s)	15.4	18.7	18.7	19.7	23.0		17.4	50.4	70.1	10.7	43.7	59.1
Actuated g/C Ratio	0.13	0.16	0.16	0.16	0.19		0.14	0.42	0.58	0.09	0.36	0.49
Clearance Time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	4.0	2.0	2.0	4.0	2.0
Lane Grp Cap (vph)	218	561	280	525	690		464	1512	2103	151	1966	955
v/s Ratio Prot	c0.10	c0.06		0.12	c0.14		c0.10	c0.24	0.05	c0.06	0.09	0.01
v/s Ratio Perm			0.01						0.13			0.04
v/c Ratio	0.78	0.40	0.06	0.74	0.71		0.66	0.57	0.30	0.64	0.24	0.10
Uniform Delay, d1	50.7	45.6	43.1	47.7	45.4		48.5	26.5	12.6	52.8	26.6	16.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.8	0.5	0.1	4.6	3.3		2.6	1.6	0.0	6.8	0.3	0.0
Delay (s)	65.4	46.0	43.2	52.3	48.7		51.0	28.1	12.6	59.6	26.9	16.3
Level of Service	E	D	D	D	D		D	C	B	E	C	B
Approach Delay (s)		52.0			50.2			25.0			29.0	
Approach LOS		D			D			C			C	

Intersection Summary

HCM 2000 Control Delay	34.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	158	183	129	359	399	67	284	802	802	90	436	142
Future Volume (veh/h)	158	183	129	359	399	67	284	802	802	90	436	142
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	170	197	65	386	429	57	305	862	430	97	469	55
Adj No. of Lanes	1	2	1	2	2	0	2	2	2	1	3	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	199	592	252	441	565	75	689	1513	1565	118	1323	598
Arrive On Green	0.12	0.16	0.16	0.15	0.19	0.19	0.23	0.44	0.44	0.07	0.27	0.27
Sat Flow, veh/h	1619	3600	1530	2956	3026	399	2956	3420	2629	1619	4914	1525
Grp Volume(v), veh/h	170	197	65	386	241	245	305	862	430	97	469	55
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	1710	1716	1478	1710	1315	1619	1638	1525
Q Serve(g_s), s	12.4	5.8	2.7	15.3	16.0	16.2	10.6	22.5	9.6	7.1	9.3	0.0
Cycle Q Clear(g_c), s	12.4	5.8	2.7	15.3	16.0	16.2	10.6	22.5	9.6	7.1	9.3	0.0
Prop In Lane	1.00		1.00	1.00		0.23	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	199	592	252	441	319	321	689	1513	1565	118	1323	598
V/C Ratio(X)	0.86	0.33	0.26	0.88	0.75	0.76	0.44	0.57	0.27	0.82	0.35	0.09
Avail Cap(c_a), veh/h	227	672	286	675	470	472	689	1513	1565	182	1323	598
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.79	0.79	0.79	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.6	44.3	16.2	50.0	46.2	46.3	39.4	24.9	12.0	54.8	35.4	23.0
Incr Delay (d2), s/veh	21.8	0.3	0.5	4.4	3.1	3.4	0.2	1.6	0.4	8.8	0.7	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.7	2.9	1.2	6.5	7.8	8.0	4.3	11.0	3.6	3.5	4.3	1.2
LnGrp Delay(d),s/veh	73.3	44.6	16.7	54.4	49.3	49.7	39.5	26.5	12.4	63.6	36.2	23.3
LnGrp LOS	E	D	B	D	D	D	D	C	B	E	D	C
Approach Vol, veh/h		432			872			1597			621	
Approach Delay, s/veh		51.7			51.7			25.2			39.3	
Approach LOS		D			D			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.4	59.3	22.5	24.8	34.2	38.5	19.8	27.5				
Change Period (Y+Rc), s	4.6	6.2	4.6	5.1	6.2	* 6.2	5.1	* 5.1				
Max Green Setting (Gmax), s	13.5	36.2	27.4	22.4	17.4	* 32	16.8	* 33				
Max Q Clear Time (g_c+I1), s	9.1	24.5	17.3	7.8	12.6	11.3	14.4	18.2				
Green Ext Time (p_c), s	0.0	7.4	0.6	1.3	0.7	4.1	0.4	2.4				
Intersection Summary												
HCM 2010 Ctrl Delay				37.5								
HCM 2010 LOS				D								
Notes												

Intersection

Int Delay, s/veh 1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↖	↗	↗	↖
Traffic Vol, veh/h	0	0	281	1887	772	154
Future Vol, veh/h	0	0	281	1887	772	154
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	0	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	293	1966	804	160

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	402	804
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	7.1	5.3
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.9	3.1
Pot Cap-1 Maneuver	0	*745	*937
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	1	1
Mov Cap-1 Maneuver	-	*745	*937
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	1.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	* 937	-	-	-	-
HCM Lane V/C Ratio	0.312	-	-	-	-
HCM Control Delay (s)	10.6	-	0	-	-
HCM Lane LOS	B	-	A	-	-
HCM 95th %tile Q(veh)	1.3	-	-	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection

Int Delay, s/veh 0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations						↗		↑↑			↑↑	
Traffic Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Future Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	-	-	-	Free	-	-	-	-	-	None
Storage Length	-	-	-	-	-	0	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	1209	0	998	0	0	746	171

Major/Minor

	Minor1	Major1	Major2
Conflicting Flow All	-	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	0	0	0
Stage 1	0	0	0
Stage 2	0	0	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach

	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt

	NBTWBLn1	SBT	SBR
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	-	0	-
HCM Lane LOS	-	A	-
HCM 95th %tile Q(veh)	-	-	-

Intersection

Int Delay, s/veh

Movement	NWL	NWR
Lane Configurations		
Traffic Vol, veh/h	0	0
Future Vol, veh/h	0	0
Conflicting Peds, #/hr	0	0
Sign Control	Stop	Stop
RT Channelized	-	-
Storage Length	-	-
Veh in Median Storage, #	0	-
Grade, %	0	-
Peak Hour Factor	95	95
Heavy Vehicles, %	0	0
Mvmt Flow	0	0

Major/Minor

Conflicting Flow All		
Stage 1		
Stage 2		
Critical Hdwy		
Critical Hdwy Stg 1		
Critical Hdwy Stg 2		
Follow-up Hdwy		
Pot Cap-1 Maneuver		
Stage 1		
Stage 2		
Platoon blocked, %		
Mov Cap-1 Maneuver		
Mov Cap-2 Maneuver		
Stage 1		
Stage 2		

Approach

HCM Control Delay, s
 HCM LOS

Minor Lane/Major Mvmt

Timings

15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.

3/27/2017

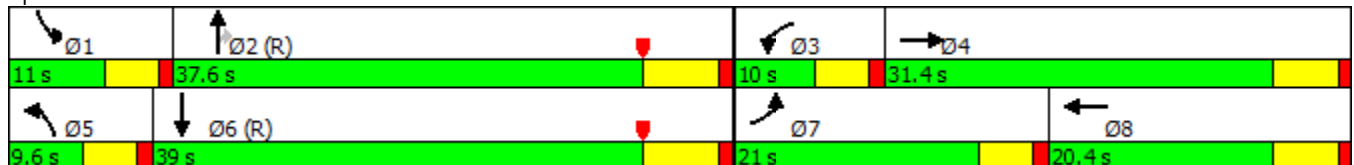


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖↖	↗↗	↖	↗	↖	↗↗	↗	↖	↗↗
Traffic Volume (vph)	471	367	108	221	39	760	110	73	396
Future Volume (vph)	471	367	108	221	39	760	110	73	396
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	9.6	31.4	9.6	15.4	9.6	36.2	36.2	9.6	36.2
Total Split (s)	21.0	31.4	10.0	20.4	9.6	37.6	37.6	11.0	39.0
Total Split (%)	23.3%	34.9%	11.1%	22.7%	10.7%	41.8%	41.8%	12.2%	43.3%
Yellow Time (s)	3.6	4.4	3.6	4.4	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	5.4	4.6	6.2	6.2	4.6	6.2
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)	15.9	22.7	5.4	12.2	5.7	36.0	36.0	7.1	39.4
Actuated g/C Ratio	0.18	0.25	0.06	0.14	0.06	0.40	0.40	0.08	0.44
v/c Ratio	0.87	0.61	1.11	0.61	0.38	0.55	0.14	0.57	0.37
Control Delay	53.5	24.2	163.5	33.2	51.0	24.0	0.5	58.2	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.5	24.2	163.5	33.2	51.0	24.0	0.5	58.2	16.4
LOS	D	C	F	C	D	C	A	E	B
Approach Delay		37.1		65.9		22.3			21.1
Approach LOS		D		E		C			C

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.11
 Intersection Signal Delay: 33.4
 Intersection LOS: C
 Intersection Capacity Utilization 72.8%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.

























HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔	↕↔		↔	↕↕	↔	↔	↕↔	
Traffic Volume (vph)	471	367	233	108	221	104	39	760	110	73	396	179
Future Volume (vph)	471	367	233	108	221	104	39	760	110	73	396	179
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.94		1.00	0.95		1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Flt Permitted	1.00	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	491	382	243	112	230	108	41	792	115	76	412	186
RTOR Reduction (vph)	0	119	0	0	64	0	0	0	70	0	53	0
Lane Group Flow (vph)	491	506	0	113	274	0	41	792	45	76	546	0
Confl. Peds. (#/hr)			3						1			4
Confl. Bikes (#/hr)			1						1			
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	15.9	22.7		5.4	12.2		3.6	35.1	35.1	6.0	37.5	
Effective Green, g (s)	15.9	22.7		5.4	12.2		3.6	35.1	35.1	6.0	37.5	
Actuated g/C Ratio	0.18	0.25		0.06	0.14		0.04	0.39	0.39	0.07	0.42	
Clearance Time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	565	908		102	488		68	1404	702	113	1500	
v/s Ratio Prot	c0.15	c0.14		0.07	0.08		0.02	c0.22		c0.04	0.15	
v/s Ratio Perm									0.02			
v/c Ratio	0.87	0.56		1.11	0.56		0.60	0.56	0.06	0.67	0.36	
Uniform Delay, d1	36.0	29.3		42.3	36.4		42.5	21.5	17.2	41.0	18.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	13.0	0.7		121.1	1.5		9.9	1.6	0.2	11.7	0.7	
Delay (s)	49.0	30.0		163.4	37.9		52.4	23.1	17.3	52.7	18.7	
Level of Service	D	C		F	D		D	C	B	D	B	
Approach Delay (s)		38.4			69.3			23.7			22.6	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	35.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	20.8
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	471	367	233	108	221	104	39	760	110	73	396	179
Future Volume (veh/h)	471	367	233	108	221	104	39	760	110	73	396	179
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	491	382	189	112	230	83	41	792	73	76	412	131
Adj No. of Lanes	2	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	539	575	280	97	341	120	58	1338	590	94	1059	333
Arrive On Green	0.18	0.26	0.26	0.06	0.14	0.14	0.04	0.39	0.39	0.06	0.41	0.41
Sat Flow, veh/h	2956	2218	1080	1619	2484	872	1619	3420	1510	1619	2560	805
Grp Volume(v), veh/h	491	293	278	112	156	157	41	792	73	76	274	269
Grp Sat Flow(s),veh/h/ln	1478	1710	1588	1619	1710	1646	1619	1710	1510	1619	1710	1655
Q Serve(g_s), s	14.7	13.8	14.1	5.4	7.8	8.2	2.3	16.5	2.8	4.2	10.1	10.2
Cycle Q Clear(g_c), s	14.7	13.8	14.1	5.4	7.8	8.2	2.3	16.5	2.8	4.2	10.1	10.2
Prop In Lane	1.00		0.68	1.00		0.53	1.00		1.00	1.00		0.49
Lane Grp Cap(c), veh/h	539	444	412	97	235	226	58	1338	590	94	708	685
V/C Ratio(X)	0.91	0.66	0.67	1.15	0.67	0.69	0.71	0.59	0.12	0.80	0.39	0.39
Avail Cap(c_a), veh/h	539	494	459	97	285	274	90	1338	590	115	708	685
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.84	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.1	29.8	29.9	42.3	36.9	37.0	42.9	21.7	17.5	41.9	18.4	18.5
Incr Delay (d2), s/veh	17.0	2.4	2.9	138.3	4.3	5.7	5.9	1.9	0.4	23.2	1.6	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	6.8	6.5	6.1	4.0	4.1	1.1	8.2	1.2	2.5	5.0	5.0
LnGrp Delay(d),s/veh	53.1	32.2	32.8	180.6	41.2	42.7	48.8	23.6	18.0	65.1	20.0	20.2
LnGrp LOS	D	C	C	F	D	D	D	C	B	E	C	C
Approach Vol, veh/h		1062			425			906			619	
Approach Delay, s/veh		42.0			78.5			24.3			25.6	
Approach LOS		D			E			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.9	41.4	10.0	28.8	7.8	43.4	21.0	17.8				
Change Period (Y+Rc), s	4.6	6.2	4.6	5.4	4.6	6.2	4.6	5.4				
Max Green Setting (Gmax), s	6.4	31.4	5.4	26.0	5.0	32.8	16.4	15.0				
Max Q Clear Time (g_c+I1), s	6.2	18.5	7.4	16.1	4.3	12.2	16.7	10.2				
Green Ext Time (p_c), s	0.0	8.2	0.0	3.6	0.0	11.3	0.0	2.2				
Intersection Summary												
HCM 2010 Ctrl Delay			38.5									
HCM 2010 LOS			D									

Timings
 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

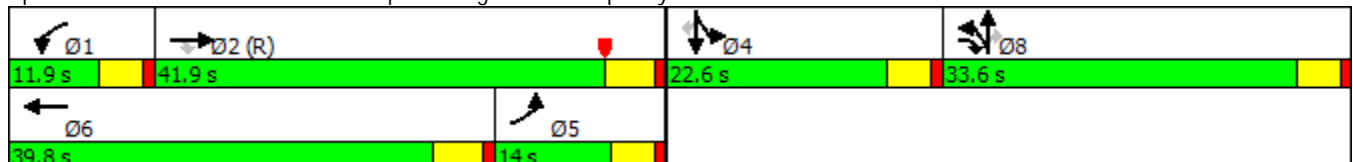


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘↗	↑↑	↘	↔	↗	↘	↑↑	↗
Traffic Volume (vph)	80	175	54	42	101	328	620	182	8	366	80
Future Volume (vph)	80	175	54	42	101	328	620	182	8	366	80
Turn Type	Prot	NA	pm+ov	Prot	NA	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	8	8		4	4	
Permitted Phases			2					8			4
Detector Phase	5	2	8	1	6	8	8	8	4	4	4
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	39.1	33.6	9.6	39.1	33.6	33.6	33.6	22.6	22.6	22.6
Total Split (s)	14.0	41.9	33.6	11.9	39.8	33.6	33.6	33.6	22.6	22.6	22.6
Total Split (%)	12.7%	38.1%	30.5%	10.8%	36.2%	30.5%	30.5%	30.5%	20.5%	20.5%	20.5%
Yellow Time (s)	3.6	4.1	3.6	3.6	4.1	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lag	Lag		Lead	Lead						
Lead-Lag Optimize?	Yes	Yes		Yes	Yes						
Recall Mode	None	C-Max	Max	None	None	Max	Max	Max	Max	Max	Max
Act Effect Green (s)	19.8	42.0	73.3	6.0	26.3	29.0	29.0	29.0	18.0	18.0	18.0
Actuated g/C Ratio	0.18	0.38	0.67	0.05	0.24	0.26	0.26	0.26	0.16	0.16	0.16
v/c Ratio	0.27	0.13	0.05	0.25	0.59	0.67	0.70	0.31	0.03	0.63	0.19
Control Delay	41.8	23.8	1.1	53.0	16.8	44.8	41.3	8.1	39.1	48.4	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.8	23.8	1.1	53.0	16.8	44.8	41.3	8.1	39.1	48.4	1.0
LOS	D	C	A	D	B	D	D	A	D	D	A
Approach Delay		24.6			18.9		36.9			39.8	
Approach LOS		C			B		D			D	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:EBT, Start of Yellow
 Natural Cycle: 105
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 31.0
 Intersection LOS: C
 Intersection Capacity Utilization 77.7%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)

4/6/2017


























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	175	54	42	101	580	328	620	182	8	366	80
Future Volume (vph)	80	175	54	42	101	580	328	620	182	8	366	80
Ideal Flow (vphpl)	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	4.6	4.6	5.1		4.6	4.6	4.6	4.6	4.6	4.6
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.91	0.91	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600		1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600		1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	82	179	55	43	103	592	335	633	186	8	373	82
RTOR Reduction (vph)	0	0	20	0	330	0	0	0	123	0	0	69
Lane Group Flow (vph)	82	179	35	43	365	0	301	667	63	8	373	13
Confl. Peds. (#/hr)			2			1						
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA	pm+ov	Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6		8	8		4	4	
Permitted Phases			2						8			4
Actuated Green, G (s)	19.7	40.1	69.1	4.0	24.4		29.0	29.0	29.0	18.0	18.0	18.0
Effective Green, g (s)	19.7	40.1	69.1	4.0	24.4		29.0	29.0	29.0	18.0	18.0	18.0
Actuated g/C Ratio	0.18	0.36	0.63	0.04	0.22		0.26	0.26	0.26	0.16	0.16	0.16
Clearance Time (s)	4.6	5.1	4.6	4.6	5.1		4.6	4.6	4.6	4.6	4.6	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	304	1312	1130	116	798		448	949	474	278	589	294
v/s Ratio Prot	c0.05	0.05	0.01	0.01	c0.10		0.18	c0.19		0.00	c0.10	
v/s Ratio Perm			0.01						0.04			0.01
v/c Ratio	0.27	0.14	0.03	0.37	0.46		0.67	0.70	0.13	0.03	0.63	0.05
Uniform Delay, d1	38.9	23.4	7.8	51.8	37.1		36.2	36.6	30.9	38.7	42.9	38.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.2	0.1	0.7	0.4		7.8	4.3	0.6	0.2	5.1	0.3
Delay (s)	39.1	23.6	7.8	52.5	37.5		44.1	41.0	31.5	38.8	48.0	39.1
Level of Service	D	C	A	D	D		D	D	C	D	D	D
Approach Delay (s)		24.9			38.4			40.2			46.3	
Approach LOS		C			D			D			D	

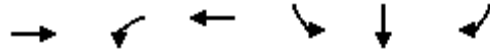
Intersection Summary

HCM 2000 Control Delay	38.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.9
Intersection Capacity Utilization	77.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	175	54	42	101	580	328	620	182	8	366	80
Future Volume (veh/h)	80	175	54	42	101	580	328	620	182	8	366	80
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	82	179	38	43	103	580	323	650	146	8	373	64
Adj No. of Lanes	1	2	1	2	2	0	1	2	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	131	1257	958	98	539	482	427	949	403	265	560	250
Arrive On Green	0.08	0.37	0.37	0.03	0.32	0.32	0.26	0.26	0.26	0.16	0.16	0.16
Sat Flow, veh/h	1619	3420	1508	2956	1710	1529	1619	3600	1530	1619	3420	1530
Grp Volume(v), veh/h	82	179	38	43	103	580	323	650	146	8	373	64
Grp Sat Flow(s),veh/h/ln	1619	1710	1508	1478	1710	1529	1619	1800	1530	1619	1710	1530
Q Serve(g_s), s	5.4	3.8	1.0	1.6	4.8	34.7	20.2	17.8	8.5	0.5	11.3	4.0
Cycle Q Clear(g_c), s	5.4	3.8	1.0	1.6	4.8	34.7	20.2	17.8	8.5	0.5	11.3	4.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	131	1257	958	98	539	482	427	949	403	265	560	250
V/C Ratio(X)	0.63	0.14	0.04	0.44	0.19	1.20	0.76	0.68	0.36	0.03	0.67	0.26
Avail Cap(c_a), veh/h	138	1257	958	196	539	482	427	949	403	265	560	250
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.9	23.2	7.7	52.2	27.4	37.7	37.3	36.4	33.0	38.7	43.2	40.2
Incr Delay (d2), s/veh	5.2	0.2	0.1	1.1	0.2	109.7	11.8	4.0	2.5	0.2	6.2	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	1.9	0.8	0.7	2.3	29.3	10.4	9.4	3.9	0.2	5.8	1.9
LnGrp Delay(d),s/veh	54.1	23.4	7.7	53.3	27.6	147.4	49.1	40.4	35.5	38.9	49.4	42.6
LnGrp LOS	D	C	A	D	C	F	D	D	D	D	D	D
Approach Vol, veh/h		299			726			1119			445	
Approach Delay, s/veh		29.9			124.8			42.3			48.2	
Approach LOS		C			F			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.3	45.5		22.6	14.0	39.8		33.6				
Change Period (Y+Rc), s	4.6	5.1		4.6	5.1	* 5.1		4.6				
Max Green Setting (Gmax), s	7.3	36.8		18.0	9.4	* 35		29.0				
Max Q Clear Time (g_c+I1), s	3.6	5.8		13.3	7.4	36.7		22.2				
Green Ext Time (p_c), s	0.0	1.3		1.2	0.1	0.0		3.1				
Intersection Summary												
HCM 2010 Ctrl Delay			65.0									
HCM 2010 LOS			E									
Notes												

Timings
1: I-215 SB Ramps & Auto Center Rd.

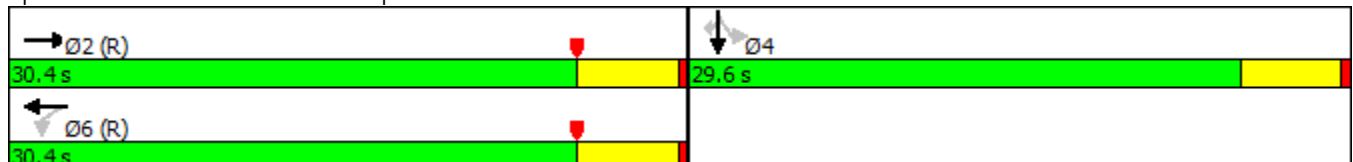


Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Configurations	↑↑		↑↑	↖	↖	↖
Traffic Volume (vph)	438	8	318	554	101	268
Future Volume (vph)	438	8	318	554	101	268
Turn Type	NA	Perm	NA	Perm	NA	Perm
Protected Phases	2		6		4	
Permitted Phases		6		4		4
Detector Phase	2	6	6	4	4	4
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	30.0	22.5	22.5	22.5	22.5	22.5
Total Split (s)	30.4	30.4	30.4	29.6	29.6	29.6
Total Split (%)	50.7%	50.7%	50.7%	49.3%	49.3%	49.3%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0		5.0	5.0	5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	Max	Max	Max
Act Effct Green (s)	25.4		25.4	24.6	24.6	24.6
Actuated g/C Ratio	0.42		0.42	0.41	0.41	0.41
v/c Ratio	0.40		0.22	0.49	0.46	0.31
Control Delay	10.4		6.3	16.0	15.5	2.8
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	10.4		6.3	16.0	15.5	2.8
LOS	B		A	B	B	A
Approach Delay	10.4		6.3		12.0	
Approach LOS	B		A		B	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 50 (83%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.49
 Intersection Signal Delay: 10.5
 Intersection Capacity Utilization 48.2%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 1: I-215 SB Ramps & Auto Center Rd.



HCM Signalized Intersection Capacity Analysis
 1: I-215 SB Ramps & Auto Center Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017




















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑					↖	↗	↘
Traffic Volume (vph)	0	438	174	8	318	0	0	0	0	554	101	268
Future Volume (vph)	0	438	174	8	318	0	0	0	0	554	101	268
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		5.0			5.0					5.0	5.0	5.0
Lane Util. Factor		0.95			0.95					0.95	0.95	1.00
Frbp, ped/bikes		0.99			1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00			1.00					1.00	1.00	1.00
Frt		0.96			1.00					1.00	1.00	0.85
Flt Protected		1.00			1.00					0.95	0.97	1.00
Satd. Flow (prot)		3600			3600					1700	1800	1800
Flt Permitted		1.00			0.94					0.95	0.97	1.00
Satd. Flow (perm)		3600			3600					1700	1800	1800
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	456	181	8	331	0	0	0	0	577	105	279
RTOR Reduction (vph)	0	70	0	0	0	0	0	0	0	0	0	165
Lane Group Flow (vph)	0	567	0	0	339	0	0	0	0	340	342	114
Confl. Peds. (#/hr)			1									
Confl. Bikes (#/hr)			1									
Turn Type		NA		Perm	NA					Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases				6						4		4
Actuated Green, G (s)		25.4			25.4					24.6	24.6	24.6
Effective Green, g (s)		25.4			25.4					24.6	24.6	24.6
Actuated g/C Ratio		0.42			0.42					0.41	0.41	0.41
Clearance Time (s)		5.0			5.0					5.0	5.0	5.0
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1524			1524					697	738	738
v/s Ratio Prot		c0.16										
v/s Ratio Perm					0.09					c0.20	0.19	0.06
v/c Ratio		0.37			0.22					0.49	0.46	0.16
Uniform Delay, d1		11.8			11.0					13.1	12.9	11.2
Progression Factor		1.00			0.54					1.00	1.00	1.00
Incremental Delay, d2		0.7			0.3					2.4	2.1	0.4
Delay (s)		12.5			6.2					15.5	15.0	11.6
Level of Service		B			A					B	B	B
Approach Delay (s)		12.5			6.2			0.0			14.2	
Approach LOS		B			A			A			B	

Intersection Summary

HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	48.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	438	174	8	318	0	0	0	0	554	101	268
Future Volume (veh/h)	0	438	174	8	318	0	0	0	0	554	101	268
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1800	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	456	130	8	331	0				652	0	158
Adj No. of Lanes	0	2	0	0	2	0				2	0	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1109	313	71	1403	0				1328	0	627
Arrive On Green	0.00	0.42	0.42	0.85	0.85	0.00				0.41	0.00	0.41
Sat Flow, veh/h	0	2709	740	20	3395	0				3238	0	1530
Grp Volume(v), veh/h	0	296	290	181	158	0				652	0	158
Grp Sat Flow(s),veh/h/ln	0	1710	1650	1777	1556	0				1619	0	1530
Q Serve(g_s), s	0.0	7.3	7.4	0.0	1.2	0.0				8.9	0.0	4.1
Cycle Q Clear(g_c), s	0.0	7.3	7.4	1.2	1.2	0.0				8.9	0.0	4.1
Prop In Lane	0.00		0.45	0.04		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	724	698	815	659	0				1328	0	627
V/C Ratio(X)	0.00	0.41	0.41	0.22	0.24	0.00				0.49	0.00	0.25
Avail Cap(c_a), veh/h	0	724	698	815	659	0				1328	0	627
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	12.1	12.1	2.7	2.7	0.0				13.1	0.0	11.6
Incr Delay (d2), s/veh	0.0	1.7	1.8	0.6	0.9	0.0				1.3	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.7	3.7	0.6	0.6	0.0				4.2	0.0	1.9
LnGrp Delay(d),s/veh	0.0	13.8	13.9	3.4	3.6	0.0				14.4	0.0	12.6
LnGrp LOS		B	B	A	A					B		B
Approach Vol, veh/h		586			339						810	
Approach Delay, s/veh		13.8			3.5						14.0	
Approach LOS		B			A						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		30.4		29.6		30.4						
Change Period (Y+Rc), s		5.0		5.0		5.0						
Max Green Setting (Gmax), s		25.4		24.6		25.4						
Max Q Clear Time (g_c+I1), s		9.4		10.9		3.2						
Green Ext Time (p_c), s		4.8		2.5		5.4						
Intersection Summary												
HCM 2010 Ctrl Delay				11.9								
HCM 2010 LOS				B								
Notes												

Timings

2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations	↶	↷↷	↷↷	↷	↶	↷	↷↷
Traffic Volume (vph)	222	770	827	634	116	7	905
Future Volume (vph)	222	770	827	634	116	7	905
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm
Protected Phases	5	2	6		8	8	
Permitted Phases				6			8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	8.0	8.0	8.0	5.0	5.0	5.0
Minimum Split (s)	8.5	39.0	13.0	13.0	10.0	10.0	10.0
Total Split (s)	9.8	39.0	29.2	29.2	21.0	21.0	21.0
Total Split (%)	16.3%	65.0%	48.7%	48.7%	35.0%	35.0%	35.0%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max
Act Effct Green (s)	6.3	34.0	24.2	24.2	16.0	16.0	16.0
Actuated g/C Ratio	0.10	0.57	0.40	0.40	0.27	0.27	0.27
v/c Ratio	1.28	0.39	0.58	0.58	0.14	0.13	0.78
Control Delay	184.5	4.8	11.4	3.7	17.8	17.7	18.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Total Delay	184.5	4.8	11.4	3.7	17.8	17.7	19.1
LOS	F	A	B	A	B	B	B
Approach Delay		45.1	8.0			19.0	
Approach LOS		D	A			B	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 43 (72%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.28
 Intersection Signal Delay: 21.8
 Intersection LOS: C
 Intersection Capacity Utilization 71.0%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.



























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↗	↗↗			
Traffic Volume (vph)	222	770	0	0	827	634	116	7	905	0	0	0
Future Volume (vph)	222	770	0	0	827	634	116	7	905	0	0	0
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800	1700	1800	1800	1800	1800	1800
Total Lost time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	0.88			
Frbp, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.96	1.00			
Satd. Flow (prot)	1700	3600			3600	1800	1700	1800	3600			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.96	1.00			
Satd. Flow (perm)	1700	3600			3600	1800	1700	1800	3600			
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	227	786	0	0	844	647	118	7	923	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	386	0	0	227	0	0	0
Lane Group Flow (vph)	227	786	0	0	844	261	63	62	696	0	0	0
Confl. Peds. (#/hr)			1									
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	6.3	34.0			24.2	24.2	16.0	16.0	16.0			
Effective Green, g (s)	6.3	34.0			24.2	24.2	16.0	16.0	16.0			
Actuated g/C Ratio	0.10	0.57			0.40	0.40	0.27	0.27	0.27			
Clearance Time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Vehicle Extension (s)	2.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	178	2040			1452	726	453	480	960			
v/s Ratio Prot	c0.13	0.22			c0.23		0.04	0.03				
v/s Ratio Perm						0.14			c0.19			
v/c Ratio	1.28	0.39			0.58	0.36	0.14	0.13	0.72			
Uniform Delay, d1	26.9	7.2			14.0	12.5	16.8	16.7	20.0			
Progression Factor	0.85	0.59			0.73	2.40	1.00	1.00	1.00			
Incremental Delay, d2	157.5	0.5			1.0	0.8	0.6	0.6	4.8			
Delay (s)	180.3	4.7			11.3	30.8	17.4	17.3	24.8			
Level of Service	F	A			B	C	B	B	C			
Approach Delay (s)		44.1			19.8			23.9			0.0	
Approach LOS		D			B			C			A	

Intersection Summary

HCM 2000 Control Delay	27.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 				 			
Traffic Volume (veh/h)	222	770	0	0	827	634	116	7	905	0	0	0
Future Volume (veh/h)	222	770	0	0	827	634	116	7	905	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1700	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	227	786	0	0	844	443	123	0	589			
Adj No. of Lanes	1	2	0	0	2	1	2	0	2			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	170	1938	0	0	1379	617	863	0	816			
Arrive On Green	0.11	0.57	0.00	0.00	0.40	0.40	0.27	0.00	0.27			
Sat Flow, veh/h	1619	3510	0	0	3510	1530	3238	0	3060			
Grp Volume(v), veh/h	227	786	0	0	844	443	123	0	589			
Grp Sat Flow(s),veh/h/ln	1619	1710	0	0	1710	1530	1619	0	1530			
Q Serve(g_s), s	6.3	7.8	0.0	0.0	11.7	14.6	1.7	0.0	10.5			
Cycle Q Clear(g_c), s	6.3	7.8	0.0	0.0	11.7	14.6	1.7	0.0	10.5			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	170	1938	0	0	1379	617	863	0	816			
V/C Ratio(X)	1.34	0.41	0.00	0.00	0.61	0.72	0.14	0.00	0.72			
Avail Cap(c_a), veh/h	170	1938	0	0	1379	617	863	0	816			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.50	0.50	1.00	0.00	1.00			
Uniform Delay (d), s/veh	26.9	7.3	0.0	0.0	14.2	15.0	16.8	0.0	20.0			
Incr Delay (d2), s/veh	185.2	0.6	0.0	0.0	1.0	3.6	0.3	0.0	5.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	11.5	3.8	0.0	0.0	5.7	6.7	0.8	0.0	5.0			
LnGrp Delay(d),s/veh	212.1	7.9	0.0	0.0	15.2	18.7	17.1	0.0	25.5			
LnGrp LOS	F	A			B	B	B		C			
Approach Vol, veh/h		1013			1287			712				
Approach Delay, s/veh		53.7			16.4			24.0				
Approach LOS		D			B			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		39.0			9.8	29.2		21.0				
Change Period (Y+Rc), s		5.0			3.5	5.0		5.0				
Max Green Setting (Gmax), s		34.0			6.3	24.2		16.0				
Max Q Clear Time (g_c+I1), s		9.8			8.3	16.6		12.5				
Green Ext Time (p_c), s		14.2			0.0	6.0		1.1				
Intersection Summary												
HCM 2010 Ctrl Delay				30.7								
HCM 2010 LOS				C								
Notes												

Timings
3: E St. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

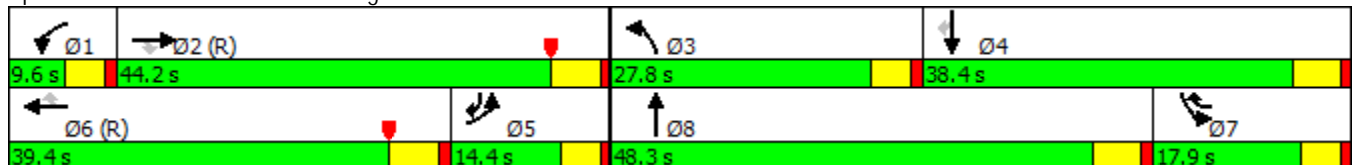


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑	↗	↔↔	↑↑	↗	↗	↑↔	↔↔	↑↑	↗
Traffic Volume (vph)	230	1093	344	146	826	122	307	374	220	260	250
Future Volume (vph)	230	1093	344	146	826	122	307	374	220	260	250
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8	7	4	5
Permitted Phases			2			6					4
Detector Phase	5	2	2	1	6	7	3	8	7	4	5
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0
Minimum Split (s)	9.6	39.4	39.4	9.6	39.4	9.6	9.6	38.4	9.6	38.4	9.6
Total Split (s)	14.4	44.2	44.2	9.6	39.4	17.9	27.8	48.3	17.9	38.4	14.4
Total Split (%)	12.0%	36.8%	36.8%	8.0%	32.8%	14.9%	23.2%	40.3%	14.9%	32.0%	12.0%
Yellow Time (s)	3.6	4.4	4.4	3.6	4.4	3.6	3.6	4.4	3.6	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4	4.6	5.4	4.6
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	Max	None	Max	None
Act Effct Green (s)	9.8	38.8	38.8	5.0	34.0	52.7	23.2	42.9	13.3	33.0	43.6
Actuated g/C Ratio	0.08	0.32	0.32	0.04	0.28	0.44	0.19	0.36	0.11	0.28	0.36
v/c Ratio	0.92	0.98	0.46	1.14	0.84	0.15	1.04	0.41	0.65	0.27	0.36
Control Delay	89.3	61.0	11.0	153.7	52.0	8.7	108.2	27.2	60.3	35.0	9.8
Queue Delay	0.0	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.3	66.2	11.0	153.7	52.0	8.7	108.2	27.2	60.3	35.0	9.8
LOS	F	E	B	F	D	A	F	C	E	D	A
Approach Delay		58.0			60.8			57.4		34.0	
Approach LOS		E			E			E		C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 108 (90%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.14
 Intersection Signal Delay: 54.5
 Intersection LOS: D
 Intersection Capacity Utilization 101.2%
 ICU Level of Service G
 Analysis Period (min) 15

























Splits and Phases: 3: E St. & Orange Show Rd.



























HCM Signalized Intersection Capacity Analysis
3: E St. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	230	1093	344	146	826	122	307	374	141	220	260	250
Future Volume (vph)	230	1093	344	146	826	122	307	374	141	220	260	250
Ideal Flow (vphp)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Total Lost time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95		0.97	0.95	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3200	3600	1800	3200	3600	1800	1600	3600		3200	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3200	3600	1800	3200	3600	1800	1600	3600		3200	3600	1800
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	240	1139	358	152	860	127	320	390	147	229	271	260
RTOR Reduction (vph)	0	0	197	0	0	68	0	32	0	0	0	68
Lane Group Flow (vph)	240	1139	161	152	860	59	320	505	0	229	271	192
Confl. Peds. (#/hr)									2			2
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	9.8	38.8	38.8	5.0	34.0	47.3	23.2	42.9		13.3	33.0	42.8
Effective Green, g (s)	9.8	38.8	38.8	5.0	34.0	47.3	23.2	42.9		13.3	33.0	42.8
Actuated g/C Ratio	0.08	0.32	0.32	0.04	0.28	0.39	0.19	0.36		0.11	0.28	0.36
Clearance Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	2.0	2.0	3.0		2.0	3.0	2.0
Lane Grp Cap (vph)	261	1164	582	133	1020	778	309	1287		354	990	642
v/s Ratio Prot	0.07	c0.32		0.05	c0.24	0.01	c0.20	c0.14		c0.07	0.08	0.02
v/s Ratio Perm			0.09			0.02						0.08
v/c Ratio	0.92	0.98	0.28	1.14	0.84	0.08	1.04	0.39		0.65	0.27	0.30
Uniform Delay, d1	54.7	40.2	30.2	57.5	40.5	22.7	48.4	28.8		51.1	34.1	27.8
Progression Factor	1.02	1.03	1.37	0.80	1.12	1.78	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	29.6	19.2	1.0	110.5	6.4	0.0	60.7	0.9		3.0	0.7	0.1
Delay (s)	85.3	60.8	42.3	156.8	51.6	40.3	109.1	29.7		54.1	34.8	27.9
Level of Service	F	E	D	F	D	D	F	C		D	C	C
Approach Delay (s)		60.4			64.4			59.4			38.3	
Approach LOS		E			E			E			D	
Intersection Summary												
HCM 2000 Control Delay			57.5									E
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			120.0							20.0		
Intersection Capacity Utilization			101.2%									G
Analysis Period (min)			15									
c Critical Lane Group												

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	1093	344	146	826	122	307	374	141	220	260	250
Future Volume (veh/h)	230	1093	344	146	826	122	307	374	141	220	260	250
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	240	1139	182	152	860	71	320	390	116	229	271	153
Adj No. of Lanes	2	2	1	2	2	1	1	2	0	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	611	1556	696	123	969	593	295	932	274	308	940	736
Arrive On Green	0.41	0.91	0.91	0.01	0.09	0.09	0.19	0.36	0.36	0.10	0.28	0.28
Sat Flow, veh/h	2956	3420	1530	2956	3420	1530	1524	2607	766	2956	3420	1527
Grp Volume(v), veh/h	240	1139	182	152	860	71	320	254	252	229	271	153
Grp Sat Flow(s),veh/h/ln	1478	1710	1530	1478	1710	1530	1524	1710	1663	1478	1710	1527
Q Serve(g_s), s	6.8	10.8	1.7	5.0	29.8	0.0	23.2	13.5	13.7	9.0	7.5	3.1
Cycle Q Clear(g_c), s	6.8	10.8	1.7	5.0	29.8	0.0	23.2	13.5	13.7	9.0	7.5	3.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.46	1.00		1.00
Lane Grp Cap(c), veh/h	611	1556	696	123	969	593	295	611	595	308	941	736
V/C Ratio(X)	0.39	0.73	0.26	1.23	0.89	0.12	1.09	0.42	0.42	0.74	0.29	0.21
Avail Cap(c_a), veh/h	611	1556	696	123	969	593	295	611	595	328	941	736
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.77	0.77	0.77	0.69	0.69	0.69	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.9	3.4	3.0	59.2	52.5	30.2	48.4	29.1	29.2	52.2	34.3	10.8
Incr Delay (d2), s/veh	0.1	2.4	0.7	144.0	8.6	0.3	77.4	2.1	2.2	7.1	0.8	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	4.9	0.8	4.5	15.3	2.0	16.1	6.7	6.7	4.0	3.6	2.0
LnGrp Delay(d),s/veh	30.1	5.8	3.7	203.2	61.1	30.5	125.8	31.2	31.4	59.3	35.0	11.4
LnGrp LOS	C	A	A	F	E	C	F	C	C	E	D	B
Approach Vol, veh/h		1561			1083			826			653	
Approach Delay, s/veh		9.3			79.0			67.9			38.0	
Approach LOS		A			E			E			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.6	60.1	27.8	38.4	30.3	39.4	17.9	48.3				
Change Period (Y+Rc), s	4.6	5.4	4.6	5.4	5.4	* 5.4	5.4	* 5.4				
Max Green Setting (Gmax), s	5.0	38.8	23.2	33.0	9.8	* 34	13.3	* 43				
Max Q Clear Time (g_c+I1), s	7.0	12.8	25.2	9.5	8.8	31.8	11.0	15.7				
Green Ext Time (p_c), s	0.0	13.7	0.0	2.5	0.3	1.4	0.7	3.0				
Intersection Summary												
HCM 2010 Ctrl Delay			43.9									
HCM 2010 LOS			D									
Notes												

Timings

4: Arrowhead Av. & Orange Show Rd.

3/27/2017

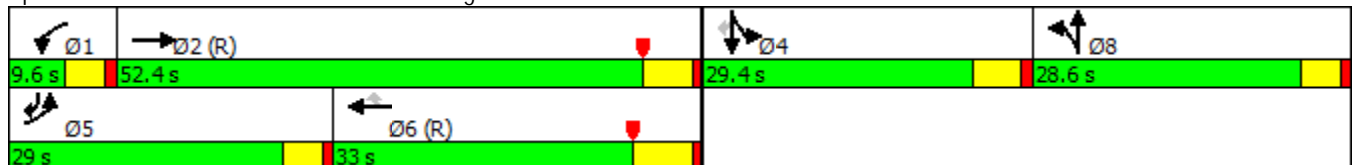


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	288	1003	10	626	135	20	9	183	2	481
Future Volume (vph)	288	1003	10	626	135	20	9	183	2	481
Turn Type	Prot	NA	Prot	NA	Perm	Split	NA	Split	NA	pm+ov
Protected Phases	5	2	1	6		8	8	4	4	5
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	8	8	4	4	5
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	28.4	9.6	29.2	29.2	28.6	28.6	29.4	29.4	9.6
Total Split (s)	29.0	52.4	9.6	33.0	33.0	28.6	28.6	29.4	29.4	29.0
Total Split (%)	24.2%	43.7%	8.0%	27.5%	27.5%	23.8%	23.8%	24.5%	24.5%	24.2%
Yellow Time (s)	3.6	4.4	3.6	5.2	5.2	3.6	3.6	4.4	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	6.2	6.2	4.6	4.6	5.4	5.4	4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	C-Max	None	C-Max	C-Max	Max	Max	Max	Max	None
Act Effct Green (s)	23.5	54.7	5.0	27.7	27.7	24.0	24.0	24.0	24.0	48.3
Actuated g/C Ratio	0.20	0.46	0.04	0.23	0.23	0.20	0.20	0.20	0.20	0.40
v/c Ratio	0.93	0.66	0.16	0.81	0.27	0.06	0.13	0.29	0.28	0.52
Control Delay	74.8	9.8	60.7	52.7	7.3	39.6	16.4	43.5	43.2	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.8	9.8	60.7	52.7	7.3	39.6	16.4	43.5	43.2	3.8
LOS	E	A	E	D	A	D	B	D	D	A
Approach Delay		24.3		44.9			23.5		14.8	
Approach LOS		C		D			C		B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 32 (27%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 27.7
 Intersection LOS: C
 Intersection Capacity Utilization 84.7%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 4: Arrowhead Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
4: Arrowhead Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017




























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	288	1003	4	10	626	135	20	9	37	183	2	481
Future Volume (vph)	288	1003	4	10	626	135	20	9	37	183	2	481
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	6.2	6.2	4.6	4.6		5.4	5.4	4.6
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		0.95	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	0.97		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.88		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00
Satd. Flow (prot)	1700	3600		1700	3600	1800	1700	1800		1700	1800	1800
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00
Satd. Flow (perm)	1700	3600		1700	3600	1800	1700	1800		1700	1800	1800
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	310	1078	4	11	673	145	22	10	40	197	2	517
RTOR Reduction (vph)	0	0	0	0	0	112	0	32	0	0	0	277
Lane Group Flow (vph)	310	1082	0	11	673	33	22	18	0	98	101	240
Confl. Peds. (#/hr)									15			23
Confl. Bikes (#/hr)												1
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		8	8		4	4	5
Permitted Phases						6						4
Actuated Green, G (s)	23.5	51.0		1.0	27.7	27.7	24.0	24.0		24.0	24.0	47.5
Effective Green, g (s)	23.5	51.0		1.0	27.7	27.7	24.0	24.0		24.0	24.0	47.5
Actuated g/C Ratio	0.20	0.42		0.01	0.23	0.23	0.20	0.20		0.20	0.20	0.40
Clearance Time (s)	4.6	5.4		4.6	6.2	6.2	4.6	4.6		5.4	5.4	4.6
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	3.0	3.0		3.0	3.0	2.0
Lane Grp Cap (vph)	332	1530		14	831	415	340	360		340	360	712
v/s Ratio Prot	c0.18	0.30		0.01	c0.19		c0.01	0.01		0.06	0.06	c0.07
v/s Ratio Perm						0.02						0.07
v/c Ratio	0.93	0.71		0.79	0.81	0.08	0.06	0.05		0.29	0.28	0.34
Uniform Delay, d1	47.5	28.4		59.4	43.7	36.2	38.9	38.8		40.7	40.7	25.3
Progression Factor	1.15	0.34		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	18.9	1.3		123.8	8.4	0.4	0.4	0.3		2.1	1.9	0.1
Delay (s)	73.3	10.8		183.2	52.1	36.6	39.3	39.1		42.9	42.6	25.4
Level of Service	E	B		F	D	D	D	D		D	D	C
Approach Delay (s)		24.7			51.1			39.1			30.2	
Approach LOS		C			D			D			C	

Intersection Summary

HCM 2000 Control Delay	33.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.8
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (veh/h)	288	1003	4	10	626	135	20	9	37	183	2	481
Future Volume (veh/h)	288	1003	4	10	626	135	20	9	37	183	2	481
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	310	1078	4	11	673	93	22	10	25	198	0	448
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	327	1446	5	21	769	344	324	90	225	648	0	600
Arrive On Green	0.40	0.83	0.83	0.01	0.22	0.22	0.20	0.20	0.20	0.20	0.00	0.20
Sat Flow, veh/h	1619	3495	13	1619	3420	1530	1619	449	1123	3238	0	1458
Grp Volume(v), veh/h	310	527	555	11	673	93	22	0	35	198	0	448
Grp Sat Flow(s),veh/h/ln	1619	1710	1798	1619	1710	1530	1619	0	1572	1619	0	1458
Q Serve(g_s), s	22.2	16.6	16.6	0.8	22.8	6.0	1.3	0.0	2.2	6.3	0.0	24.0
Cycle Q Clear(g_c), s	22.2	16.6	16.6	0.8	22.8	6.0	1.3	0.0	2.2	6.3	0.0	24.0
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.71	1.00		1.00
Lane Grp Cap(c), veh/h	327	708	744	21	769	344	324	0	314	648	0	600
V/C Ratio(X)	0.95	0.75	0.75	0.53	0.88	0.27	0.07	0.00	0.11	0.31	0.00	0.75
Avail Cap(c_a), veh/h	329	708	744	67	769	344	324	0	314	648	0	600
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.27	0.27	0.27	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.2	7.5	7.5	58.9	44.9	38.4	38.9	0.0	39.3	40.9	0.0	31.0
Incr Delay (d2), s/veh	14.8	1.9	1.9	7.6	13.3	1.9	0.4	0.0	0.7	1.2	0.0	8.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.2	7.7	8.1	0.4	12.2	2.7	0.6	0.0	1.0	2.9	0.0	14.0
LnGrp Delay(d),s/veh	49.9	9.4	9.3	66.5	58.2	40.3	39.3	0.0	40.0	42.1	0.0	39.2
LnGrp LOS	D	A	A	E	E	D	D		D	D		D
Approach Vol, veh/h		1392			777			57			646	
Approach Delay, s/veh		18.4			56.1			39.7			40.1	
Approach LOS		B			E			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.1	55.9		29.4	28.8	33.2		28.6				
Change Period (Y+Rc), s	4.6	* 6.2		5.4	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.0	* 47		24.0	24.4	26.8		24.0				
Max Q Clear Time (g_c+I1), s	2.8	18.6		26.0	24.2	24.8		4.2				
Green Ext Time (p_c), s	0.0	18.5		0.0	0.0	1.8		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			33.9									
HCM 2010 LOS			C									
Notes												

Timings

5: Washington Av./Washington Av. & Orange Show Rd.

3/27/2017

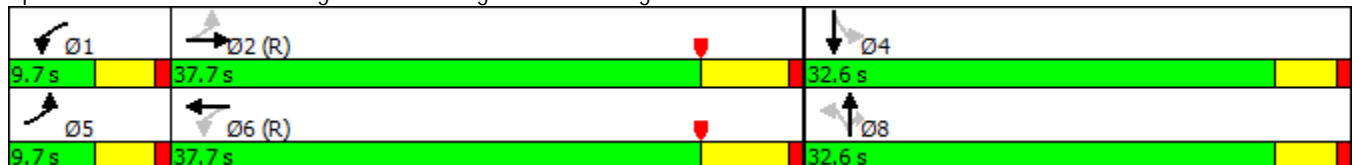


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↙	↕	↙	↕		↕	↗		↕
Traffic Volume (vph)	33	1217	4	730	15	2	5	1	1
Future Volume (vph)	33	1217	4	730	15	2	5	1	1
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	Perm	NA
Protected Phases	5	2	1	6		8			4
Permitted Phases	2		6		8		8	4	
Detector Phase	5	2	1	6	8	8	8	4	4
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	9.6	23.2	32.6	32.6	32.6	32.6	32.6
Total Split (s)	9.7	37.7	9.7	37.7	32.6	32.6	32.6	32.6	32.6
Total Split (%)	12.1%	47.1%	12.1%	47.1%	40.8%	40.8%	40.8%	40.8%	40.8%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6	4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None
Act Effect Green (s)	67.8	66.2	66.8	61.0		13.6	13.6		13.6
Actuated g/C Ratio	0.85	0.83	0.84	0.76		0.17	0.17		0.17
v/c Ratio	0.02	0.45	0.00	0.30		0.06	0.01		0.04
Control Delay	4.9	8.8	6.0	7.8		24.6	0.0		12.8
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Delay	4.9	8.8	6.0	7.8		24.6	0.0		12.8
LOS	A	A	A	A		C	A		B
Approach Delay		8.7		7.8		19.3			12.8
Approach LOS		A		A		B			B

Intersection Summary

Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.45
 Intersection Signal Delay: 8.5
 Intersection Capacity Utilization 65.4%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service C

Splits and Phases: 5: Washington Av./Washington Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
5: Washington Av./Washington Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)




















3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↖	↗		↕	
Traffic Volume (vph)	33	1217	11	4	730	8	15	2	5	1	1	11
Future Volume (vph)	33	1217	11	4	730	8	15	2	5	1	1	11
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2		4.6	6.2			4.6	4.6		4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85		0.88	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		1.00	
Satd. Flow (prot)	1700	3600		1700	3600			1800	1800		1800	
Flt Permitted	0.32	1.00		0.17	1.00			0.75	1.00		0.98	
Satd. Flow (perm)	1700	3600		1700	3600			1800	1800		1800	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	36	1337	12	4	802	9	16	2	5	1	1	12
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	5	0	11	0
Lane Group Flow (vph)	36	1349	0	4	810	0	0	18	0	0	3	0
Confl. Bikes (#/hr)			1									1
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)	59.0	56.0		55.0	54.0			7.6	7.6		7.6	
Effective Green, g (s)	59.0	56.0		55.0	54.0			7.6	7.6		7.6	
Actuated g/C Ratio	0.74	0.70		0.69	0.68			0.09	0.09		0.09	
Clearance Time (s)	4.6	6.2		4.6	6.2			4.6	4.6		4.6	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	1253	2520		1168	2430			171	171		171	
v/s Ratio Prot	c0.00	c0.37		0.00	0.23							
v/s Ratio Perm	0.02			0.00				0.01	0.00		0.00	
v/c Ratio	0.03	0.54		0.00	0.33			0.11	0.00		0.02	
Uniform Delay, d1	2.9	5.8		4.3	5.5			33.1	32.8		32.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.0	0.8		0.0	0.4			0.3	0.0		0.0	
Delay (s)	2.9	6.6		4.3	5.8			33.4	32.8		32.9	
Level of Service	A	A		A	A			C	C		C	
Approach Delay (s)		6.5			5.8			33.2			32.9	
Approach LOS		A			A			C			C	

Intersection Summary

HCM 2000 Control Delay	6.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.4
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	1217	11	4	730	8	15	2	5	1	1	11
Future Volume (veh/h)	33	1217	11	4	730	8	15	2	5	1	1	11
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	36	1337	12	4	802	9	16	2	4	1	1	2
Adj No. of Lanes	1	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	554	2595	23	327	2488	28	153	14	84	68	32	44
Arrive On Green	0.03	0.75	0.75	0.01	0.72	0.72	0.05	0.05	0.05	0.05	0.05	0.05
Sat Flow, veh/h	1619	3473	31	1619	3464	39	1232	256	1530	206	591	797
Grp Volume(v), veh/h	36	658	691	4	396	415	18	0	4	4	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1794	1619	1710	1793	1488	0	1530	1593	0	0
Q Serve(g_s), s	0.5	12.6	12.7	0.1	6.8	6.8	0.6	0.0	0.2	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.5	12.6	12.7	0.1	6.8	6.8	0.9	0.0	0.2	0.2	0.0	0.0
Prop In Lane	1.00		0.02	1.00		0.02	0.89		1.00	0.25		0.50
Lane Grp Cap(c), veh/h	554	1278	1341	327	1228	1288	167	0	84	144	0	0
V/C Ratio(X)	0.06	0.52	0.52	0.01	0.32	0.32	0.11	0.00	0.05	0.03	0.00	0.00
Avail Cap(c_a), veh/h	602	1278	1341	422	1228	1288	600	0	535	601	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.40	0.40	0.40	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	2.8	4.2	4.2	3.7	4.1	4.1	36.1	0.0	35.8	35.8	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.5	1.4	0.0	0.3	0.3	0.3	0.0	0.2	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	6.4	6.7	0.0	3.3	3.4	0.4	0.0	0.1	0.1	0.0	0.0
LnGrp Delay(d),s/veh	2.8	5.6	5.6	3.7	4.4	4.4	36.4	0.0	36.1	35.9	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D		D	D		
Approach Vol, veh/h		1385			815			22				4
Approach Delay, s/veh		5.5			4.4			36.3				35.9
Approach LOS		A			A			D				D
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.0	66.0		9.0	7.4	63.7		9.0				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.1	31.5		28.0	5.1	31.5		28.0				
Max Q Clear Time (g_c+I1), s	2.1	14.7		2.2	2.5	8.8		2.9				
Green Ext Time (p_c), s	0.0	13.8		0.1	0.0	17.7		0.1				
Intersection Summary												
HCM 2010 Ctrl Delay			5.5									
HCM 2010 LOS			A									

Intersection												
Int Delay, s/veh	4.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↔	
Traffic Vol, veh/h	0	0	0	0	0	17	0	0	0	15	0	0
Future Vol, veh/h	0	0	0	0	0	17	0	0	0	15	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	54	54	54	54	54	54	54	54	54	54	54	54
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	31	0	0	0	28	0	0

Major/Minor	Major1			Major2			Minor2				
Conflicting Flow All	31	0	-	-	-	0	-	-	16	16	16
Stage 1	-	-	-	-	-	-	-	-	16	16	-
Stage 2	-	-	-	-	-	-	-	-	0	0	-
Critical Hdwy	4.1	-	-	-	-	-	-	-	6.4	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	5.4	5.5	-
Follow-up Hdwy	2.2	-	-	-	-	-	-	-	3.5	4	3.3
Pot Cap-1 Maneuver	1595	-	0	0	-	-	-	-	1008	882	1069
Stage 1	-	-	0	0	-	-	-	-	1012	886	-
Stage 2	-	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1595	-	-	-	-	-	-	-	1008	0	1069
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	1008	0	-
Stage 1	-	-	-	-	-	-	-	-	1012	0	-
Stage 2	-	-	-	-	-	-	-	-	-	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1595	-	-	-	1008
HCM Lane V/C Ratio	-	-	-	-	0.028
HCM Control Delay (s)	0	-	-	-	8.7
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Timings

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.

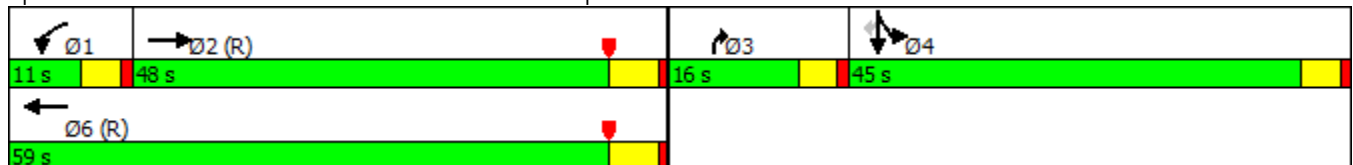


Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↖	↑↑	↗	↖	↕	↗
Traffic Volume (vph)	632	21	565	62	501	123	379
Future Volume (vph)	632	21	565	62	501	123	379
Turn Type	NA	Prot	NA	Prot	Split	NA	Perm
Protected Phases	2	1	6	3	4	4	
Permitted Phases							4
Detector Phase	2	1	6	3	4	4	4
Switch Phase							
Minimum Initial (s)	10.0	5.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	22.4	9.6	15.4	9.5	14.6	14.6	14.6
Total Split (s)	48.0	11.0	59.0	16.0	45.0	45.0	45.0
Total Split (%)	40.0%	9.2%	49.2%	13.3%	37.5%	37.5%	37.5%
Yellow Time (s)	4.4	3.6	4.4	3.5	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	4.6	5.4	4.5	4.6	4.6	4.6
Lead/Lag	Lag	Lead		Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes
Recall Mode	C-Max	None	C-Max	None	Max	Max	Max
Act Effect Green (s)	47.1	5.8	53.6	5.5	48.4	48.4	48.4
Actuated g/C Ratio	0.39	0.05	0.45	0.05	0.40	0.40	0.40
v/c Ratio	0.49	0.28	0.38	0.27	0.49	0.46	0.44
Control Delay	29.8	63.8	23.0	2.6	30.3	29.6	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	63.8	23.0	2.6	30.3	29.6	5.9
LOS	C	E	C	A	C	C	A
Approach Delay	29.8		24.5			20.9	
Approach LOS	C		C			C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 11 (9%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.49
 Intersection Signal Delay: 23.8
 Intersection LOS: C
 Intersection Capacity Utilization 53.3%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.






















HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑↑				↑	↑	↑	↑
Traffic Volume (vph)	0	632	17	21	565	0	0	0	62	501	123	379
Future Volume (vph)	0	632	17	21	565	0	0	0	62	501	123	379
Ideal Flow (vphp)	1800	1800	1800	1700	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Lane Util. Factor		0.95		1.00	0.95				1.00	0.95	0.95	1.00
Frbp, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00		1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00				1.00	0.95	0.97	1.00
Satd. Flow (prot)		3600		1700	3600				1800	1700	1800	1800
Flt Permitted		1.00		0.95	1.00				1.00	0.95	0.97	1.00
Satd. Flow (perm)		3600		1700	3600				1800	1700	1800	1800
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	680	18	23	608	0	0	0	67	539	132	408
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	65	0	0	212
Lane Group Flow (vph)	0	697	0	23	608	0	0	0	2	334	337	196
Confl. Peds. (#/hr)			3			1						
Turn Type		NA		Prot	NA				Prot	Split	NA	Perm
Protected Phases		2		1	6				3	4	4	
Permitted Phases												4
Actuated Green, G (s)		44.3		3.8	52.7				4.4	48.4	48.4	48.4
Effective Green, g (s)		44.3		3.8	52.7				4.4	48.4	48.4	48.4
Actuated g/C Ratio		0.37		0.03	0.44				0.04	0.40	0.40	0.40
Clearance Time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Vehicle Extension (s)		3.0		2.0	3.0				3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1329		53	1581				66	685	726	726
v/s Ratio Prot		c0.19		0.01	c0.17				c0.00	c0.20	0.19	
v/s Ratio Perm												0.11
v/c Ratio		0.52		0.43	0.38				0.04	0.49	0.46	0.27
Uniform Delay, d1		29.6		57.0	22.7				55.8	26.6	26.3	24.0
Progression Factor		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		1.5		2.1	0.7				0.2	2.5	2.1	0.9
Delay (s)		31.1		59.1	23.4				56.0	29.1	28.4	24.9
Level of Service		C		E	C				E	C	C	C
Approach Delay (s)		31.1			24.7			56.0			27.3	
Approach LOS		C			C			E			C	

Intersection Summary			
HCM 2000 Control Delay	28.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.1
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	632	17	21	565	0	0	0	62	501	123	379
Future Volume (veh/h)	0	632	17	21	565	0	0	0	62	501	123	379
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	0	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	680	12	23	608	0	0	0	39	336	417	406
Adj No. of Lanes	0	2	0	1	2	0	0	0	1	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1786	32	36	1984	0	0	0	0	545	606	515
Arrive On Green	0.00	0.52	0.52	0.02	0.58	0.00	0.00	0.00	0.00	0.34	0.34	0.34
Sat Flow, veh/h	0	3528	61	1619	3510	0		0		1619	1800	1530
Grp Volume(v), veh/h	0	338	354	23	608	0		0.0		336	417	406
Grp Sat Flow(s),veh/h/ln	0	1710	1789	1619	1710	0				1619	1800	1530
Q Serve(g_s), s	0.0	14.2	14.2	1.7	10.9	0.0				20.8	24.0	28.8
Cycle Q Clear(g_c), s	0.0	14.2	14.2	1.7	10.9	0.0				20.8	24.0	28.8
Prop In Lane	0.00		0.03	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	888	929	36	1984	0				545	606	515
V/C Ratio(X)	0.00	0.38	0.38	0.64	0.31	0.00				0.62	0.69	0.79
Avail Cap(c_a), veh/h	0	888	929	86	1984	0				545	606	515
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.57	0.57	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	17.3	17.3	58.2	12.9	0.0				33.3	34.4	35.9
Incr Delay (d2), s/veh	0.0	1.2	1.2	3.9	0.2	0.0				5.2	6.3	11.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.0	7.3	0.8	5.2	0.0				10.1	13.0	13.7
LnGrp Delay(d),s/veh	0.0	18.5	18.5	62.1	13.1	0.0				38.5	40.6	47.5
LnGrp LOS		B	B	E	B					D	D	D
Approach Vol, veh/h		692			631						1159	
Approach Delay, s/veh		18.5			14.9						42.4	
Approach LOS		B			B						D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	7.3	67.7		45.0		75.0						
Change Period (Y+Rc), s	4.6	5.4		4.6		5.4						
Max Green Setting (Gmax), s	6.4	42.6		40.4		53.6						
Max Q Clear Time (g_c+I1), s	3.7	16.2		30.8		12.9						
Green Ext Time (p_c), s	0.0	8.9		3.5		10.0						
Intersection Summary												
HCM 2010 Ctrl Delay				28.7								
HCM 2010 LOS				C								
Notes												

Timings

9: Waterman Av. & Orange Show Rd./Orange Show Rd.

03/27/2017

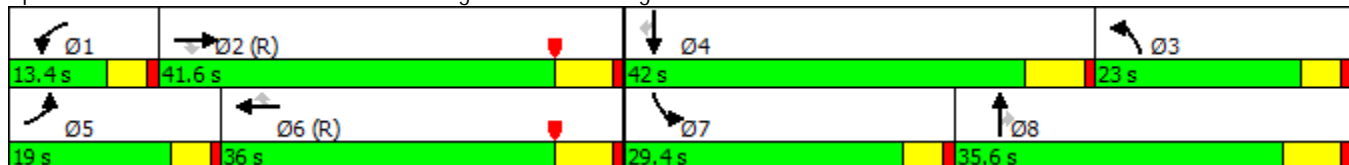


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗↗	↘	↘	↗	↘	↘	↗↗	↘	↘	↗↗	↘
Traffic Volume (vph)	168	855	217	75	445	84	208	721	130	139	752	118
Future Volume (vph)	168	855	217	75	445	84	208	721	130	139	752	118
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.2	35.2	9.6	35.2	35.2	9.6	33.2	33.2	9.6	33.2	33.2
Total Split (s)	19.0	41.6	41.6	13.4	36.0	36.0	23.0	35.6	35.6	29.4	42.0	42.0
Total Split (%)	15.8%	34.7%	34.7%	11.2%	30.0%	30.0%	19.2%	29.7%	29.7%	24.5%	35.0%	35.0%
Yellow Time (s)	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Act Effect Green (s)	13.9	38.2	38.2	8.1	30.3	30.3	18.4	39.5	39.5	14.7	35.8	35.8
Actuated g/C Ratio	0.12	0.32	0.32	0.07	0.25	0.25	0.15	0.33	0.33	0.12	0.30	0.30
v/c Ratio	0.90	0.79	0.31	0.69	1.03	0.14	0.84	0.64	0.20	0.71	0.74	0.19
Control Delay	94.4	44.0	5.5	83.7	94.9	0.5	76.9	38.0	4.3	68.0	42.8	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.4	44.0	5.5	83.7	94.9	0.5	76.9	38.0	4.3	68.0	42.8	2.2
LOS	F	D	A	F	F	A	E	D	A	E	D	A
Approach Delay		44.1			80.5			41.5			41.5	
Approach LOS		D			F			D			D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.03
 Intersection Signal Delay: 48.3
 Intersection LOS: D
 Intersection Capacity Utilization 87.9%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

03/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↘	↘	↑	↘	↘	↑↑	↘	↘	↑↑	↘
Traffic Volume (vph)	168	855	217	75	445	84	208	721	130	139	752	118
Future Volume (vph)	168	855	217	75	445	84	208	721	130	139	752	118
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	177	900	228	79	468	88	219	759	137	146	792	124
RTOR Reduction (vph)	0	0	155	0	0	66	0	0	92	0	0	87
Lane Group Flow (vph)	177	900	73	79	468	22	219	759	45	146	792	37
Confl. Peds. (#/hr)			1						1			
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	13.9	37.2	37.2	7.0	30.3	30.3	18.4	39.5	39.5	14.7	35.8	35.8
Effective Green, g (s)	13.9	37.2	37.2	7.0	30.3	30.3	18.4	39.5	39.5	14.7	35.8	35.8
Actuated g/C Ratio	0.12	0.31	0.31	0.06	0.25	0.25	0.15	0.33	0.33	0.12	0.30	0.30
Clearance Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	196	1116	558	99	454	454	260	1185	592	208	1074	537
v/s Ratio Prot	c0.10	0.25		0.05	c0.26		c0.13	0.21		0.09	c0.22	
v/s Ratio Perm			0.04			0.01			0.03			0.02
v/c Ratio	0.90	0.81	0.13	0.80	1.03	0.05	0.84	0.64	0.08	0.70	0.74	0.07
Uniform Delay, d1	52.4	38.1	29.8	55.8	44.9	33.9	49.4	34.2	27.7	50.5	37.9	30.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	37.7	6.3	0.5	32.7	50.4	0.2	20.4	2.7	0.3	8.4	4.5	0.2
Delay (s)	90.0	44.4	30.3	88.5	95.2	34.1	69.8	36.9	27.9	59.0	42.4	30.4
Level of Service	F	D	C	F	F	C	E	D	C	E	D	C
Approach Delay (s)		48.1			85.9			42.3			43.3	
Approach LOS		D			F			D			D	

























Intersection Summary		
HCM 2000 Control Delay	51.1	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.87	D
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	87.9%	21.6
Analysis Period (min)	15	ICU Level of Service
		E

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

03/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	168	855	217	75	445	84	208	721	130	139	752	118
Future Volume (veh/h)	168	855	217	75	445	84	208	721	130	139	752	118
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	177	900	175	79	468	53	219	759	86	146	792	86
Adj No. of Lanes	1	2	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	194	2186	966	98	1043	887	243	1218	544	171	1020	456
Arrive On Green	0.12	0.64	0.64	0.06	0.58	0.58	0.15	0.36	0.36	0.11	0.30	0.30
Sat Flow, veh/h	1619	3420	1510	1619	1800	1530	1619	3420	1529	1619	3420	1530
Grp Volume(v), veh/h	177	900	175	79	468	53	219	759	86	146	792	86
Grp Sat Flow(s),veh/h/ln	1619	1710	1510	1619	1800	1530	1619	1710	1529	1619	1710	1530
Q Serve(g_s), s	13.0	15.5	7.1	5.8	17.7	1.8	16.0	22.0	4.6	10.6	25.4	6.0
Cycle Q Clear(g_c), s	13.0	15.5	7.1	5.8	17.7	1.8	16.0	22.0	4.6	10.6	25.4	6.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	194	2186	966	98	1043	887	243	1218	544	171	1020	456
V/C Ratio(X)	0.91	0.41	0.18	0.81	0.45	0.06	0.90	0.62	0.16	0.85	0.78	0.19
Avail Cap(c_a), veh/h	194	2186	966	119	1043	887	248	1218	544	335	1020	456
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.89	0.89	0.89	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.2	10.6	13.7	55.7	14.3	11.0	50.1	32.0	26.4	52.8	38.4	44.1
Incr Delay (d2), s/veh	36.9	0.5	0.4	23.6	1.4	0.1	31.3	2.4	0.6	4.6	5.8	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.8	7.4	3.0	3.2	9.1	0.8	9.2	10.8	2.0	5.0	12.8	2.6
LnGrp Delay(d),s/veh	89.0	11.1	14.0	79.4	15.7	11.1	81.4	34.4	27.0	57.4	44.2	45.0
LnGrp LOS	F	B	B	E	B	B	F	C	C	E	D	D
Approach Vol, veh/h		1252			600			1064			1024	
Approach Delay, s/veh		22.5			23.7			43.5			46.2	
Approach LOS		C			C			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.8	84.1	24.2	42.0	19.0	76.9	17.3	48.9				
Change Period (Y+Rc), s	4.6	6.2	6.2	* 6.2	4.6	6.2	4.6	6.2				
Max Green Setting (Gmax), s	8.8	35.4	18.4	* 36	14.4	29.8	24.8	29.4				
Max Q Clear Time (g_c+I1), s	7.8	17.5	18.0	27.4	15.0	19.7	12.6	24.0				
Green Ext Time (p_c), s	0.0	11.5	0.1	3.3	0.0	7.4	0.1	2.4				
Intersection Summary												
HCM 2010 Ctrl Delay			34.5									
HCM 2010 LOS			C									
Notes												

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↕	
Traffic Vol, veh/h	2	11	9	1057	1012	4
Future Vol, veh/h	2	11	9	1057	1012	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	75	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	2	12	10	1149	1100	4

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1696	552	1104 0
Stage 1	1102	-	- -
Stage 2	594	-	- -
Critical Hdwy	6.8	6.9	4.1 -
Critical Hdwy Stg 1	5.8	-	- -
Critical Hdwy Stg 2	5.8	-	- -
Follow-up Hdwy	3.5	3.3	2.2 -
Pot Cap-1 Maneuver	*85	*671	*1008 -
Stage 1	*633	-	- -
Stage 2	*614	-	- -
Platoon blocked, %		1	1 -
Mov Cap-1 Maneuver	*84	*671	*1008 -
Mov Cap-2 Maneuver	*321	-	- -
Stage 1	*633	-	- -
Stage 2	*608	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	11.4	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	* 1008	-	321	671	-	-
HCM Lane V/C Ratio	0.01	-	0.007	0.018	-	-
HCM Control Delay (s)	8.6	-	16.3	10.5	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0	0.1	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Timings
11: Waterman Av. & Driveway 2/Park Center Dr.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↕		↕	↕	↕	↕↕	↕	↕	↕↕
Traffic Volume (vph)	8	0	100	0	32	8	1094	16	8	1199
Future Volume (vph)	8	0	100	0	32	8	1094	16	8	1199
Turn Type	Perm	NA	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4		8		5	2		1	6
Permitted Phases	4		8		8	2		2	6	
Detector Phase	4	4	8	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	21.6	21.6	21.6	9.6	23.2	23.2	9.6	33.2
Total Split (s)	21.6	21.6	21.6	21.6	21.6	9.6	33.8	33.8	9.6	33.8
Total Split (%)	33.2%	33.2%	33.2%	33.2%	33.2%	14.8%	52.0%	52.0%	14.8%	52.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		4.6	4.6	4.6	6.2	6.2	4.6	6.2
Lead/Lag						Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)		11.5		11.5	11.5	46.3	44.9	44.9	48.1	44.9
Actuated g/C Ratio		0.18		0.18	0.18	0.71	0.69	0.69	0.74	0.69
v/c Ratio		0.08		0.35	0.08	0.03	0.49	0.01	0.01	0.54
Control Delay		0.5		25.9	0.4	4.6	8.7	0.0	4.4	9.8
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		0.5		25.9	0.4	4.6	8.7	0.0	4.4	9.8
LOS		A		C	A	A	A	A	A	A
Approach Delay		0.5		19.6			8.5			9.7
Approach LOS		A		B			A			A

Intersection Summary

Cycle Length: 65
 Actuated Cycle Length: 65
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.54
 Intersection Signal Delay: 9.6
 Intersection LOS: A
 Intersection Capacity Utilization 61.6%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 11: Waterman Av. & Driveway 2/Park Center Dr.



HCM Signalized Intersection Capacity Analysis
 11: Waterman Av. & Driveway 2/Park Center Dr.

Gateway South Building 4 TIA (JN 10187)

3/27/2017
























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↕	↕	↕	↕↕	
Traffic Volume (vph)	8	0	20	100	0	32	8	1094	16	8	1199	2
Future Volume (vph)	8	0	20	100	0	32	8	1094	16	8	1199	2
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)		4.6			4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes		1.00			1.00	0.99	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.90			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.99			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1604			1800	1800	1615	3600	1800	1700	3600	
Flt Permitted		0.90			0.74	1.00	0.15	1.00	1.00	0.18	1.00	
Satd. Flow (perm)		1466			1800	1800	256	3600	1800	1700	3600	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	9	0	22	111	0	36	9	1216	18	9	1332	2
RTOR Reduction (vph)	0	26	0	0	0	31	0	0	7	0	0	0
Lane Group Flow (vph)	0	5	0	0	111	5	9	1216	11	9	1334	0
Confl. Peds. (#/hr)						1			1			1
Confl. Bikes (#/hr)									1			1
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		9.5			9.5	9.5	40.1	39.1	39.1	40.1	39.1	
Effective Green, g (s)		9.5			9.5	9.5	40.1	39.1	39.1	40.1	39.1	
Actuated g/C Ratio		0.15			0.15	0.15	0.62	0.60	0.60	0.62	0.60	
Clearance Time (s)		4.6			4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Vehicle Extension (s)		3.0			3.0	3.0	2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)		214			263	263	178	2165	1082	1169	2165	
v/s Ratio Prot							c0.00	0.34		0.00	c0.37	
v/s Ratio Perm		0.00			0.06	0.00	0.03		0.01	0.01		
v/c Ratio		0.02			0.42	0.02	0.05	0.56	0.01	0.01	0.62	
Uniform Delay, d1		23.8			25.3	23.8	5.6	7.8	5.2	5.3	8.2	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.0			1.1	0.0	0.0	1.1	0.0	0.0	1.3	
Delay (s)		23.8			26.3	23.8	5.7	8.9	5.2	5.3	9.5	
Level of Service		C			C	C	A	A	A	A	A	
Approach Delay (s)		23.8			25.7			8.8			9.5	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	10.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	15.4
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	0	20	100	0	32	8	1094	16	8	1199	2
Future Volume (veh/h)	8	0	20	100	0	32	8	1094	16	8	1199	2
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	9	0	10	111	0	23	9	1216	18	9	1332	2
Adj No. of Lanes	0	1	0	0	1	1	1	2	1	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	141	25	94	335	0	222	273	2074	908	298	2124	3
Arrive On Green	0.15	0.00	0.15	0.15	0.00	0.15	0.01	0.61	0.61	0.01	0.61	0.61
Sat Flow, veh/h	410	175	650	1541	0	1527	1619	3420	1497	1619	3504	5
Grp Volume(v), veh/h	19	0	0	111	0	23	9	1216	18	9	650	684
Grp Sat Flow(s),veh/h/ln	1236	0	0	1541	0	1527	1619	1710	1497	1619	1710	1799
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.8	0.1	14.1	0.3	0.1	15.7	15.7
Cycle Q Clear(g_c), s	3.9	0.0	0.0	3.9	0.0	0.8	0.1	14.1	0.3	0.1	15.7	15.7
Prop In Lane	0.47		0.53	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	261	0	0	335	0	222	273	2074	908	298	1037	1091
V/C Ratio(X)	0.07	0.00	0.00	0.33	0.00	0.10	0.03	0.59	0.02	0.03	0.63	0.63
Avail Cap(c_a), veh/h	432	0	0	501	0	399	379	2074	908	404	1037	1091
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.0	0.0	0.0	25.4	0.0	24.1	6.7	7.8	5.1	6.3	8.1	8.1
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.6	0.0	0.2	0.0	1.2	0.0	0.0	2.9	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	1.9	0.0	0.4	0.1	6.9	0.1	0.1	8.0	8.4
LnGrp Delay(d),s/veh	24.2	0.0	0.0	26.0	0.0	24.3	6.7	9.0	5.1	6.4	11.0	10.9
LnGrp LOS	C			C		C	A	A	A	A	B	B
Approach Vol, veh/h		19			134			1243			1343	
Approach Delay, s/veh		24.2			25.7			9.0			10.9	
Approach LOS		C			C			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.3	45.6		14.0	5.3	45.6		14.0				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.0	27.6		17.0	5.0	27.6		17.0				
Max Q Clear Time (g_c+I1), s	2.1	16.1		5.9	2.1	17.7		5.9				
Green Ext Time (p_c), s	0.0	10.6		0.5	0.0	9.2		0.5				
Intersection Summary												
HCM 2010 Ctrl Delay			10.8									
HCM 2010 LOS			B									

Timings
12: Waterman Av./Waterman Av. & Hospitality Ln.

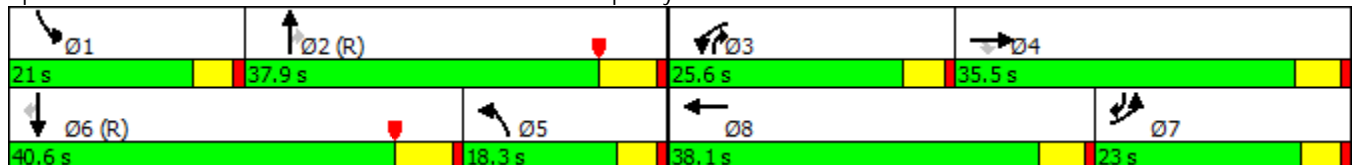


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↕	↗	↘↗	↕	↘↗	↕	↗↘	↘	↕↕↕	↗
Traffic Volume (vph)	168	383	554	390	450	265	449	687	200	970	149
Future Volume (vph)	168	383	554	390	450	265	449	687	200	970	149
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8	5	2	3	1	6	7
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	3	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	15.1	15.1	9.6	38.1	9.6	36.2	9.6	9.6	36.2	9.6
Total Split (s)	23.0	35.5	35.5	25.6	38.1	18.3	37.9	25.6	21.0	40.6	23.0
Total Split (%)	19.2%	29.6%	29.6%	21.3%	31.8%	15.3%	31.6%	21.3%	17.5%	33.8%	19.2%
Yellow Time (s)	3.6	4.1	4.1	3.6	4.1	3.6	5.2	3.6	3.6	5.2	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	5.1	4.6	5.1	4.6	6.2	4.6	4.6	6.2	4.6
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effect Green (s)	20.3	26.8	26.8	18.9	25.4	13.7	36.4	61.6	17.3	40.0	66.6
Actuated g/C Ratio	0.17	0.22	0.22	0.16	0.21	0.11	0.30	0.51	0.14	0.33	0.56
v/c Ratio	0.62	0.77	0.54	0.82	0.76	0.77	0.44	0.37	0.87	0.57	0.15
Control Delay	56.4	42.2	14.7	65.0	51.6	66.7	36.5	12.5	82.8	35.6	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.4	42.2	14.7	65.0	51.6	66.7	36.5	12.5	82.8	35.6	5.1
LOS	E	D	B	E	D	E	D	B	F	D	A
Approach Delay		37.0			57.1		30.4			39.3	
Approach LOS		D			E		C			D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 22 (18%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 105
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.87
 Intersection Signal Delay: 39.7
 Intersection LOS: D
 Intersection Capacity Utilization 85.1%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 12: Waterman Av./Waterman Av. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
 12: Waterman Av./Waterman Av. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕	↗	↖↗	↕		↖↗	↕	↗	↖	↕↖↗	↗
Traffic Volume (vph)	168	383	554	390	450	105	265	449	687	200	970	149
Future Volume (vph)	168	383	554	390	450	105	265	449	687	200	970	149
Ideal Flow (vphp)	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Lane Util. Factor	1.00	0.91	0.91	0.97	0.95		0.97	0.95	0.88	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.94	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Flt Permitted	1.00	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	179	407	589	415	479	112	282	478	731	213	1032	159
RTOR Reduction (vph)	0	87	177	0	18	0	0	0	127	0	0	58
Lane Group Flow (vph)	179	597	135	415	573	0	282	478	604	213	1032	101
Confl. Peds. (#/hr)						7			5			13
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4						2			6
Actuated Green, G (s)	20.3	26.8	26.8	18.9	25.4		13.7	36.5	55.4	17.3	40.1	60.4
Effective Green, g (s)	20.3	26.8	26.8	18.9	25.4		13.7	36.5	55.4	17.3	40.1	60.4
Actuated g/C Ratio	0.17	0.22	0.22	0.16	0.21		0.11	0.30	0.46	0.14	0.33	0.50
Clearance Time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	4.0	2.0	2.0	4.0	2.0
Lane Grp Cap (vph)	287	804	402	504	762		365	1095	1662	245	1804	975
v/s Ratio Prot	0.11	c0.17		0.13	c0.16		c0.09	0.13	0.06	c0.13	c0.19	0.02
v/s Ratio Perm			0.07						0.11			0.04
v/c Ratio	0.62	0.74	0.34	0.82	0.75		0.77	0.44	0.36	0.87	0.57	0.10
Uniform Delay, d1	46.3	43.4	39.1	48.9	44.3		51.6	33.5	20.9	50.2	32.9	15.6
Progression Factor	1.00	1.00	1.00	1.06	1.07		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.0	3.7	0.5	9.6	4.0		8.9	1.3	0.0	25.5	1.3	0.0
Delay (s)	49.3	47.1	39.6	61.3	51.6		60.6	34.8	20.9	75.8	34.2	15.6
Level of Service	D	D	D	E	D		E	C	C	E	C	B
Approach Delay (s)		45.5			55.6			32.9			38.4	
Approach LOS		D			E			C			D	

Intersection Summary		
HCM 2000 Control Delay	41.8	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.74	D
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	85.1%	20.5
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	168	383	554	390	450	105	265	449	687	200	970	149
Future Volume (veh/h)	168	383	554	390	450	105	265	449	687	200	970	149
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	179	373	481	415	479	97	282	478	365	213	1032	89
Adj No. of Lanes	1	1	2	2	2	0	2	2	2	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	282	415	706	463	592	119	420	1044	1237	221	1409	699
Arrive On Green	0.17	0.23	0.23	0.16	0.21	0.21	0.14	0.31	0.31	0.14	0.29	0.29
Sat Flow, veh/h	1619	1800	3060	2956	2832	570	2956	3420	2671	1619	4914	1509
Grp Volume(v), veh/h	179	373	481	415	288	288	282	478	365	213	1032	89
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	1710	1693	1478	1710	1335	1619	1638	1509
Q Serve(g_s), s	12.3	24.1	11.9	16.5	19.2	19.5	10.9	13.5	10.2	15.7	22.8	0.0
Cycle Q Clear(g_c), s	12.3	24.1	11.9	16.5	19.2	19.5	10.9	13.5	10.2	15.7	22.8	0.0
Prop In Lane	1.00		1.00	1.00		0.34	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	282	415	706	463	358	354	420	1044	1237	221	1409	699
V/C Ratio(X)	0.64	0.90	0.68	0.90	0.81	0.81	0.67	0.46	0.30	0.96	0.73	0.13
Avail Cap(c_a), veh/h	282	456	775	517	470	465	420	1044	1237	221	1409	699
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.88	0.88	0.88	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.0	44.8	20.2	49.7	45.1	45.2	48.8	33.7	20.1	51.5	38.6	18.5
Incr Delay (d2), s/veh	3.6	19.2	2.2	14.4	6.7	7.2	3.4	1.4	0.6	49.5	3.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.8	14.2	5.2	7.7	9.8	9.8	4.6	6.6	3.9	10.1	10.8	1.8
LnGrp Delay(d),s/veh	49.6	64.0	22.4	64.1	51.8	52.4	52.2	35.1	20.7	101.0	42.1	18.9
LnGrp LOS	D	E	C	E	D	D	D	D	C	F	D	B
Approach Vol, veh/h		1033			991			1125			1334	
Approach Delay, s/veh		42.2			57.1			34.7			49.9	
Approach LOS		D			E			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	21.0	42.8	23.4	32.8	23.2	40.6	26.0	30.2				
Change Period (Y+Rc), s	4.6	6.2	4.6	5.1	6.2	* 6.2	5.1	* 5.1				
Max Green Setting (Gmax), s	16.4	31.7	21.0	30.4	13.7	* 34	18.4	* 33				
Max Q Clear Time (g_c+I1), s	17.7	15.5	18.5	26.1	12.9	24.8	14.3	21.5				
Green Ext Time (p_c), s	0.0	5.9	0.2	1.6	0.1	5.7	1.8	2.6				
Intersection Summary												
HCM 2010 Ctrl Delay			45.9									
HCM 2010 LOS			D									
Notes												

Intersection

Int Delay, s/veh 1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↖ ↗	↖ ↗	↖ ↗	
Traffic Vol, veh/h	0	0	347	1424	1313	684
Future Vol, veh/h	0	0	347	1424	1313	684
Conflicting Peds, #/hr	0	0	0	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	0	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	377	1548	1427	743

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	717	1430 0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	7.1	5.3 -
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.9	3.1 -
Pot Cap-1 Maneuver	0	*615	*774 -
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	1	1 -
Mov Cap-1 Maneuver	-	*614	*774 -
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	2.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	* 774	-	-	-	-
HCM Lane V/C Ratio	0.487	-	-	-	-
HCM Control Delay (s)	14	-	0	-	-
HCM Lane LOS	B	-	A	-	-
HCM 95th %tile Q(veh)	2.7	-	-	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations						↗		↕			↕	
Traffic Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Future Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	-	-	-	Free	-	-	-	-	-	None
Storage Length	-	-	-	-	-	0	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	1197	0	988	0	0	739	169

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	0	0	0
Stage 1	0	0	0
Stage 2	0	0	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBTWBLn1	SBT	SBR
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	-	0	-
HCM Lane LOS	-	A	-
HCM 95th %tile Q(veh)	-	-	-

Intersection

Int Delay, s/veh

Movement	NWL	NWR
Lane Configurations		
Traffic Vol, veh/h	0	0
Future Vol, veh/h	0	0
Conflicting Peds, #/hr	0	0
Sign Control	Stop	Stop
RT Channelized	-	-
Storage Length	-	-
Veh in Median Storage, #	0	-
Grade, %	0	-
Peak Hour Factor	96	96
Heavy Vehicles, %	0	0
Mvmt Flow	0	0

Major/Minor

Conflicting Flow All

Stage 1

Stage 2

Critical Hdwy

Critical Hdwy Stg 1

Critical Hdwy Stg 2

Follow-up Hdwy

Pot Cap-1 Maneuver

Stage 1

Stage 2

Platoon blocked, %

Mov Cap-1 Maneuver

Mov Cap-2 Maneuver

Stage 1

Stage 2

Approach

HCM Control Delay, s

HCM LOS

Minor Lane/Major Mvmt

Timings

15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.

3/27/2017

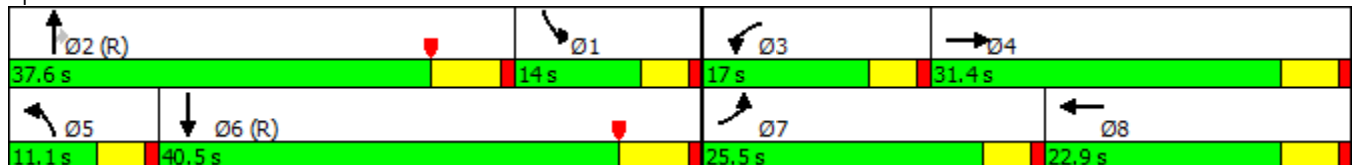


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖↖	↕↗	↖	↕↗	↖	↕↕	↗	↖	↕↗
Traffic Volume (vph)	483	654	169	353	51	884	83	201	519
Future Volume (vph)	483	654	169	353	51	884	83	201	519
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	9.6	31.4	9.6	15.4	9.6	36.2	36.2	9.6	36.2
Total Split (s)	25.5	31.4	17.0	22.9	11.1	37.6	37.6	14.0	40.5
Total Split (%)	25.5%	31.4%	17.0%	22.9%	11.1%	37.6%	37.6%	14.0%	40.5%
Yellow Time (s)	3.6	4.4	3.6	4.4	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	5.4	4.6	6.2	6.2	4.6	6.2
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)	19.1	25.5	12.0	18.4	6.2	32.2	32.2	9.4	37.4
Actuated g/C Ratio	0.19	0.26	0.12	0.18	0.06	0.32	0.32	0.09	0.37
v/c Ratio	0.84	0.91	0.88	0.78	0.52	0.81	0.12	1.35	0.54
Control Delay	52.1	49.3	83.0	42.2	63.1	38.0	0.4	228.4	25.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.1	49.3	83.0	42.2	63.1	38.0	0.4	228.4	25.4
LOS	D	D	F	D	E	D	A	F	C
Approach Delay		50.4		52.0		36.2			70.3
Approach LOS		D		D		D			E

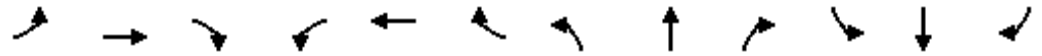
Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.35
 Intersection Signal Delay: 51.6
 Intersection LOS: D
 Intersection Capacity Utilization 90.0%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.

























HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↔		↔	↑↔		↔	↑↑	↔	↔	↑↔	
Traffic Volume (vph)	483	654	143	169	353	181	51	884	83	201	519	188
Future Volume (vph)	483	654	143	169	353	181	51	884	83	201	519	188
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.95		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	514	696	152	180	376	193	54	940	88	214	552	200
RTOR Reduction (vph)	0	19	0	0	64	0	0	0	60	0	36	0
Lane Group Flow (vph)	514	829	0	180	505	0	54	940	28	214	716	0
Confl. Peds. (#/hr)			3						1			6
Confl. Bikes (#/hr)			1						1			
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	19.1	25.5		12.0	18.4		5.2	31.3	31.3	10.4	36.5	
Effective Green, g (s)	19.1	25.5		12.0	18.4		5.2	31.3	31.3	10.4	36.5	
Actuated g/C Ratio	0.19	0.26		0.12	0.18		0.05	0.31	0.31	0.10	0.36	
Clearance Time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	611	918		204	662		88	1126	563	176	1314	
v/s Ratio Prot	c0.16	c0.23		0.11	0.14		0.03	c0.26		c0.13	0.20	
v/s Ratio Perm									0.02			
v/c Ratio	0.84	0.90		0.88	0.76		0.61	0.83	0.05	1.22	0.55	
Uniform Delay, d1	39.0	36.1		43.3	38.7		46.4	31.9	24.0	44.8	25.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	9.8	12.1		32.2	5.2		8.6	7.4	0.2	137.8	1.6	
Delay (s)	48.8	48.1		75.5	43.9		55.0	39.3	24.1	182.6	26.8	
Level of Service	D	D		E	D		E	D	C	F	C	
Approach Delay (s)		48.4			51.5			38.8			61.3	
Approach LOS		D			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	49.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.8
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	483	654	143	169	353	181	51	884	83	201	519	188
Future Volume (veh/h)	483	654	143	169	353	181	51	884	83	201	519	188
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	514	696	145	180	376	152	54	940	57	214	552	139
Adj No. of Lanes	2	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	569	731	152	201	457	182	67	1074	474	951	2373	595
Arrive On Green	0.19	0.26	0.26	0.12	0.19	0.19	0.04	0.31	0.31	0.59	0.88	0.88
Sat Flow, veh/h	2956	2810	585	1619	2389	952	1619	3420	1509	1619	2709	680
Grp Volume(v), veh/h	514	423	418	180	268	260	54	940	57	214	348	343
Grp Sat Flow(s),veh/h/ln	1478	1710	1685	1619	1710	1632	1619	1710	1509	1619	1710	1678
Q Serve(g_s), s	17.0	24.3	24.4	11.0	15.0	15.4	3.3	26.0	3.8	6.3	3.2	3.2
Cycle Q Clear(g_c), s	17.0	24.3	24.4	11.0	15.0	15.4	3.3	26.0	3.8	6.3	3.2	3.2
Prop In Lane	1.00		0.35	1.00		0.58	1.00		1.00	1.00		0.40
Lane Grp Cap(c), veh/h	569	445	438	201	327	312	67	1074	474	951	1498	1471
V/C Ratio(X)	0.90	0.95	0.95	0.90	0.82	0.83	0.81	0.88	0.12	0.23	0.23	0.23
Avail Cap(c_a), veh/h	618	445	438	201	327	312	105	1074	474	951	1498	1471
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.87	0.87	0.87	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.5	36.4	36.4	43.2	38.8	38.9	47.5	32.4	48.2	9.8	1.0	1.0
Incr Delay (d2), s/veh	13.6	28.2	28.7	35.6	14.9	17.3	10.6	10.0	0.5	0.0	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.0	15.0	14.9	6.9	8.4	8.4	1.7	13.8	1.6	2.8	1.6	1.6
LnGrp Delay(d),s/veh	53.0	64.6	65.1	78.8	53.6	56.2	58.1	42.4	48.8	9.9	1.3	1.3
LnGrp LOS	D	E	E	E	D	E	E	D	D	A	A	A
Approach Vol, veh/h		1355			708			1051			905	
Approach Delay, s/veh		60.3			61.0			43.6			3.3	
Approach LOS		E			E			D			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	65.5	37.6	17.0	31.4	8.7	94.4	23.9	24.5				
Change Period (Y+Rc), s	6.2	* 6.2	4.6	5.4	4.6	6.2	4.6	5.4				
Max Green Setting (Gmax), s	9.4	* 31	12.4	26.0	6.5	34.3	20.9	17.5				
Max Q Clear Time (g_c+I1), s	8.3	28.0	13.0	26.4	5.3	5.2	19.0	17.4				
Green Ext Time (p_c), s	0.1	2.2	0.0	0.0	0.0	6.0	0.3	0.1				
Intersection Summary												
HCM 2010 Ctrl Delay			43.2									
HCM 2010 LOS			D									
Notes												

Timings
16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

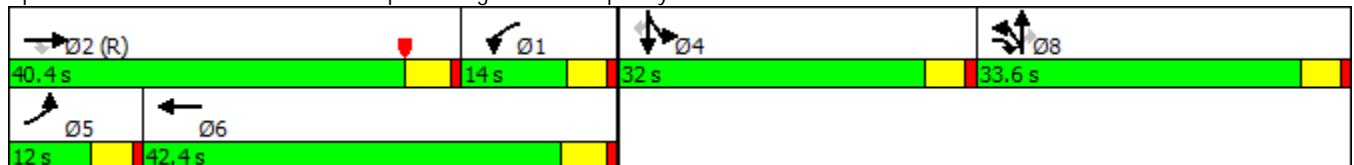


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	58	403	117	229	211	165	602	245	45	721	264
Future Volume (vph)	58	403	117	229	211	165	602	245	45	721	264
Turn Type	Prot	NA	pm+ov	Prot	NA	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	8	8		4	4	
Permitted Phases			2					8			4
Detector Phase	5	2	8	1	6	8	8	8	4	4	4
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	39.1	33.6	9.6	39.1	33.6	33.6	33.6	22.6	22.6	22.6
Total Split (s)	12.0	40.4	33.6	14.0	42.4	33.6	33.6	33.6	32.0	32.0	32.0
Total Split (%)	10.0%	33.7%	28.0%	11.7%	35.3%	28.0%	28.0%	28.0%	26.7%	26.7%	26.7%
Yellow Time (s)	3.6	4.1	3.6	3.6	4.1	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lead	Lead		Lag	Lag						
Lead-Lag Optimize?	Yes	Yes		Yes	Yes						
Recall Mode	None	C-Max	Max	None	None	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	7.0	35.3	69.4	9.4	39.7	29.0	29.0	29.0	27.4	27.4	27.4
Actuated g/C Ratio	0.06	0.29	0.58	0.08	0.33	0.24	0.24	0.24	0.23	0.23	0.23
v/c Ratio	0.65	0.42	0.12	1.01	0.46	0.40	0.78	0.45	0.13	0.96	0.55
Control Delay	89.6	36.1	8.1	114.1	13.0	41.7	49.8	12.2	38.0	69.8	23.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.6	36.1	8.1	114.1	13.0	41.7	49.8	12.2	38.0	69.8	23.8
LOS	F	D	A	F	B	D	D	B	D	E	C
Approach Delay		35.8			40.6		39.5			56.6	
Approach LOS		D			D		D			E	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT, Start of Yellow
 Natural Cycle: 115
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.01
 Intersection Signal Delay: 44.2
 Intersection LOS: D
 Intersection Capacity Utilization 97.0%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)
























4/6/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘↗	↑↑		↘	↕↑	↗	↘	↑↑	↗
Traffic Volume (vph)	58	403	117	229	211	399	165	602	245	45	721	264
Future Volume (vph)	58	403	117	229	211	399	165	602	245	45	721	264
Ideal Flow (vphpl)	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	4.6	4.6	5.1		4.6	4.6	4.6	4.6	4.6	4.6
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.91	0.91	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600		1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600		1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	64	443	129	252	232	438	181	662	269	49	792	290
RTOR Reduction (vph)	0	0	29	0	280	0	0	0	160	0	0	115
Lane Group Flow (vph)	64	443	100	252	390	0	163	680	109	49	792	175
Confl. Peds. (#/hr)			4			7			2			
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA	pm+ov	Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6		8	8		4	4	
Permitted Phases			2						8			4
Actuated Green, G (s)	5.9	34.4	63.4	10.3	38.8		29.0	29.0	29.0	27.4	27.4	27.4
Effective Green, g (s)	5.9	34.4	63.4	10.3	38.8		29.0	29.0	29.0	27.4	27.4	27.4
Actuated g/C Ratio	0.05	0.29	0.53	0.09	0.32		0.24	0.24	0.24	0.23	0.23	0.23
Clearance Time (s)	4.6	5.1	4.6	4.6	5.1		4.6	4.6	4.6	4.6	4.6	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	83	1032	1020	274	1164		410	870	435	388	822	411
v/s Ratio Prot	c0.04	c0.12	0.02	c0.08	0.11		0.10	c0.19		0.03	c0.22	
v/s Ratio Perm			0.03						0.06			0.10
v/c Ratio	0.77	0.43	0.10	0.92	0.33		0.40	0.78	0.25	0.13	0.96	0.43
Uniform Delay, d1	56.4	34.8	14.1	54.4	30.8		38.2	42.5	36.7	36.8	45.8	39.6
Progression Factor	1.17	1.02	1.28	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	28.3	1.1	0.2	33.0	0.2		2.9	6.9	1.4	0.7	23.7	3.2
Delay (s)	94.0	36.7	18.2	87.4	31.0		41.0	49.5	38.1	37.5	69.5	42.8
Level of Service	F	D	B	F	C		D	D	D	D	E	D
Approach Delay (s)		38.7			46.4			45.5			61.2	
Approach LOS		D			D			D			E	

Intersection Summary		
HCM 2000 Control Delay	49.3	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.74	
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	97.0%	ICU Level of Service
Analysis Period (min)	15	

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	403	117	229	211	399	165	602	245	45	721	264
Future Volume (veh/h)	58	403	117	229	211	399	165	602	245	45	721	264
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	64	443	86	252	232	411	181	662	234	49	792	253
Adj No. of Lanes	1	2	1	2	2	0	1	2	1	1	2	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	80	1006	818	638	795	699	391	870	369	370	781	349
Arrive On Green	0.02	0.10	0.10	0.22	0.46	0.46	0.24	0.24	0.24	0.23	0.23	0.23
Sat Flow, veh/h	1619	3420	1524	2956	1710	1504	1619	3600	1526	1619	3420	1530
Grp Volume(v), veh/h	64	443	86	252	232	411	181	662	234	49	792	253
Grp Sat Flow(s),veh/h/ln	1619	1710	1524	1478	1710	1504	1619	1800	1526	1619	1710	1530
Q Serve(g_s), s	4.7	14.7	4.1	8.8	10.1	24.2	11.5	20.5	16.5	2.9	27.4	18.3
Cycle Q Clear(g_c), s	4.7	14.7	4.1	8.8	10.1	24.2	11.5	20.5	16.5	2.9	27.4	18.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	80	1006	818	638	795	699	391	870	369	370	781	349
V/C Ratio(X)	0.80	0.44	0.11	0.39	0.29	0.59	0.46	0.76	0.63	0.13	1.01	0.72
Avail Cap(c_a), veh/h	100	1006	818	638	795	699	391	870	369	370	781	349
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.76	0.76	0.76	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.4	44.9	17.8	40.3	19.9	23.7	38.8	42.3	40.8	36.8	46.3	42.8
Incr Delay (d2), s/veh	19.2	1.1	0.2	0.1	0.2	1.3	3.9	6.2	8.1	0.7	35.8	12.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	7.1	2.7	3.6	4.8	10.3	5.6	11.0	7.8	1.4	16.8	9.0
LnGrp Delay(d),s/veh	77.6	45.9	18.0	40.5	20.1	24.9	42.7	48.5	48.8	37.6	82.1	55.1
LnGrp LOS	E	D	B	D	C	C	D	D	D	D	F	E
Approach Vol, veh/h		593			895			1077			1094	
Approach Delay, s/veh		45.3			28.1			47.6			73.9	
Approach LOS		D			C			D			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	31.5	40.4		32.0	10.5	61.4		33.6				
Change Period (Y+Rc), s	5.1	* 5.1		4.6	4.6	5.1		4.6				
Max Green Setting (Gmax), s	9.4	* 35		27.4	7.4	37.3		29.0				
Max Q Clear Time (g_c+I1), s	10.8	16.7		29.4	6.7	26.2		22.5				
Green Ext Time (p_c), s	0.0	2.9		0.0	0.0	3.5		2.9				
Intersection Summary												
HCM 2010 Ctrl Delay			50.3									
HCM 2010 LOS			D									
Notes												

APPENDIX 3.3:

EXISTING (2017) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-3. Warrant 3, Peak Hour

Traffic Conditions = Existing (2017) Conditions - Weekday PM Peak Hour

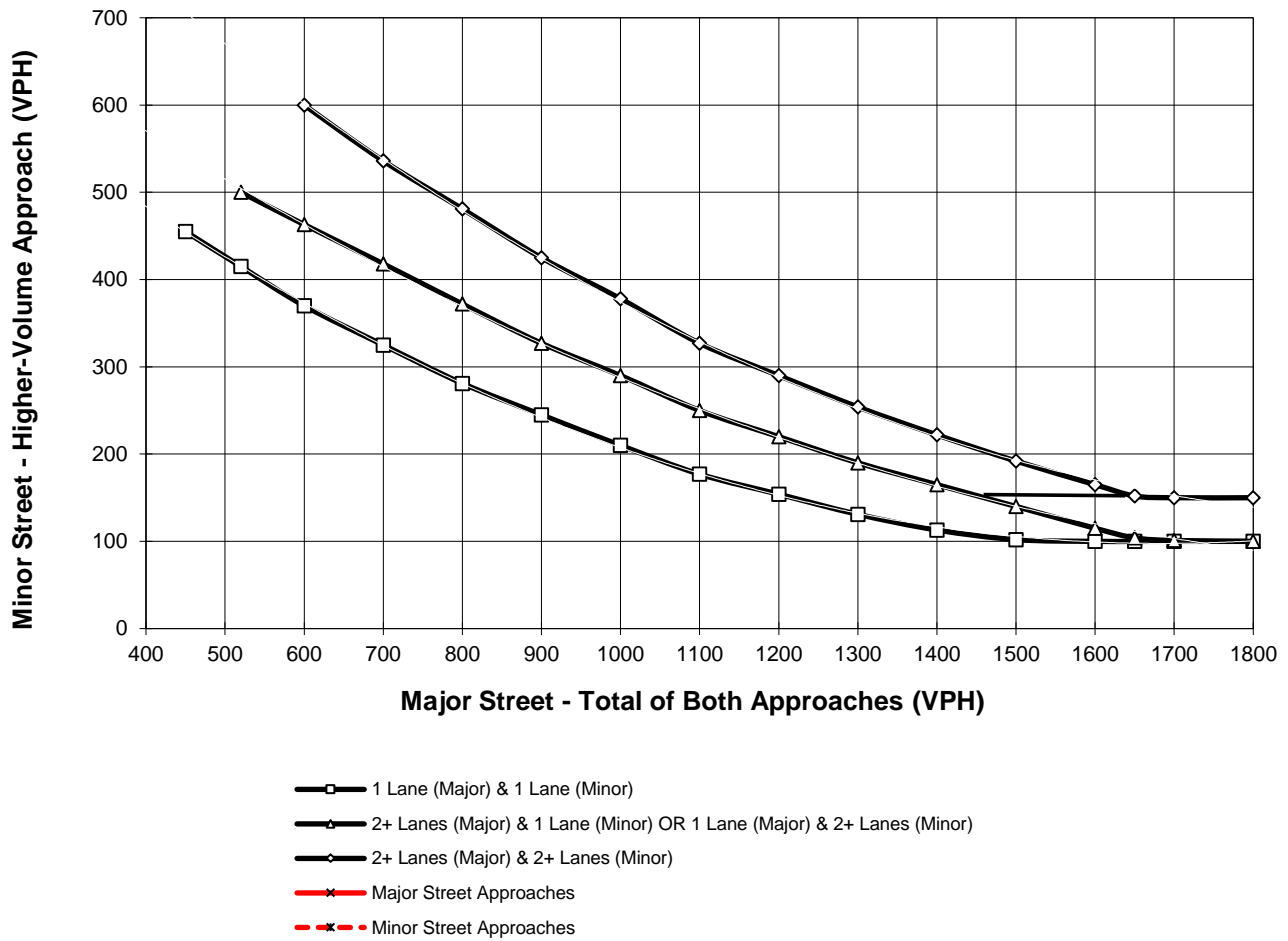
Major Street Name = Dumas St.

Total of Both Approaches (VPH) = 17
 Number of Approach Lanes on Major Street = 1

Minor Street Name = Washington Av.

High Volume Approach (VPH) = 15
 Number of Approach Lanes On Minor Street = 1

SIGNAL WARRANT NOT SATISFIED



*Note: 150 vph applies as the lower threshold for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **Existing (2017) Conditions - Weekday AM Peak Hour**

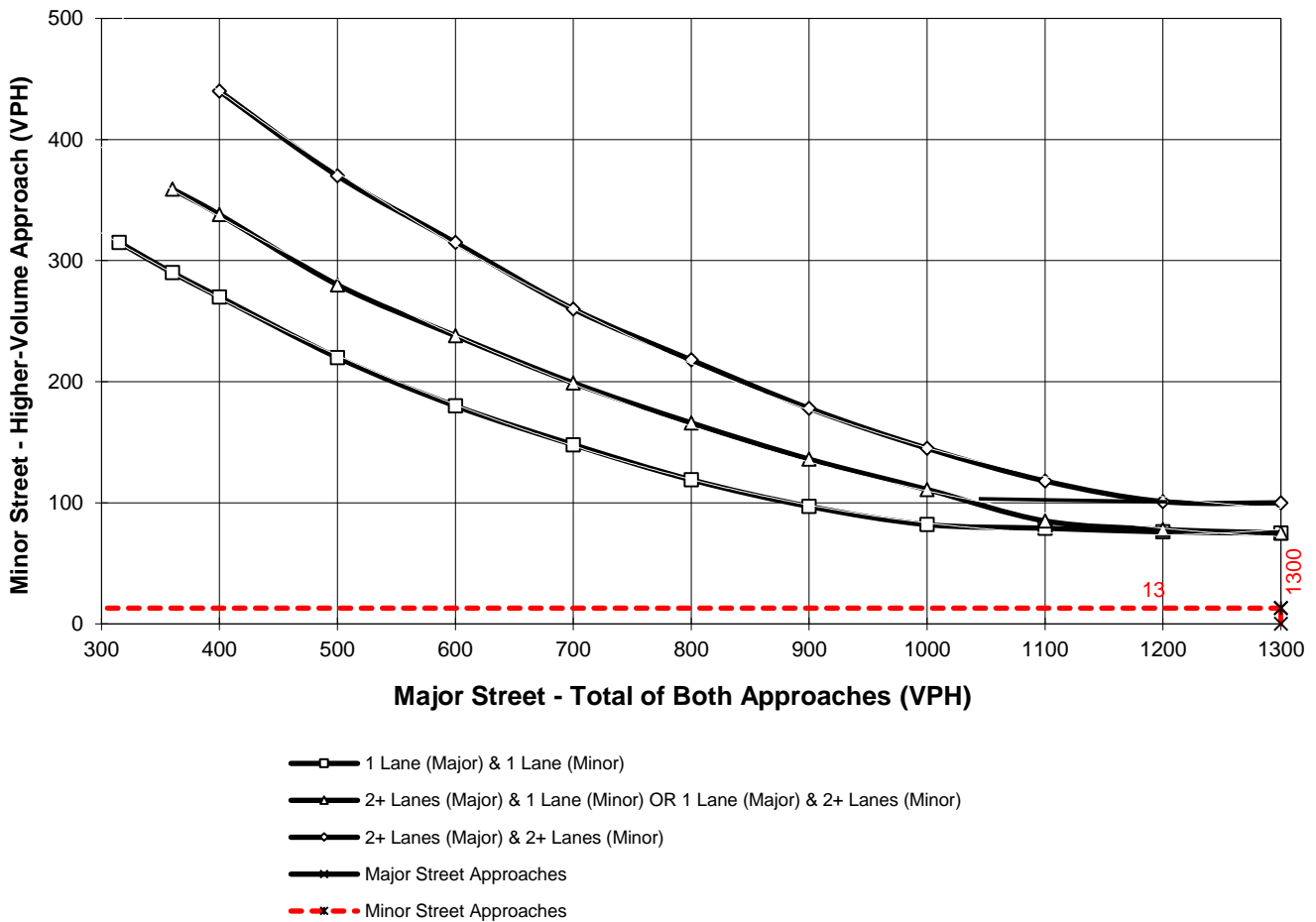
Major Street Name = **Waterman Av.**

Total of Both Approaches (VPH) = **1613**
 Number of Approach Lanes Major Street = **2**

Minor Street Name = **Dumas St.**

High Volume Approach (VPH) = **13**
 Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

APPENDIX 3.4:

EXISTING (2017) CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS

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Queues

1: I-215 SB Ramps & Auto Center Rd.



Lane Group	EBT	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	175	201	585	588	366
v/c Ratio	0.12	0.13	0.83	0.78	0.38
Control Delay	8.8	10.6	28.3	24.8	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	8.8	10.6	28.3	24.8	2.8
Queue Length 50th (ft)	15	27	189	185	0
Queue Length 95th (ft)	31	40	#368	#353	41
Internal Link Dist (ft)	663	209		2403	
Turn Bay Length (ft)					465
Base Capacity (vph)	1520	1500	708	750	963
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.12	0.13	0.83	0.78	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Queues

2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.

3/24/2017



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	76	1209	325	274	82	81	923
v/c Ratio	0.45	0.59	0.19	0.28	0.18	0.17	0.89
Control Delay	27.5	8.6	12.1	8.1	18.3	18.1	31.2
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	10.7
Total Delay	27.5	8.9	12.1	8.1	18.3	18.1	41.9
Queue Length 50th (ft)	16	221	61	45	24	23	160
Queue Length 95th (ft)	m28	m294	m104	m130	54	54	#273
Internal Link Dist (ft)		295	473			974	
Turn Bay Length (ft)	270			230	315		275
Base Capacity (vph)	178	2040	1687	989	453	480	1041
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	276	0	0	0	0	111
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.69	0.19	0.28	0.18	0.17	0.99

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.



Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	523	38	447	25	472	488	668
v/c Ratio	0.54	0.38	0.37	0.08	0.52	0.51	0.61
Control Delay	41.0	64.2	31.6	0.5	21.4	21.0	13.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.0	64.2	31.6	0.5	21.4	21.0	13.0
Queue Length 50th (ft)	190	29	138	0	255	262	198
Queue Length 95th (ft)	256	65	184	0	364	368	323
Internal Link Dist (ft)	873		790			811	
Turn Bay Length (ft)		150			100		215
Base Capacity (vph)	970	136	1200	321	909	964	1103
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.28	0.37	0.08	0.52	0.51	0.61

Intersection Summary

Queues

16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

3/24/2017



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	82	179	55	43	695	301	667	186	8	373	82
v/c Ratio	0.27	0.13	0.05	0.25	0.59	0.67	0.70	0.31	0.03	0.63	0.19
Control Delay	41.8	23.8	1.1	53.0	16.8	44.8	41.3	8.1	39.1	48.4	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.8	23.8	1.1	53.0	16.8	44.8	41.3	8.1	39.1	48.4	1.0
Queue Length 50th (ft)	46	45	0	15	95	209	234	10	5	131	0
Queue Length 95th (ft)	107	73	8	34	130	317	303	65	20	182	0
Internal Link Dist (ft)		1015			1164		440			335	
Turn Bay Length (ft)	85		270	250		800		160	110		110
Base Capacity (vph)	318	1373	1220	212	1506	448	949	597	278	589	430
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.13	0.05	0.20	0.46	0.67	0.70	0.31	0.03	0.63	0.19

Intersection Summary

Queues

1: I-215 SB Ramps & Auto Center Rd.



Lane Group	EBT	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	637	339	340	342	279
v/c Ratio	0.40	0.22	0.49	0.46	0.31
Control Delay	10.4	6.3	16.0	15.5	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.4	6.3	16.0	15.5	2.8
Queue Length 50th (ft)	63	21	91	90	0
Queue Length 95th (ft)	98	26	160	156	37
Internal Link Dist (ft)	663	209		2403	
Turn Bay Length (ft)					465
Base Capacity (vph)	1594	1524	697	738	902
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.40	0.22	0.49	0.46	0.31

Intersection Summary



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	227	786	844	647	63	62	923
v/c Ratio	1.28	0.39	0.58	0.58	0.14	0.13	0.78
Control Delay	184.5	4.8	11.4	3.7	17.8	17.7	18.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Total Delay	184.5	4.8	11.4	3.7	17.8	17.7	19.1
Queue Length 50th (ft)	~98	24	111	38	17	17	114
Queue Length 95th (ft)	#220	47	m172	m93	45	44	182
Internal Link Dist (ft)		295	473			974	
Turn Bay Length (ft)	270			230	315		275
Base Capacity (vph)	178	2040	1452	1112	453	480	1187
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	165	0	0	0	0	34
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.28	0.42	0.58	0.58	0.14	0.13	0.80

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Queues

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.



Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	698	23	608	67	334	337	408
v/c Ratio	0.49	0.28	0.38	0.27	0.49	0.46	0.44
Control Delay	29.8	63.8	23.0	2.6	30.3	29.6	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	63.8	23.0	2.6	30.3	29.6	5.9
Queue Length 50th (ft)	224	18	161	0	205	205	26
Queue Length 95th (ft)	286	46	208	0	302	297	96
Internal Link Dist (ft)	873		790			811	
Turn Bay Length (ft)		150			100		215
Base Capacity (vph)	1413	90	1608	333	685	726	937
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.26	0.38	0.20	0.49	0.46	0.44

Intersection Summary

Queues
16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	64	443	129	252	670	163	680	269	49	792	290
v/c Ratio	0.65	0.42	0.12	1.01	0.46	0.40	0.78	0.45	0.13	0.96	0.55
Control Delay	89.6	36.1	8.1	114.1	13.0	41.7	49.8	12.2	38.0	69.8	23.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.6	36.1	8.1	114.1	13.0	41.7	49.8	12.2	38.0	69.8	23.8
Queue Length 50th (ft)	52	134	0	~103	77	117	271	35	30	321	94
Queue Length 95th (ft)	m#88	m173	m62	#191	133	190	346	111	65	#449	185
Internal Link Dist (ft)		1015			1164		440			335	
Turn Bay Length (ft)	85		270	250		800		160	110		110
Base Capacity (vph)	104	1059	1066	250	1468	410	870	595	388	822	525
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.42	0.12	1.01	0.46	0.40	0.78	0.45	0.13	0.96	0.55

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

APPENDIX 3.5:

EXISTING (2017) CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS

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BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Northbound
Agency or Company	Urban Crossroads, Inc.	From/To	North of Auto Center
Date Performed	3/9/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2017)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	5326	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			3
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain: Level
			Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.985
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
1469	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	69.2	x f _p)	
S	mph	S	mph
D = v _p / S	21.2	D = v _p / S	pc/mi/ln
21.2	pc/mi/ln	Required Number of Lanes, N	
LOS	C		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Northbound
Agency or Company	Urban Crossroads, Inc.	From/To	South of Auto Center
Date Performed	3/9/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2017)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
Flow Inputs			
Volume, V	6934	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			2
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1903	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	64.3	x f _p)	
D = v _p / S	29.6	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Southbound
Agency or Company	Urban Crossroads, Inc.	From/To	North of Auto Center
Date Performed	3/9/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2017)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6628	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			4
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain: Level
			Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1470	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	69.2	x f _p)	
D = v _p / S	21.3	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Southbound
Agency or Company	Urban Crossroads, Inc.	From/To	South of Auto Center
Date Performed	3/9/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2017)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	6585	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			4
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1460	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	69.2	x f _p)	
D = v _p / S	21.1	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Eastbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	3/9/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2017)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	7224	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			10
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.952
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
x f _p)	2061	v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	61.4	x f _p)	pc/h/ln
D = v _p / S	33.6	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Eastbound
Agency or Company	Urban Crossroads, Inc.	From/To	East of Waterman
Date Performed	3/9/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2017)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	6517	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			11
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.948
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
1495	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	69.0	x f _p)	
S	mph	S	mph
D = v _p / S	21.7	D = v _p / S	pc/mi/ln
21.7	pc/mi/ln	Required Number of Lanes, N	
LOS	C		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Westbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	3/9/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2017)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	7808	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			15
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.930
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	2281	Design LOS	
S	56.4	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	40.4	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Westbound
Agency or Company	Urban Crossroads, Inc.	From/To	East of Waterman
Date Performed	3/9/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2017)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	8451	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			14
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.935
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	2457	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	51.7	x f _p)	
D = v _p / S	47.6	S	mph
LOS	F	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Northbound
Agency or Company	Urban Crossroads, Inc.	From/To	North of Auto Center
Date Performed	3/9/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2017)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	6523	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			1
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain: Level
			Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.995
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)		Design LOS	
S	66.1	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	27.0	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Northbound
Agency or Company	Urban Crossroads, Inc.	From/To	South of Auto Center
Date Performed	3/9/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2017)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
Flow Inputs			
Volume, V	7535	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			2
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain: Level
			Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2068	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	61.3	x f _p)	
S	mph	S	mph
D = v _p / S	33.8	D = v _p / S	pc/mi/ln
33.8	pc/mi/ln	Required Number of Lanes, N	
LOS	D		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Southbound
Agency or Company	Urban Crossroads, Inc.	From/To	North of Auto Center
Date Performed	3/9/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2017)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	5471	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 2
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	1201	Design LOS	
S	70.0	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	17.2	S	mph
LOS	B	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Southbound
Agency or Company	Urban Crossroads, Inc.	From/To	South of Auto Center
Date Performed	3/9/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2017)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8167	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			2
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1793	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	65.9	x f _p)	
D = v _p / S	27.2	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Eastbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	3/9/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2017)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6350	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			8
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.962
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1795	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	65.9	x f _p)	
D = v _p / S	27.2	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Eastbound
Agency or Company	Urban Crossroads, Inc.	From/To	East of Waterman
Date Performed	3/9/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2017)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6526	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			8
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.962
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1475	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	69.1	x f _p)	
D = v _p / S	21.3	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Westbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	3/9/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2017)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	7764	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			17
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.922
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	2289	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	56.2	x f _p)	
D = v _p / S	40.7	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Westbound
Agency or Company	Urban Crossroads, Inc.	From/To	East of Waterman
Date Performed	3/9/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2017)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	7016	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			18
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.917
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
x f _p)	2078	v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	61.1	x f _p)	pc/h/ln
D = v _p / S	34.0	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

APPENDIX 3.6:

EXISTING (2017) CONDITIONS RAMP JUNCTION ANALYSIS WORKSHEETS

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RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound						
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Auto Center						
Date Performed	3/9/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2017)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp						
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On						
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	240	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off						
L _{up} = 1840 ft	Deceleration Lane Length L _D		L _{down} = ft						
V _u = 946 veh/h	Freeway Volume, V _F	5062	V _D = veh/h						
	Ramp Volume, V _R	264							
	Freeway Free-Flow Speed, S _{FF}	65.0							
	Ramp Free-Flow Speed, S _{FR}	45.0							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5062	0.92	Level	2	0	0.990	1.00	5557	
Ramp	264	0.92	Level	19	0	0.913	1.00	314	
UpStream	946	0.92	Level	2	0	0.990	1.00	1039	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.179 using Equation (Exhibit 13-6) V ₁₂ = 992 pc/h V ₃ or V _{av34} = 2282 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2222 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity	LOS F?			Actual	Capacity	LOS F?	
V _{FO}	5871	Exhibit 13-8	No		V _F	Exhibit 13-8			
					V _{FO} = V _F - V _R	Exhibit 13-8			
					V _R	Exhibit 13-10			
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}	2536	Exhibit 13-8	4600:All		No	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 23.6 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = 0.349 (Exhibit 13-11)					D _s = (Exhibit 13-12)				
S _R = 57.0 mph (Exhibit 13-11)					S _R = mph (Exhibit 13-12)				
S ₀ = 60.8 mph (Exhibit 13-11)					S ₀ = mph (Exhibit 13-12)				
S = 59.1 mph (Exhibit 13-13)					S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound							
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center							
Date Performed	3/9/2017	Jurisdiction	Caltrans							
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2017)							
Project Description Gateway South Building 4 TIA (JN 10187)										
Inputs										
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N Ramp Number of Lanes, N Acceleration Lane Length, L _A Deceleration Lane Length L _D Freeway Volume, V _F Ramp Volume, V _R Freeway Free-Flow Speed, S _{FF} Ramp Free-Flow Speed, S _{FR}	4 2 975 6008 926 65.0 45.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off	L _{down} = 1260 ft V _D = 946 veh/h						
L _{up} = ft										
V _u = veh/h										
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	6008	0.92	Level	2	0	0.990	1.00	6596		
Ramp	926	0.92	Level	5	0	0.976	1.00	1032		
UpStream										
DownStream	946	0.92	Level	2	0	0.990	1.00	1039		
Merge Areas					Diverge Areas					
Estimation of v ₁₂					Estimation of v ₁₂					
L _{EQ} =	V ₁₂ = V _F (P _{FM})	(Equation 13-6 or 13-7)			L _{EQ} =	V ₁₂ = V _R + (V _F - V _R)P _{FD}	(Equation 13-12 or 13-13)			
P _{FM} =	using Equation (Exhibit 13-6)				P _{FD} =	0.260 using Equation (Exhibit 13-7)				
V ₁₂ =	pc/h				V ₁₂ =	2479 pc/h				
V ₃ or V _{av34}	pc/h (Equation 13-14 or 13-17)				V ₃ or V _{av34}	2058 pc/h (Equation 13-14 or 13-17)				
Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, V _{12a} =	pc/h (Equation 13-16, 13-18, or 13-19)				If Yes, V _{12a} =	2638 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 13-8			V _F	6596	Exhibit 13-8		9400	No
					V _{FO} = V _F - V _R	5564	Exhibit 13-8		9400	No
					V _R	1032	Exhibit 13-10		4200	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	2479	Exhibit 13-8		4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
D _R =	5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A				D _R =	4.252 + 0.0086 V ₁₂ - 0.009 L _D				
D _R =	(pc/mi/ln)				D _R =	7.9 (pc/mi/ln)				
LOS =	(Exhibit 13-2)				LOS =	A (Exhibit 13-2)				
Speed Determination					Speed Determination					
M _S =	(Exhibit 13-11)				D _S =	0.391 (Exhibit 13-12)				
S _R =	mph (Exhibit 13-11)				S _R =	56.0 mph (Exhibit 13-12)				
S ₀ =	mph (Exhibit 13-11)				S ₀ =	67.5 mph (Exhibit 13-12)				
S =	mph (Exhibit 13-13)				S =	62.4 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center						
Date Performed	3/9/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2017)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	5	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	Freeway Volume, V _F	5229	L _{down} =	1790 ft	Freeway Free-Flow Speed, S _{FF}	65.0
L _{up} =	Ramp Number of Lanes, N	1	V _D =	Ramp Volume, V _R	1399			Ramp Free-Flow Speed, S _{FR}	45.0
V _u =	Acceleration Lane Length, L _A			Deceleration Lane Length L _D	180				
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5229	0.92	Level	4	0	0.980	1.00	5797	
Ramp	1399	0.92	Level	2	0	0.990	1.00	1536	
UpStream									
DownStream	688	0.92	Level	6	0	0.971	1.00	770	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 3015 pc/h V ₃ or V _{av34} 956 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	4928	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	3392	Exhibit 13-8	9400	No
					V _R	1536	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	3015	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 28.6 (pc/mi/ln) LOS = D (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S =	(Exhibit 13-11)				D _S =	0.436 (Exhibit 13-12)			
S _R =	mph (Exhibit 13-11)				S _R =	55.0 mph (Exhibit 13-12)			
S ₀ =	mph (Exhibit 13-11)				S ₀ =	71.3 mph (Exhibit 13-12)			
S =	mph (Exhibit 13-13)				S =	60.3 mph (Exhibit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information				Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Upstream)						
Date Performed	3/9/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2017)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N		4		Downstream Adj Ramp				
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N		1		<input type="checkbox"/> Yes <input type="checkbox"/> On				
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A		200		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off				
L _{up} = 1070 ft	Deceleration Lane Length L _D				L _{down} = ft				
V _u = 688 veh/h	Freeway Volume, V _F		5917		V _D = veh/h				
	Ramp Volume, V _R		204						
	Freeway Free-Flow Speed, S _{FF}		65.0						
	Ramp Free-Flow Speed, S _{FR}		45.0						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5917	0.92	Level	4	0	0.980	1.00	6560	
Ramp	204	0.92	Level	16	0	0.926	1.00	239	
UpStream	688	0.92	Level	6	0	0.971	1.00	770	
DownStream									
Merge Areas				Diverge Areas					
Estimation of v ₁₂				Estimation of v ₁₂					
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.188 using Equation (Exhibit 13-6) V ₁₂ = 1233 pc/h V ₃ or V _{av34} = 2663 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2624 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks				Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	6799	Exhibit 13-8		No		V _F	Exhibit 13-8		
						V _{FO} = V _F - V _R	Exhibit 13-8		
						V _R	Exhibit 13-10		
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	2863	Exhibit 13-8		4600:All	No	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)				Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 26.4 (pc/mi/ln) LOS = C (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					
Speed Determination				Speed Determination					
M _S = 0.371 (Exhibit 13-11) S _R = 56.5 mph (Exhibit 13-11) S ₀ = 59.7 mph (Exhibit 13-11) S = 58.3 mph (Exhibit 13-13)				D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information				Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Downstream)						
Date Performed	3/9/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2017)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N	5				Downstream Adj Ramp			
	Ramp Number of Lanes, N	1				<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On			
	Acceleration Lane Length, L _A	200				<input type="checkbox"/> No <input type="checkbox"/> Off			
	Deceleration Lane Length L _D					L _{down} = 1115 ft			
	Freeway Volume, V _F	6495				V _D = 90 veh/h			
	Ramp Volume, V _R	204							
	Freeway Free-Flow Speed, S _{FF}	65.0							
Ramp Free-Flow Speed, S _{FR}	45.0								
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6495	0.92	Level	4	0	0.980	1.00	7201	
Ramp	204	0.92	Level	16	0	0.926	1.00	239	
UpStream									
DownStream	90	0.92	Level	6	0	0.971	1.00	101	
Merge Areas				Diverge Areas					
Estimation of v ₁₂				Estimation of v ₁₂					
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.188 using Equation (Exhibit 13-6) V ₁₂ = 988 pc/h V ₃ or V _{av34} = 2134 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2102 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks				Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	5496	Exhibit 13-8		No	V _F		Exhibit 13-8		
					V _{FO} = V _F - V _R		Exhibit 13-8		
					V _R		Exhibit 13-10		
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	2341	Exhibit 13-8	4600:All	No	V ₁₂		Exhibit 13-8		
Level of Service Determination (if not F)				Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 22.4 (pc/mi/ln) LOS = C (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					
Speed Determination				Speed Determination					
M _S =	0.344 (Exhibit 13-11)			D _s =	(Exhibit 13-12)				
S _R =	57.1 mph (Exhibit 13-11)			S _R =	mph (Exhibit 13-12)				
S ₀ =	61.1 mph (Exhibit 13-11)			S ₀ =	mph (Exhibit 13-12)				
S =	59.3 mph (Exhibit 13-13)			S =	mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Eastbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Waterman						
Date Performed	3/9/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2017)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N Ramp Number of Lanes, N Acceleration Lane Length, L _A Deceleration Lane Length L _D Freeway Volume, V _F Ramp Volume, V _R Freeway Free-Flow Speed, S _{FF} Ramp Free-Flow Speed, S _{FR}	4 1 1500 6126 1098 65.0 45.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 2950 ft V _D = 391 veh/h						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6126	0.92	Level	11	0	0.948	1.00	7025	
Ramp	1098	0.92	Level	2	0	0.990	1.00	1205	
UpStream									
DownStream	391	0.92	Level	6	0	0.971	1.00	438	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 3743 pc/h V ₃ or V _{av34} 1641 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	7025	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	5820	Exhibit 13-8	9400	No
					V _R	1205	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	3743	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 22.9 (pc/mi/ln) LOS = C (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11)					D _S = 0.406 (Exhibit 13-12)				
S _R = mph (Exhibit 13-11)					S _R = 55.7 mph (Exhibit 13-12)				
S ₀ = mph (Exhibit 13-11)					S ₀ = 68.8 mph (Exhibit 13-12)				
S = mph (Exhibit 13-13)					S = 61.1 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Eastbound						
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman						
Date Performed	3/9/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2017)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp						
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On						
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	1500	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off						
L _{up} = 2950 ft	Deceleration Lane Length L _D		L _{down} = ft						
V _u = 1098 veh/h	Freeway Volume, V _F	6126	V _D = veh/h						
	Ramp Volume, V _R	391							
	Freeway Free-Flow Speed, S _{FF}	65.0							
	Ramp Free-Flow Speed, S _{FR}	45.0							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6126	0.92	Level	11	0	0.948	1.00	7025	
Ramp	391	0.92	Level	6	0	0.971	1.00	438	
UpStream	1098	0.92	Level	3	0	0.985	1.00	1211	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.163 using Equation (Exhibit 13-6) V ₁₂ = 1145 pc/h V ₃ or V _{av34} = 2940 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2810 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity	LOS F?			Actual	Capacity	LOS F?	
V _{FO}	7463	Exhibit 13-8	No		V _F	Exhibit 13-8			
					V _{FO} = V _F - V _R	Exhibit 13-8			
					V _R	Exhibit 13-10			
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}	3248	Exhibit 13-8	4600:All		No	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 21.2 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = 0.286 (Exhibit 13-11)					D _s = (Exhibit 13-12)				
S _R = 58.4 mph (Exhibit 13-11)					S _R = mph (Exhibit 13-12)				
S ₀ = 59.2 mph (Exhibit 13-11)					S ₀ = mph (Exhibit 13-12)				
S = 58.9 mph (Exhibit 13-13)					S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET								
General Information				Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Westbound					
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman					
Date Performed	3/9/2017	Jurisdiction	Caltrans					
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2017)					
Project Description Gateway South Building 4 TIA (JN 10187)								
Inputs								
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp					
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On					
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	1500	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off					
L _{up} = 1815 ft	Deceleration Lane Length L _D		L _{down} = ft					
V _u = 891 veh/h	Freeway Volume, V _F	7560	V _D = veh/h					
	Ramp Volume, V _R	248						
	Freeway Free-Flow Speed, S _{FF}	65.0						
	Ramp Free-Flow Speed, S _{FR}	45.0						
Conversion to pc/h Under Base Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	7560	0.92	Level	15	0	0.930	1.00	8834
Ramp	248	0.92	Level	8	0	0.962	1.00	280
UpStream	891	0.92	Level	2	0	0.990	1.00	978
DownStream								
Merge Areas				Diverge Areas				
Estimation of v ₁₂				Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.183 using Equation (Exhibit 13-6) V ₁₂ = 1615 pc/h V ₃ or V _{av34} = 3609 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 3533 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}	9114	Exhibit 13-8	No	V _F		Exhibit 13-8		
				V _{FO} = V _F - V _R		Exhibit 13-8		
				V _R		Exhibit 13-10		
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}	3813	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)				Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 25.7 (pc/mi/ln) LOS = C (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination				Speed Determination				
M _S = 0.363 (Exhibit 13-11)				D _s = (Exhibit 13-12)				
S _R = 56.7 mph (Exhibit 13-11)				S _R = mph (Exhibit 13-12)				
S ₀ = 56.4 mph (Exhibit 13-11)				S ₀ = mph (Exhibit 13-12)				
S = 56.5 mph (Exhibit 13-13)				S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Westbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Waterman						
Date Performed	3/9/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	Existing (2017)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N				4	Downstream Adj Ramp			
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N				1	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On			
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A					<input type="checkbox"/> No <input type="checkbox"/> Off			
L _{up} = ft	Deceleration Lane Length L _D				1500	L _{down} = 1815 ft			
V _u = veh/h	Freeway Volume, V _F				7560	V _D = 248 veh/h			
	Ramp Volume, V _R				891				
	Freeway Free-Flow Speed, S _{FF}				65.0				
	Ramp Free-Flow Speed, S _{FR}				45.0				
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	7560	0.92	Level	15	0	0.930	1.00	8834	
Ramp	891	0.92	Level	2	0	0.990	1.00	978	
UpStream									
DownStream	248	0.92	Level	8	0	0.962	1.00	280	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 4403 pc/h V ₃ or V _{av34} 2215 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	8834	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	7856	Exhibit 13-8	9400	No
					V _R	978	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	4403	Exhibit 13-8	4400:All	Yes
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 28.6 (pc/mi/ln) LOS = D (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S =	(Exhibit 13-11)				D _S =	0.386 (Exhibit 13-12)			
S _R =	mph (Exhibit 13-11)				S _R =	56.1 mph (Exhibit 13-12)			
S ₀ =	mph (Exhibit 13-11)				S ₀ =	66.6 mph (Exhibit 13-12)			
S =	mph (Exhibit 13-13)				S =	60.9 mph (Exhibit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET								
General Information				Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound					
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Auto Center					
Date Performed	3/9/2017	Jurisdiction	Caltrans					
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2017)					
Project Description Gateway South Building 4 TIA (JN 10187)								
Inputs								
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp					
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On					
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	240	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off					
L _{up} = 1840 ft	Deceleration Lane Length L _D		L _{down} = ft					
V _u = 898 veh/h	Freeway Volume, V _F	5685	V _D = veh/h					
	Ramp Volume, V _R	838						
	Freeway Free-Flow Speed, S _{FF}	65.0						
	Ramp Free-Flow Speed, S _{FR}	45.0						
Conversion to pc/h Under Base Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	5685	0.92	Level	1	0	0.995	1.00	6210
Ramp	838	0.92	Level	2	0	0.990	1.00	920
UpStream	898	0.92	Level	2	0	0.990	1.00	986
DownStream								
Merge Areas				Diverge Areas				
Estimation of v ₁₂				Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.103 using Equation (Exhibit 13-6) V ₁₂ = 638 pc/h V ₃ or V _{av34} = 2786 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2484 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?	Actual	Capacity	LOS F?		
V _{FO}	7130	Exhibit 13-8	No	V _F	Exhibit 13-8			
				V _{FO} = V _F - V _R	Exhibit 13-8			
				V _R	Exhibit 13-10			
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?	Actual	Max Desirable	Violation?		
V _{R12}	3404	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)				Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 30.1 (pc/mi/ln) LOS = D (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination				Speed Determination				
M _S = 0.417 (Exhibit 13-11)				D _s = (Exhibit 13-12)				
S _R = 55.4 mph (Exhibit 13-11)				S _R = mph (Exhibit 13-12)				
S ₀ = 60.1 mph (Exhibit 13-11)				S ₀ = mph (Exhibit 13-12)				
S = 57.8 mph (Exhibit 13-13)				S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound							
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center							
Date Performed	3/9/2017	Jurisdiction	Caltrans							
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2017)							
Project Description Gateway South Building 4 TIA (JN 10187)										
Inputs										
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	4	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Freeway Volume, V _F	6583	L _{down} =	1260 ft	Freeway Free-Flow Speed, S _{FF}	65.0	
L _{up} =	Ramp Number of Lanes, N	2	V _D =	Ramp Volume, V _R	952			Ramp Free-Flow Speed, S _{FR}	45.0	
V _u =	Acceleration Lane Length, L _A			Freeway Free-Flow Speed, S _{FF}	65.0					
	Deceleration Lane Length L _D	975		Ramp Free-Flow Speed, S _{FR}	45.0					
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	6583	0.92	Level	1	0	0.995	1.00	7191		
Ramp	952	0.92	Level	5	0	0.976	1.00	1061		
UpStream										
DownStream	898	0.92	Level	2	0	0.990	1.00	986		
Merge Areas					Diverge Areas					
Estimation of v ₁₂					Estimation of v ₁₂					
L _{EQ} =	V ₁₂ = V _F (P _{FM}) (Equation 13-6 or 13-7)				L _{EQ} =	V ₁₂ = V _R + (V _F - V _R)P _{FD} (Equation 13-12 or 13-13)				
P _{FM} =	using Equation (Exhibit 13-6)				P _{FD} =	0.260 using Equation (Exhibit 13-7)				
V ₁₂ =	pc/h				V ₁₂ =	2655 pc/h				
V ₃ or V _{av34}	pc/h (Equation 13-14 or 13-17)				V ₃ or V _{av34}	2268 pc/h (Equation 13-14 or 13-17)				
Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, V _{12a} =	pc/h (Equation 13-16, 13-18, or 13-19)				If Yes, V _{12a} =	2876 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 13-8			V _F	7191	Exhibit 13-8		9400	No
					V _{FO} = V _F - V _R	6130	Exhibit 13-8		9400	No
					V _R	1061	Exhibit 13-10		4200	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	2655	Exhibit 13-8		4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
D _R =	5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A				D _R =	4.252 + 0.0086 V ₁₂ - 0.009 L _D				
D _R =	(pc/mi/ln)				D _R =	9.9 (pc/mi/ln)				
LOS =	(Exhibit 13-2)				LOS =	A (Exhibit 13-2)				
Speed Determination					Speed Determination					
M _S =	(Exhibit 13-11)				D _S =	0.393 (Exhibit 13-12)				
S _R =	mph (Exhibit 13-11)				S _R =	55.9 mph (Exhibit 13-12)				
S ₀ =	mph (Exhibit 13-11)				S ₀ =	66.8 mph (Exhibit 13-12)				
S =	mph (Exhibit 13-13)				S =	62.0 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center						
Date Performed	3/9/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2017)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	5	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	Freeway Volume, V _F	4613	L _{down} =	1790 ft	Freeway Free-Flow Speed, S _{FF}	65.0
L _{up} =	Ramp Number of Lanes, N	1	V _D =	Ramp Volume, V _R	858			Ramp Free-Flow Speed, S _{FR}	45.0
V _u =	Acceleration Lane Length, L _A			Freeway Free-Flow Speed, S _{FF}	65.0				
	Deceleration Lane Length L _D	180		Ramp Free-Flow Speed, S _{FR}	45.0				
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	4613	0.92	Level	1	0	0.995	1.00	5039	
Ramp	858	0.92	Level	6	0	0.971	1.00	961	
UpStream									
DownStream	1048	0.92	Level	3	0	0.985	1.00	1156	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 2520 pc/h V ₃ or V _{av34} 1008 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	4536	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	3575	Exhibit 13-8	9400	No
					V _R	961	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	2520	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 24.3 (pc/mi/ln) LOS = C (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S =	(Exhibit 13-11)				D _S =	0.384 (Exhibit 13-12)			
S _R =	mph (Exhibit 13-11)				S _R =	56.2 mph (Exhibit 13-12)			
S ₀ =	mph (Exhibit 13-11)				S ₀ =	71.3 mph (Exhibit 13-12)			
S =	mph (Exhibit 13-13)				S =	62.0 mph (Exhibit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Upstream)						
Date Performed	3/9/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2017)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N = 4				Downstream Adj Ramp				
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N = 1				<input type="checkbox"/> Yes <input type="checkbox"/> On				
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A = 200				<input checked="" type="checkbox"/> No <input type="checkbox"/> Off				
L _{up} = 1070 ft	Deceleration Lane Length L _D				L _{down} = ft				
V _u = 1048 veh/h	Freeway Volume, V _F = 5661				V _D = veh/h				
	Ramp Volume, V _R = 581								
	Freeway Free-Flow Speed, S _{FF} = 65.0								
	Ramp Free-Flow Speed, S _{FR} = 45.0								
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5661	0.92	Level	2	0	0.990	1.00	6215	
Ramp	581	0.92	Level	4	0	0.980	1.00	644	
UpStream	1048	0.92	Level	3	0	0.985	1.00	1156	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.137 using Equation (Exhibit 13-6) V ₁₂ = 853 pc/h V ₃ or V _{av34} = 2681 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2486 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	6859	Exhibit 13-8		No	V _F		Exhibit 13-8		
					V _{FO} = V _F - V _R		Exhibit 13-8		
					V _R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	3130	Exhibit 13-8	4600:All	No	V ₁₂		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 28.3 (pc/mi/ln) LOS = D (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = 0.392 (Exhibit 13-11)					D _s = (Exhibit 13-12)				
S _R = 56.0 mph (Exhibit 13-11)					S _R = mph (Exhibit 13-12)				
S ₀ = 60.1 mph (Exhibit 13-11)					S ₀ = mph (Exhibit 13-12)				
S = 58.1 mph (Exhibit 13-13)					S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information				Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Downstream)						
Date Performed	3/9/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2017)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N Ramp Number of Lanes, N Acceleration Lane Length, L _A Deceleration Lane Length L _D	5 1 200	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	L _{up} = ft	Freeway Volume, V _F Ramp Volume, V _R Freeway Free-Flow Speed, S _{FF} Ramp Free-Flow Speed, S _{FR}	7905 581 65.0 45.0	L _{down} = 1115 ft	V _D = 262 veh/h	
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	7905	0.92	Level	2	0	0.990	1.00	8678	
Ramp	581	0.92	Level	4	0	0.980	1.00	644	
UpStream									
DownStream	262	0.92	Level	5	0	0.976	1.00	292	
Merge Areas				Diverge Areas					
Estimation of v ₁₂				Estimation of v ₁₂					
L _{EQ} =	V ₁₂ = V _F (P _{FM}) (Equation 13-6 or 13-7)				L _{EQ} =	V ₁₂ = V _R + (V _F - V _R)P _{FD} (Equation 13-12 or 13-13)			
P _{FM} =	0.137 using Equation (Exhibit 13-6)				P _{FD} =	using Equation (Exhibit 13-7)			
V ₁₂ =	848 pc/h				V ₁₂ =	pc/h			
V ₃ or V _{av34}	2665 pc/h (Equation 13-14 or 13-17)				V ₃ or V _{av34}	pc/h (Equation 13-14 or 13-17)			
Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No			
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input type="checkbox"/> Yes <input type="checkbox"/> No			
If Yes, V _{12a} =	2471 pc/h (Equation 13-16, 13-18, or 13-19)				If Yes, V _{12a} =	pc/h (Equation 13-16, 13-18, or 13-19)			
Capacity Checks				Capacity Checks					
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?		
V _{FO}	6822	Exhibit 13-8	No	V _F		Exhibit 13-8			
				V _{FO} = V _F - V _R		Exhibit 13-8			
				V _R		Exhibit 13-10			
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area					
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?		
V _{R12}	3115	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8			
Level of Service Determination (if not F)				Level of Service Determination (if not F)					
D _R =	5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A			D _R =	4.252 + 0.0086 V ₁₂ - 0.009 L _D				
D _R =	28.2 (pc/mi/ln)			D _R =	(pc/mi/ln)				
LOS =	D (Exhibit 13-2)			LOS =	(Exhibit 13-2)				
Speed Determination				Speed Determination					
M _S =	0.391 (Exhibit 13-11)			D _s =	(Exhibit 13-12)				
S _R =	56.0 mph (Exhibit 13-11)			S _R =	mph (Exhibit 13-12)				
S ₀ =	60.1 mph (Exhibit 13-11)			S ₀ =	mph (Exhibit 13-12)				
S =	58.2 mph (Exhibit 13-13)			S =	mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Eastbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Waterman						
Date Performed	3/9/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2017)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N				4	Downstream Adj Ramp			
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N				1	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On			
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A					<input type="checkbox"/> No <input type="checkbox"/> Off			
L _{up} = ft	Deceleration Lane Length L _D				1500	L _{down} = 2950 ft			
V _u = veh/h	Freeway Volume, V _F				5704	V _D = 822 veh/h			
	Ramp Volume, V _R				646				
	Freeway Free-Flow Speed, S _{FF}				65.0				
	Ramp Free-Flow Speed, S _{FR}				45.0				
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5704	0.92	Level	8	0	0.962	1.00	6448	
Ramp	646	0.92	Level	3	0	0.985	1.00	713	
UpStream									
DownStream	822	0.92	Level	3	0	0.985	1.00	907	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 3213 pc/h V ₃ or V _{av34} 1617 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	6448	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	5735	Exhibit 13-8	9400	No
					V _R	713	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	3213	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 18.4 (pc/mi/ln) LOS = B (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S =	(Exhibit 13-11)				D _S =	0.362 (Exhibit 13-12)			
S _R =	mph (Exhibit 13-11)				S _R =	56.7 mph (Exhibit 13-12)			
S ₀ =	mph (Exhibit 13-11)				S ₀ =	68.9 mph (Exhibit 13-12)			
S =	mph (Exhibit 13-13)				S =	62.2 mph (Exhibit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET								
General Information				Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Eastbound					
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman					
Date Performed	3/9/2017	Jurisdiction	Caltrans					
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2017)					
Project Description Gateway South Building 4 TIA (JN 10187)								
Inputs								
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp					
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On					
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	1500	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off					
L _{up} = 2950 ft	Deceleration Lane Length L _D		L _{down} = ft					
V _u = 646 veh/h	Freeway Volume, V _F	5704	V _D = veh/h					
	Ramp Volume, V _R	822						
	Freeway Free-Flow Speed, S _{FF}	65.0						
	Ramp Free-Flow Speed, S _{FR}	45.0						
Conversion to pc/h Under Base Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	5704	0.92	Level	8	0	0.962	1.00	6448
Ramp	822	0.92	Level	3	0	0.985	1.00	907
UpStream	646	0.92	Level	3	0	0.985	1.00	713
DownStream								
Merge Areas				Diverge Areas				
Estimation of v ₁₂				Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.104 using Equation (Exhibit 13-6) V ₁₂ = 673 pc/h V ₃ or V _{av34} = 2887 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2579 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}	7355	Exhibit 13-8	No	V _F		Exhibit 13-8		
				V _{FO} = V _F - V _R		Exhibit 13-8		
				V _R		Exhibit 13-10		
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}	3486	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)				Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 22.8 (pc/mi/ln) LOS = C (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination				Speed Determination				
M _S = 0.313 (Exhibit 13-11)				D _s = (Exhibit 13-12)				
S _R = 57.8 mph (Exhibit 13-11)				S _R = mph (Exhibit 13-12)				
S ₀ = 59.8 mph (Exhibit 13-11)				S ₀ = mph (Exhibit 13-12)				
S = 58.9 mph (Exhibit 13-13)				S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Westbound						
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman						
Date Performed	3/9/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2017)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp						
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On						
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	1500	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off						
L _{up} = 1815 ft	Deceleration Lane Length L _D		L _{down} = ft						
V _u = 458 veh/h	Freeway Volume, V _F	6558	V _D = veh/h						
	Ramp Volume, V _R	1206							
	Freeway Free-Flow Speed, S _{FF}	65.0							
	Ramp Free-Flow Speed, S _{FR}	45.0							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6558	0.92	Level	20	0	0.909	1.00	7841	
Ramp	1206	0.92	Level	1	0	0.995	1.00	1317	
UpStream	458	0.92	Level	2	0	0.990	1.00	503	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.053 using Equation (Exhibit 13-6) V ₁₂ = 417 pc/h V ₃ or V _{av34} = 3712 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 3136 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity	LOS F?			Actual	Capacity	LOS F?	
V _{FO}	9158	Exhibit 13-8	No		V _F	Exhibit 13-8			
					V _{FO} = V _F - V _R	Exhibit 13-8			
					V _R	Exhibit 13-10			
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}	4453	Exhibit 13-8	4600:All		No	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 30.2 (pc/mi/ln) LOS = D (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = 0.521 (Exhibit 13-11)					D _s = (Exhibit 13-12)				
S _R = 53.0 mph (Exhibit 13-11)					S _R = mph (Exhibit 13-12)				
S ₀ = 58.2 mph (Exhibit 13-11)					S ₀ = mph (Exhibit 13-12)				
S = 55.5 mph (Exhibit 13-13)					S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst	BA	Freeway/Dir of Travel	I-10 Westbound							
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Waterman							
Date Performed	3/9/2017	Jurisdiction	Caltrans							
Analysis Time Period	PM Peak Hour	Analysis Year	Existing (2017)							
Project Description Gateway South Building 4 TIA (JN 10187)										
Inputs										
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N Ramp Number of Lanes, N Acceleration Lane Length, L _A Deceleration Lane Length L _D Freeway Volume, V _F Ramp Volume, V _R Freeway Free-Flow Speed, S _{FF} Ramp Free-Flow Speed, S _{FR}	4 1 1500 6558 458 65.0 45.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off				L _{down} = 1815 ft V _D = 1206 veh/h			
L _{up} = ft										
V _u = veh/h										
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	6558	0.92	Level	20	0	0.909	1.00	7841		
Ramp	458	0.92	Level	2	0	0.990	1.00	503		
UpStream										
DownStream	1206	0.92	Level	1	0	0.995	1.00	1317		
Merge Areas					Diverge Areas					
Estimation of v ₁₂					Estimation of v ₁₂					
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 3702 pc/h V ₃ or V _{av34} 2069 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 13-8			V _F	7841	Exhibit 13-8	9400	No	
					V _{FO} = V _F - V _R	7338	Exhibit 13-8	9400	No	
					V _R	503	Exhibit 13-10	2100	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	3702	Exhibit 13-8	4400:All	No	
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 22.6 (pc/mi/ln) LOS = C (Exhibit 13-2)					
Speed Determination					Speed Determination					
M _S = (Exhibit 13-11)					D _S = 0.343 (Exhibit 13-12)					
S _R = mph (Exhibit 13-11)					S _R = 57.1 mph (Exhibit 13-12)					
S ₀ = mph (Exhibit 13-11)					S ₀ = 67.1 mph (Exhibit 13-12)					
S = mph (Exhibit 13-13)					S = 62.0 mph (Exhibit 13-13)					

APPENDIX 3.7:

**EXISTING (2017) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS
WITH IMPROVEMENTS**

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Timings
16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

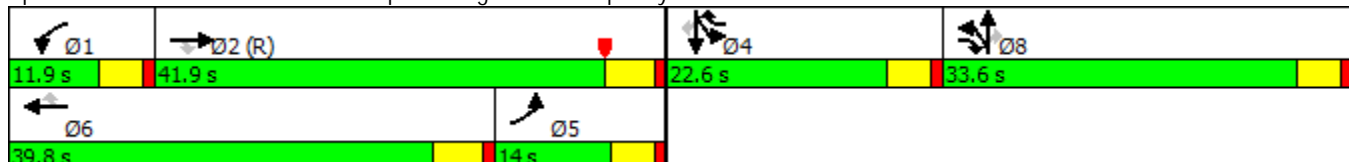


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘↗	↑↑	↗	↘	↑↑	↗	↘	↑↑	↗
Traffic Volume (vph)	80	175	54	42	101	580	328	620	182	8	366	80
Future Volume (vph)	80	175	54	42	101	580	328	620	182	8	366	80
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	8	1	6	4	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	39.1	33.6	9.6	39.1	22.6	33.6	33.6	33.6	22.6	22.6	22.6
Total Split (s)	14.0	41.9	33.6	11.9	39.8	22.6	33.6	33.6	33.6	22.6	22.6	22.6
Total Split (%)	12.7%	38.1%	30.5%	10.8%	36.2%	20.5%	30.5%	30.5%	30.5%	20.5%	20.5%	20.5%
Yellow Time (s)	3.6	4.1	3.6	3.6	4.1	3.6	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	C-Max	Max	None	None	Max	Max	Max	Max	Max	Max	Max
Act Effect Green (s)	23.4	42.0	73.3	6.0	22.7	41.2	29.0	29.0	29.0	18.0	18.0	18.0
Actuated g/C Ratio	0.21	0.38	0.67	0.05	0.21	0.37	0.26	0.26	0.26	0.16	0.16	0.16
v/c Ratio	0.23	0.13	0.05	0.25	0.41	0.51	0.67	0.70	0.31	0.03	0.63	0.19
Control Delay	38.1	23.8	1.1	53.0	12.1	12.6	44.8	41.3	8.1	39.1	48.4	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.1	23.8	1.1	53.0	12.1	12.6	44.8	41.3	8.1	39.1	48.4	1.0
LOS	D	C	A	D	B	B	D	D	A	D	D	A
Approach Delay		23.6			14.7			36.9			39.8	
Approach LOS		C			B			D			D	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:EBT, Start of Yellow
 Natural Cycle: 105
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 29.7
 Intersection LOS: C
 Intersection Capacity Utilization 77.7%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)

4/6/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	175	54	42	101	580	328	620	182	8	366	80
Future Volume (vph)	80	175	54	42	101	580	328	620	182	8	366	80
Ideal Flow (vphpl)	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lane Util. Factor	1.00	0.95	1.00	0.97	0.91	0.91	0.91	0.91	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	0.99	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.89	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600	1383	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600	1383	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	82	179	55	43	103	592	335	633	186	8	373	82
RTOR Reduction (vph)	0	0	20	0	240	69	0	0	123	0	0	69
Lane Group Flow (vph)	82	179	35	43	159	227	301	667	63	8	373	13
Confl. Peds. (#/hr)			2			1						
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	23.3	40.1	69.1	4.0	20.8	38.8	29.0	29.0	29.0	18.0	18.0	18.0
Effective Green, g (s)	23.3	40.1	69.1	4.0	20.8	38.8	29.0	29.0	29.0	18.0	18.0	18.0
Actuated g/C Ratio	0.21	0.36	0.63	0.04	0.19	0.35	0.26	0.26	0.26	0.16	0.16	0.16
Clearance Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	360	1312	1130	116	680	487	448	949	474	278	589	294
v/s Ratio Prot	c0.05	0.05	0.01	0.01	0.04	c0.08	0.18	c0.19		0.00	c0.10	
v/s Ratio Perm			0.01			0.09			0.04			0.01
v/c Ratio	0.23	0.14	0.03	0.37	0.23	0.47	0.67	0.70	0.13	0.03	0.63	0.05
Uniform Delay, d1	35.9	23.4	7.8	51.8	37.8	27.6	36.2	36.6	30.9	38.7	42.9	38.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.2	0.1	0.7	0.2	0.7	7.8	4.3	0.6	0.2	5.1	0.3
Delay (s)	36.0	23.6	7.8	52.5	38.0	28.3	44.1	41.0	31.5	38.8	48.0	39.1
Level of Service	D	C	A	D	D	C	D	D	C	D	D	D
Approach Delay (s)		24.1			35.0			40.2			46.3	
Approach LOS		C			C			D			D	

Intersection Summary		
HCM 2000 Control Delay	37.9	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.51	D
Actuated Cycle Length (s)	110.0	Sum of lost time (s)
Intersection Capacity Utilization	77.7%	18.9
Analysis Period (min)	15	ICU Level of Service
		D

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	175	54	42	101	580	328	620	182	8	366	80
Future Volume (veh/h)	80	175	54	42	101	580	328	620	182	8	366	80
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	82	179	38	43	103	580	323	650	146	8	373	64
Adj No. of Lanes	1	2	1	2	1	2	1	2	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	321	1257	958	101	357	1106	427	949	403	265	560	250
Arrive On Green	0.20	0.37	0.37	0.03	0.20	0.20	0.26	0.26	0.26	0.16	0.16	0.16
Sat Flow, veh/h	1619	3420	1508	3048	1800	3052	1619	3600	1530	1619	3420	1530
Grp Volume(v), veh/h	82	179	38	43	103	580	323	650	146	8	373	64
Grp Sat Flow(s),veh/h/ln	1619	1710	1508	1524	1800	1526	1619	1800	1530	1619	1710	1530
Q Serve(g_s), s	4.7	3.8	1.0	1.5	5.4	16.5	20.2	17.8	8.5	0.5	11.3	4.0
Cycle Q Clear(g_c), s	4.7	3.8	1.0	1.5	5.4	16.5	20.2	17.8	8.5	0.5	11.3	4.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	321	1257	958	101	357	1106	427	949	403	265	560	250
V/C Ratio(X)	0.26	0.14	0.04	0.42	0.29	0.52	0.76	0.68	0.36	0.03	0.67	0.26
Avail Cap(c_a), veh/h	321	1257	958	202	568	1464	427	949	403	265	560	250
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.3	23.2	7.7	52.1	37.5	27.6	37.3	36.4	33.0	38.7	43.2	40.2
Incr Delay (d2), s/veh	0.1	0.2	0.1	1.0	0.4	0.4	11.8	4.0	2.5	0.2	6.2	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	1.9	0.8	0.7	2.7	8.8	10.4	9.4	3.9	0.2	5.8	1.9
LnGrp Delay(d),s/veh	37.4	23.4	7.7	53.2	37.9	28.0	49.1	40.4	35.5	38.9	49.4	42.6
LnGrp LOS	D	C	A	D	D	C	D	D	D	D	D	D
Approach Vol, veh/h		299			726			1119			445	
Approach Delay, s/veh		25.3			30.9			42.3			48.2	
Approach LOS		C			C			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.3	45.5		22.6	26.9	26.9		33.6				
Change Period (Y+Rc), s	4.6	5.1		4.6	5.1	* 5.1		4.6				
Max Green Setting (Gmax), s	7.3	36.8		18.0	9.4	* 35		29.0				
Max Q Clear Time (g_c+I1), s	3.5	5.8		13.3	6.7	18.5		22.2				
Green Ext Time (p_c), s	0.0	1.3		1.2	0.3	2.8		3.1				
Intersection Summary												
HCM 2010 Ctrl Delay			38.1									
HCM 2010 LOS			D									
Notes												

Timings
16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

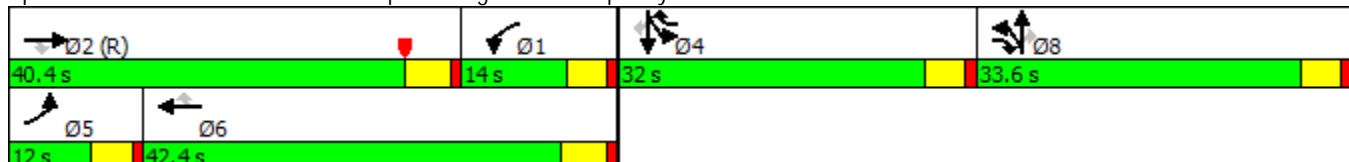


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	403	117	229	211	399	165	602	245	45	721	264
Future Volume (vph)	58	403	117	229	211	399	165	602	245	45	721	264
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	8	1	6	4	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	39.1	33.6	9.6	39.1	22.6	33.6	33.6	33.6	22.6	22.6	22.6
Total Split (s)	12.0	40.4	33.6	14.0	42.4	32.0	33.6	33.6	33.6	32.0	32.0	32.0
Total Split (%)	10.0%	33.7%	28.0%	11.7%	35.3%	26.7%	28.0%	28.0%	28.0%	26.7%	26.7%	26.7%
Yellow Time (s)	3.6	4.1	3.6	3.6	4.1	3.6	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lead	Lead		Lag	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	C-Max	Max	None	None	Max	Max	Max	Max	Max	Max	Max
Act Effect Green (s)	7.0	35.3	69.4	9.4	39.7	67.6	29.0	29.0	29.0	27.4	27.4	27.4
Actuated g/C Ratio	0.06	0.29	0.58	0.08	0.33	0.56	0.24	0.24	0.24	0.23	0.23	0.23
v/c Ratio	0.65	0.42	0.12	1.01	0.34	0.27	0.40	0.78	0.45	0.13	0.96	0.55
Control Delay	89.6	36.1	8.1	114.1	17.2	8.6	41.7	49.8	12.2	38.0	69.8	23.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.6	36.1	8.1	114.1	17.2	8.6	41.7	49.8	12.2	38.0	69.8	23.8
LOS	F	D	A	F	B	A	D	D	B	D	E	C
Approach Delay		35.8			41.6			39.5			56.6	
Approach LOS		D			D			D			E	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT, Start of Yellow
 Natural Cycle: 115
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.01
 Intersection Signal Delay: 44.5
 Intersection LOS: D
 Intersection Capacity Utilization 97.0%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)

























4/6/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	403	117	229	211	399	165	602	245	45	721	264
Future Volume (vph)	58	403	117	229	211	399	165	602	245	45	721	264
Ideal Flow (vphpl)	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lane Util. Factor	1.00	0.95	1.00	0.97	0.91	0.91	0.91	0.91	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	0.99	0.99	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600	1376	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600	1376	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	64	443	129	252	232	438	181	662	269	49	792	290
RTOR Reduction (vph)	0	0	29	0	140	35	0	0	160	0	0	115
Lane Group Flow (vph)	64	443	100	252	311	184	163	680	109	49	792	175
Confl. Peds. (#/hr)			4			7			2			
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	5.9	34.4	63.4	10.3	38.8	66.2	29.0	29.0	29.0	27.4	27.4	27.4
Effective Green, g (s)	5.9	34.4	63.4	10.3	38.8	66.2	29.0	29.0	29.0	27.4	27.4	27.4
Actuated g/C Ratio	0.05	0.29	0.53	0.09	0.32	0.55	0.24	0.24	0.24	0.23	0.23	0.23
Clearance Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	83	1032	1020	274	1164	759	410	870	435	388	822	411
v/s Ratio Prot	c0.04	c0.12	0.02	c0.08	0.09	0.06	0.10	c0.19		0.03	c0.22	
v/s Ratio Perm			0.03			0.08			0.06			0.10
v/c Ratio	0.77	0.43	0.10	0.92	0.27	0.24	0.40	0.78	0.25	0.13	0.96	0.43
Uniform Delay, d1	56.4	34.8	14.1	54.4	30.1	13.9	38.2	42.5	36.7	36.8	45.8	39.6
Progression Factor	1.17	1.02	1.28	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	28.3	1.1	0.2	33.0	0.1	0.2	2.9	6.9	1.4	0.7	23.7	3.2
Delay (s)	94.0	36.7	18.2	87.4	30.2	14.1	41.0	49.5	38.1	37.5	69.5	42.8
Level of Service	F	D	B	F	C	B	D	D	D	D	E	D
Approach Delay (s)		38.7			42.0			45.5			61.2	
Approach LOS		D			D			D			E	

Intersection Summary		
HCM 2000 Control Delay	48.2	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.74	D
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	97.0%	18.9
Analysis Period (min)	15	ICU Level of Service
		F

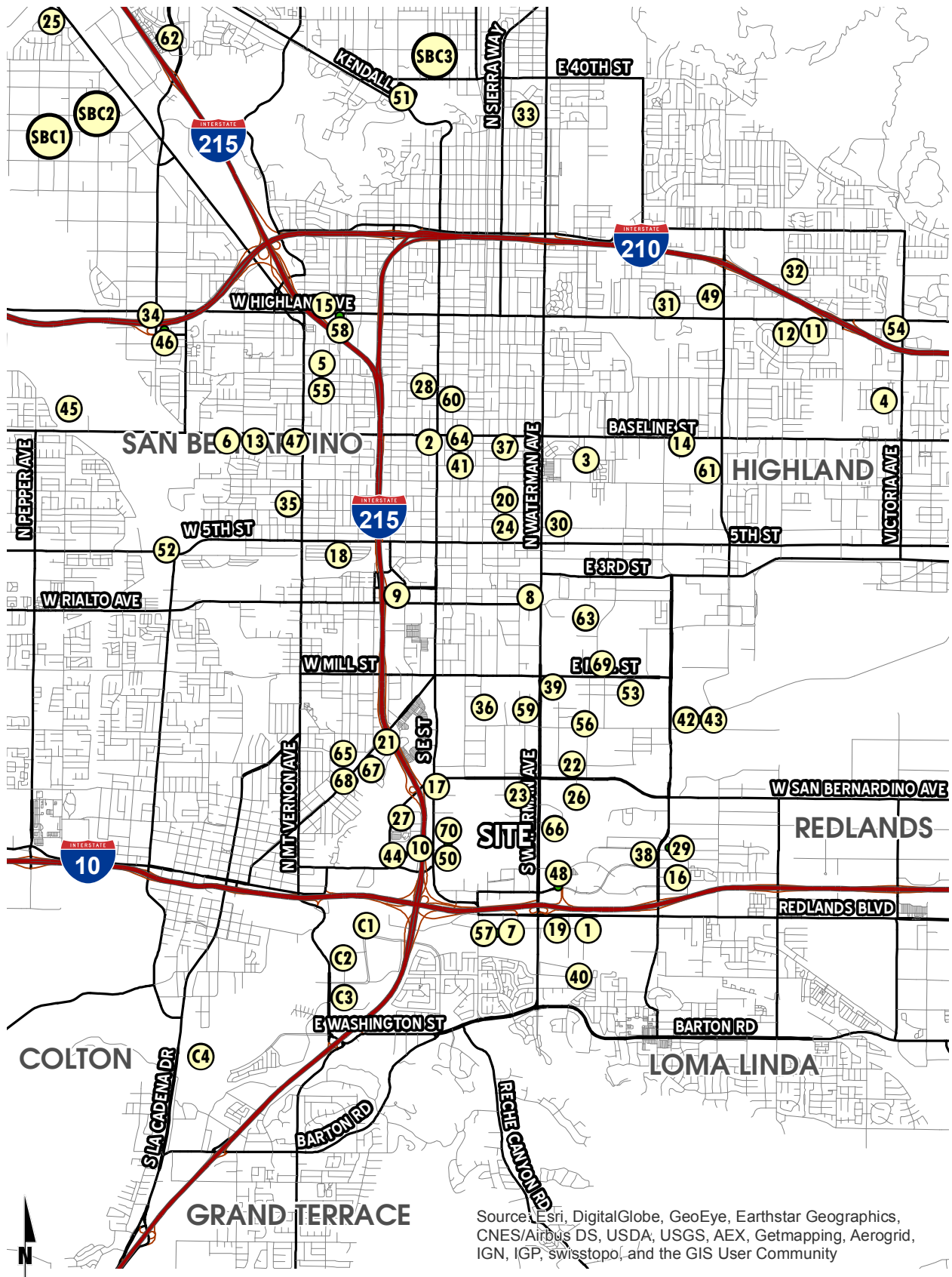
c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	403	117	229	211	399	165	602	245	45	721	264
Future Volume (veh/h)	58	403	117	229	211	399	165	602	245	45	721	264
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	64	443	86	252	232	411	181	662	234	49	792	253
Adj No. of Lanes	1	2	1	2	1	2	1	2	1	1	2	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	80	1006	818	658	836	2081	391	870	369	370	781	349
Arrive On Green	0.02	0.10	0.10	0.22	0.46	0.46	0.24	0.24	0.24	0.23	0.23	0.23
Sat Flow, veh/h	1619	3420	1524	3048	1800	2974	1619	3600	1526	1619	3420	1530
Grp Volume(v), veh/h	64	443	86	252	232	411	181	662	234	49	792	253
Grp Sat Flow(s),veh/h/ln	1619	1710	1524	1524	1800	1487	1619	1800	1526	1619	1710	1530
Q Serve(g_s), s	4.7	14.7	4.1	8.5	9.5	5.9	11.5	20.5	16.5	2.9	27.4	18.3
Cycle Q Clear(g_c), s	4.7	14.7	4.1	8.5	9.5	5.9	11.5	20.5	16.5	2.9	27.4	18.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	80	1006	818	658	836	2081	391	870	369	370	781	349
V/C Ratio(X)	0.80	0.44	0.11	0.38	0.28	0.20	0.46	0.76	0.63	0.13	1.01	0.72
Avail Cap(c_a), veh/h	100	1006	818	658	836	2081	391	870	369	370	781	349
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.76	0.76	0.76	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.4	44.9	17.8	40.2	19.7	6.6	38.8	42.3	40.8	36.8	46.3	42.8
Incr Delay (d2), s/veh	19.2	1.1	0.2	0.1	0.2	0.0	3.9	6.2	8.1	0.7	35.8	12.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	7.1	2.7	3.6	4.7	4.2	5.6	11.0	7.8	1.4	16.8	9.0
LnGrp Delay(d),s/veh	77.6	45.9	18.0	40.4	19.9	6.6	42.7	48.5	48.8	37.6	82.1	55.1
LnGrp LOS	E	D	B	D	B	A	D	D	D	D	F	E
Approach Vol, veh/h		593			895			1077			1094	
Approach Delay, s/veh		45.3			19.6			47.6			73.9	
Approach LOS		D			B			D			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	31.5	40.4		32.0	10.5	61.4		33.6				
Change Period (Y+Rc), s	5.1	* 5.1		4.6	4.6	5.1		4.6				
Max Green Setting (Gmax), s	9.4	* 35		27.4	7.4	37.3		29.0				
Max Q Clear Time (g_c+I1), s	10.5	16.7		29.4	6.7	11.5		22.5				
Green Ext Time (p_c), s	0.0	2.9		0.0	0.0	3.6		2.9				
Intersection Summary												
HCM 2010 Ctrl Delay			48.2									
HCM 2010 LOS			D									
Notes												

APPENDIX 4.1:
CUMULATIVE DEVELOPMENT RESEARCH

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EXHIBIT 4-5: CUMULATIVE DEVELOPMENT LOCATION MAP



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Add "CSB" to front of numbers

EXHIBIT 4-5: CUMULATIVE DEVELOPMENT LOCATION MAP

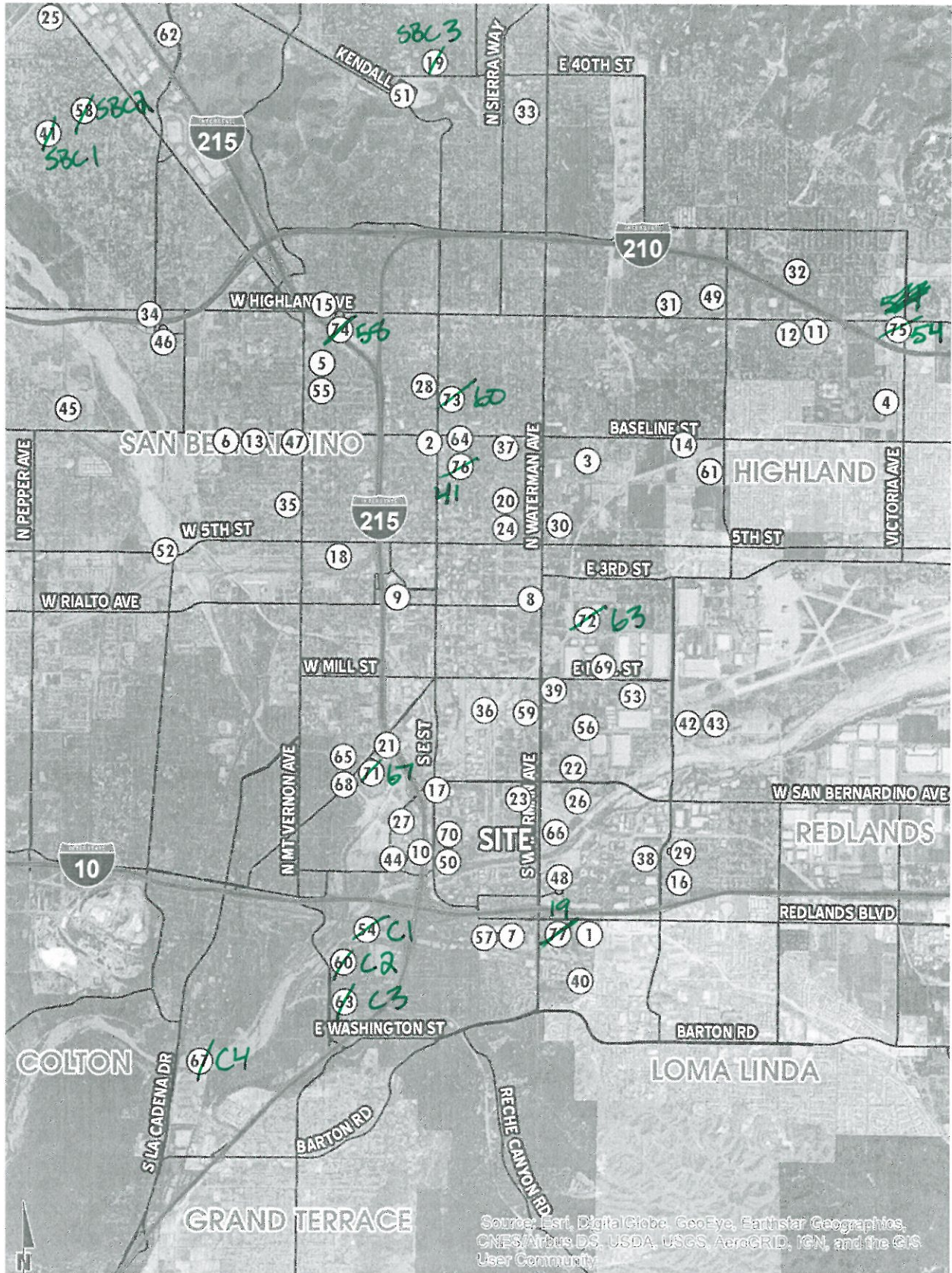


Table 4-3

Land Use Summary of Cumulative Development Projects

TAZ	Project Name	Land Use ¹	Quantity	Units ²
City of San Bernardino				
1	ADP 15-49	Urgent Care Center	12.648	TSF
2	CUP 17-02	Car Wash	6.265	TSF
3	CUP 11-13, TTM 18829 & DA12-02	Senior Housing	74	DU
		Multi-Family Housing	337	DU
		Condos	38	DU
4	CUP 12-04	Religious Facility Addition	0.714	TSF
5	CUP 12-06	Commercial Retail	9.180	TSF
		Fast Food w/ Drive Thru	2.400	TSF
6	CUP 12-12	K-6 Charter School	300	STU
7	CUP 12-13	Auditorium, Community Center	20.000	TSF
8	CUP 12-14	Discount Store	9.026	TSF
9	CUP 12-20	Discount Store	10.500	TSF
10	CUP 12-22	Auditorium, Banquet Hall	5.233	TSF
		Restaurant	0.800	TSF
11	CUP 13-01	Discount Store	26.907	TSF
12	CUP 13-07	Discount Store	12.500	TSF
13	CUP 13-14	Gas Station w/ Convenience Market	2.789	TSF
14	CUP 16-07	Car Sales	2.780	TSF
15	CUP 16-10	Used Car Sales	0.644	TSF
16	Raising Cane's (CUP 16-12)	Fast Food w/ Drive Thru	3.823	TSF
17	CUP 16-14	Used Car Sales	6.480	TSF
18	CUP 14-13	Restaurant/Night Club	6.400	TSF
19	MUP 17-02	Auto Repair	9.290	TSF
20	CUP 14-20	Holistic Learning Center	16.266	TSF
21	CUP 16-17	Gas Station w/ Convenience Market	12	VFP
		Car Wash	3.800	TSF
22	Orange Show Road Warehouse	High-Cube Warehouse	342.000	TSF
23	Waterman Industrial Center	High-Cube Warehouse	564.652	TSF
24	CUP 15-02	Gas Station w/ Convenience Market	2.800	TSF
25	CUP 15-03	Two Restaurants w/ Drive Thru	3.000	TSF
26	Alliance California Gateway South	High-Cube Warehouse	1199.360	TSF
27	CUP 16-18	Used Car Sales	7.531	TSF
28	CUP 15-10	Banquet Hall	12.000	TSF
29	CUP 15-12	Restaurant w/ Drive Thru	2.800	TSF
30	CUP 15-14	Gas Station w/ Convenience Market	5.542	TSF
31	CUP 15-17	Charter School	6.832	TSF
32	CUP 15-19	High School Expansion	26.718	TSF
33	CUP 15-20	Hotel	32.000	TSF
34	CUP 16-02	Convenience Market	3.800	TSF
		Drive Thru Car Wash	2.800	TSF
		Restaurant	2.000	TSF
		Gas Station	16	VFP
35	CUP 16-24	Religious Facility	15.340	TSF
36	National Orange Show Industrial	High-Cube Warehouse	616.000	TSF
		General Light Industrial	57.750	TSF
		Warehousing	78.960	TSF
37	CUP 16-08	Car Dealership/Auto Repair	1.37	AC

Table 4-3

Land Use Summary of Cumulative Development Projects

TAZ	Project Name	Land Use ¹	Quantity	Units ²
38	CUP 17-03	Starbucks w/Drive Thru	2.260	TSF
		Gas Station w/Convenience Market and Car Wash	6	VFP
39	DP2 12-02	Warehousing	345.802	TSF
40	DP2 12-03	Automobile Parts and Service Center	24.953	TSF
41	DP-D16-23	Dental Office	2.682	TSF
42	DP2 12-10	General Light Industrial	480.570	TSF
43	DP2 12-14	General Light Industrial	871.900	TSF
44	DP2 12-18	Automobile Dealership	30.300	TSF
45	DP-D13-01	Shipping Container Storage Yard	12.0	AC
46	DP-D13-02	Discount Store	12.406	TSF
47	DP-D13-05	Commercial Retail	9.180	TSF
48	DP-D14-17	Restaurant	11.300	TSF
49	CUP 16-26	Preschool	7.680	TSF
50	DP-D15-03	Recreational Facility	33.600	TSF
51	CUP 16-29	Veterinary Hospital	7.660	TSF
52	CUP 17-04	Storage Yard w/Steel Fabrication	5.000	TSF
53	DP-D15-06	Industrial Building	202.000	TSF
		Industrial Building	177.000	TSF
54	CUP 17-08	Motel	30	RM
55	DP-D16-20	Commercial	5.164	TSF
56	DP-D15-09	Industrial Building	154.560	TSF
57	DP-D15-12	Office Building	153.077	TSF
58	CUP 17-05	Gas Station w/Convenience Market and Car Wash	8	VFP
59	DP-D15-14	Industrial Building	127.327	TSF
60	DP-P16-07	Mixed Use	1.276	TSF
		Residential	1.448	TSF
61	DP-D16-06	Commercial Building Expansion	44.190	TSF
62	DP-D16-07	Building	32.000	TSF
63	DP-P16-04	Apartment	38	DU
64	DP-P14-06	Commercial Building	5.200	TSF
65	DP-P14-07	Senior Housing	82	DU
66	DP-D16-22	Warehouse	14.202	TSF
67	DP-P15-01	Industrial Park	94.965	TSF
68	DP-P15-04	Industrial Building	14.857	TSF
69	DP-D16-24	Industrial Building	476.632	TSF
70	DP-D16-27	Office Building	43.953	TSF
City of Colton				
C1	Steel Road/Santa Ana	Industrial Park	159.276	TSF
C2	Pacific Rail - Metal Shredder	Metal Shredder	1	MS
C3	Education/Office Building	General Office	114.071	TSF
C4	Soil Safe Land Improvement Project	Soil Safe Project	19	AC
San Bernardino County				
SBC1	DP2 12-09	Industrial Park	1,789.990	TSF
SBC2	DP-D15-13	Industrial Building	337.000	TSF
SBC3	CUP 16-15	Self-Storage Facility	91.500	TSF

¹ SFDR = Single Family Detached Residential

² DU = Dwelling Units; TSF = Thousand Square Feet; STU = Students; VFP = Vehicle Fueling Positions; MS = Metal Shredder

Land Use Summary of Cumulative Development Projects

Add "CSB" to front of numbers

TAZ	Project Name	Land Use ¹	Quantity	Units ²
1	ADP 15-49	Urgent Care Center	12.648	TSF
2	CUP 17-02	Car Wash	6.265	TSF
3	CUP 11-13, TTM 18829 & DA12-02	Senior Housing	74	DU
		Multi-Family Housing	337	DU
		Condos	38	DU
4	CUP 12-04	Religious Facility Addition	0.714	TSF
5	CUP 12-06	Commercial Retail	9.180	TSF
		Fast Food w/ Drive Thru	2.400	TSF
6	CUP 12-12	K-6 Charter School	300	STU
7	CUP 12-13	Auditorium, Community Center	20.000	TSF
8	CUP 12-14	Discount Store	9.026	TSF
9	CUP 12-20	Discount Store	10.500	TSF
10	CUP 12-22	Auditorium, Banquet Hall	5.233	TSF
		Restaurant	0.800	TSF
11	CUP 13-01	Discount Store	26.907	TSF
12	CUP 13-07	Discount Store	12.500	TSF
13	CUP 13-14	Gas Station w/ Convenience Market	2.789	TSF
14	CUP 16-07	Car Sales	2.780	TSF
15	CUP 16-10	Used Car Sales	0.644	TSF
16	Raising Cane's (CUP 16-12)	Fast Food w/ Drive Thru	3.823	TSF
17	CUP 16-14	Used Car Sales	6.480	TSF
18	CUP 14-13	Restaurant/Night Club	6.400	TSF
19	CUP 16-15	Self-Storage Facility	91.500	TSF
20	CUP 14-20	Holistic Learning Center	16.266	TSF
21	CUP 16-17	Gas Station w/ Convenience Market	12	VFP
		Car Wash	3.800	TSF
22	Orange Show Road Warehouse	High-Cube Warehouse	342.000	TSF
23	Waterman Industrial Center	High-Cube Warehouse	564.652	TSF
24	CUP 15-02	Gas Station w/ Convenience Market	2.800	TSF
25	CUP 15-03	Two Restaurants w/ Drive Thru	3.000	TSF
26	Alliance California Gateway South	High-Cube Warehouse	1199.360	TSF
27	CUP 16-18	Used Car Sales	7.531	TSF
28	CUP 15-10	Banquet Hall	12.000	TSF
29	CUP 15-12	Restaurant w/ Drive Thru	2.800	TSF
30	CUP 15-14	Gas Station w/ Convenience Market	5.542	TSF
31	CUP 15-17	Charter School	6.832	TSF
32	CUP 15-19	High School Expansion	26.718	TSF
33	CUP 15-20	Hotel	32.000	TSF
34	CUP 16-02	Convenience Market	3.800	TSF
		Drive Thru Car Wash	2.800	TSF
		Restaurant	2.000	TSF
		Gas Station	16	VFP
35	CUP 16-24	Religious Facility	15.340	TSF
36	National Orange Show Industrial	High-Cube Warehouse	616.000	TSF
		General Light Industrial	57.750	TSF
		Warehousing	78.960	TSF
37	CUP 16-08	Car Dealership/Auto Repair	1.37	AC
38	CUP 17-03	Starbucks w/Drive Thru	2.260	TSF
		Gas Station w/Convenience Market and Car Wash	6	VFP

SBC3

Land Use Summary of Cumulative Development Projects

TAZ	Project Name	Land Use ¹	Quantity	Units ²
39	DP2 12-02	Warehousing	345.802	TSF
40	DP2 12-03	Automobile Parts and Service Center	24.953	TSF
SBC1 41	DP2 12-09	Industrial Park	1,789.990	TSF
42	DP2 12-10	General Light Industrial	480.570	TSF
43	DP2 12-14	General Light Industrial	871.900	TSF
44	DP2 12-18	Automobile Dealership	30.300	TSF
45	DP-D13-01	Shipping Container Storage Yard	12.0	AC
46	DP-D13-02	Discount Store	12.406	TSF
47	DP-D13-05	Commercial Retail	9.180	TSF
48	DP-D14-17	Restaurant	11.300	TSF
49	CUP 16-26	Preschool	7.680	TSF
50	DP-D15-03	Recreational Facility	33.600	TSF
51	CUP 16-29	Veterinary Hospital	7.660	TSF
52	CUP 17-04	Storage Yard w/Steel Fabrication	5.000	TSF
53	DP-D15-06	Industrial Building	202.000	TSF
		Industrial Building	177.000	TSF
C1 54	Steel Road/Santa Ana	Industrial Park	159.276	TSF
55	DP-D16-20	Commercial	5.164	TSF
56	DP-D15-09	Industrial Building	154.560	TSF
57	DP-D15-12	Office Building	153.077	TSF
SBC2 58	DP-D15-13	Industrial Building	337.000	TSF
59	DP-D15-14	Industrial Building	127.327	TSF
C2 60	Pacific Rail - Metal Shredder	Metal Shredder	1	MS
61	DP-D16-06	Commercial Building Expansion	44.190	TSF
62	DP-D16-07	Building	32.000	TSF
C3 63	Education/Office Building	General Office	114.071	TSF
64	DP-P14-06	Commercial Building	5.200	TSF
65	DP-P14-07	Senior Housing	82	DU
66	DP-D16-22	Warehouse	14.202	TSF
C4 67	Soil Safe Land Improvement Project	Soil Safe Project	19	AC
68	DP-P15-04	Industrial Building	14.857	TSF
69	DP-D16-24	Industrial Building	476.632	TSF
70	DP-D16-27	Office Building	43.953	TSF
C5B 67 71	DP-P15-01	Industrial Park	94.965	TSF
C5B 63 72	DP-P16-04	Apartment	38	DU
C5B 60 58 73	DP-P16-07	Mixed Use	1.276	TSF
		Residential	1.448	TSF
C5B 64 74	CUP 17-05	Gas Station w/Convenience Market and Car Wash	8	VFP
C5B 54 75	CUP 17-08	Motel	30	RM
C5B 41 76	DP-D16-23	Dental Office	2.682	TSF
C5B 19 77	MUP 17-02	Auto Repair	9.290	TSF

¹ SFDR = Single Family Detached Residential

² DU = Dwelling Units; TSF = Thousand Square Feet; STU = Students; VFP = Vehicle Fueling Positions; MS = Metal Shredder

EXHIBIT 4-5: CUMULATIVE DEVELOPMENT LOCATION MAP

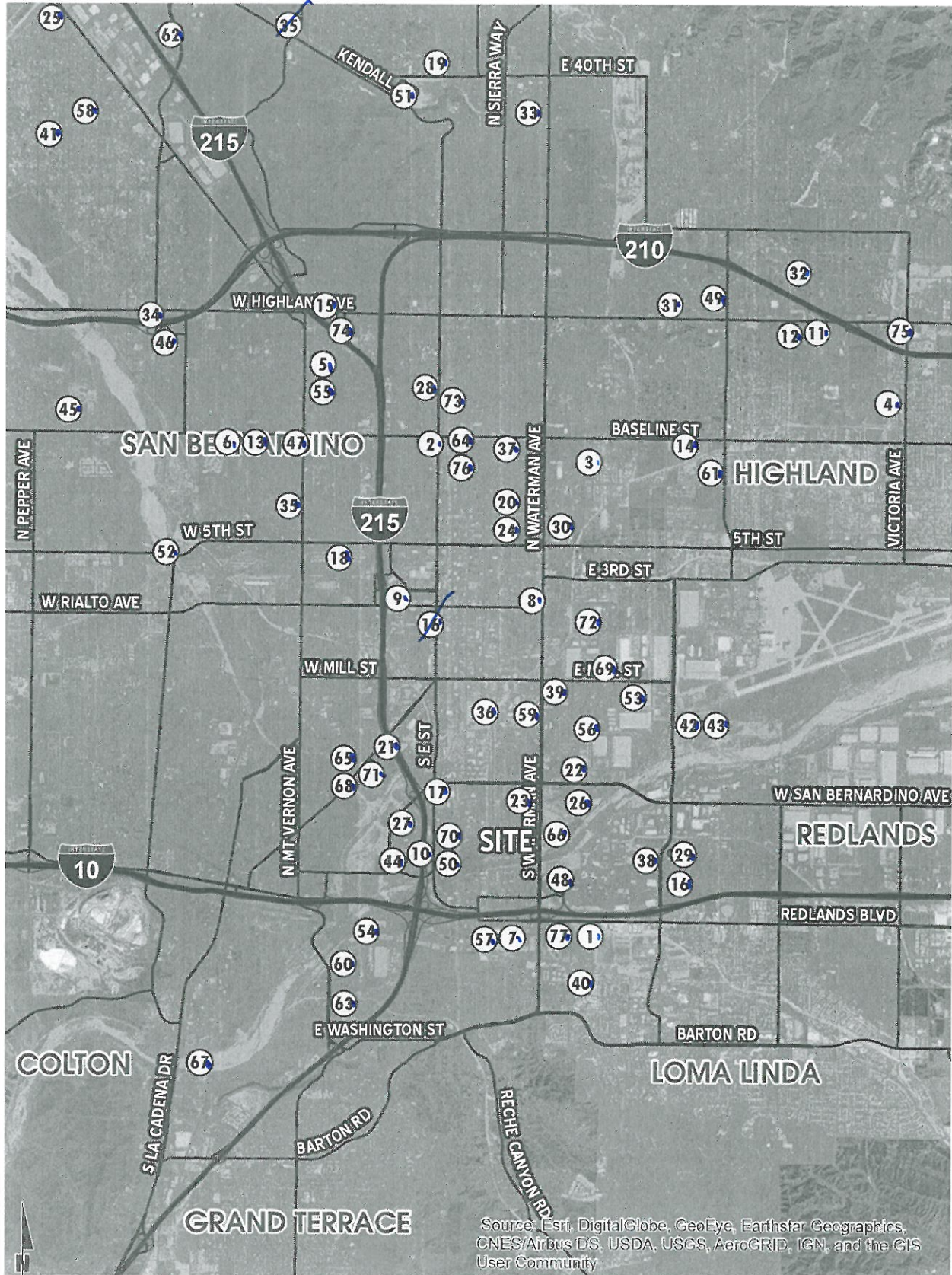
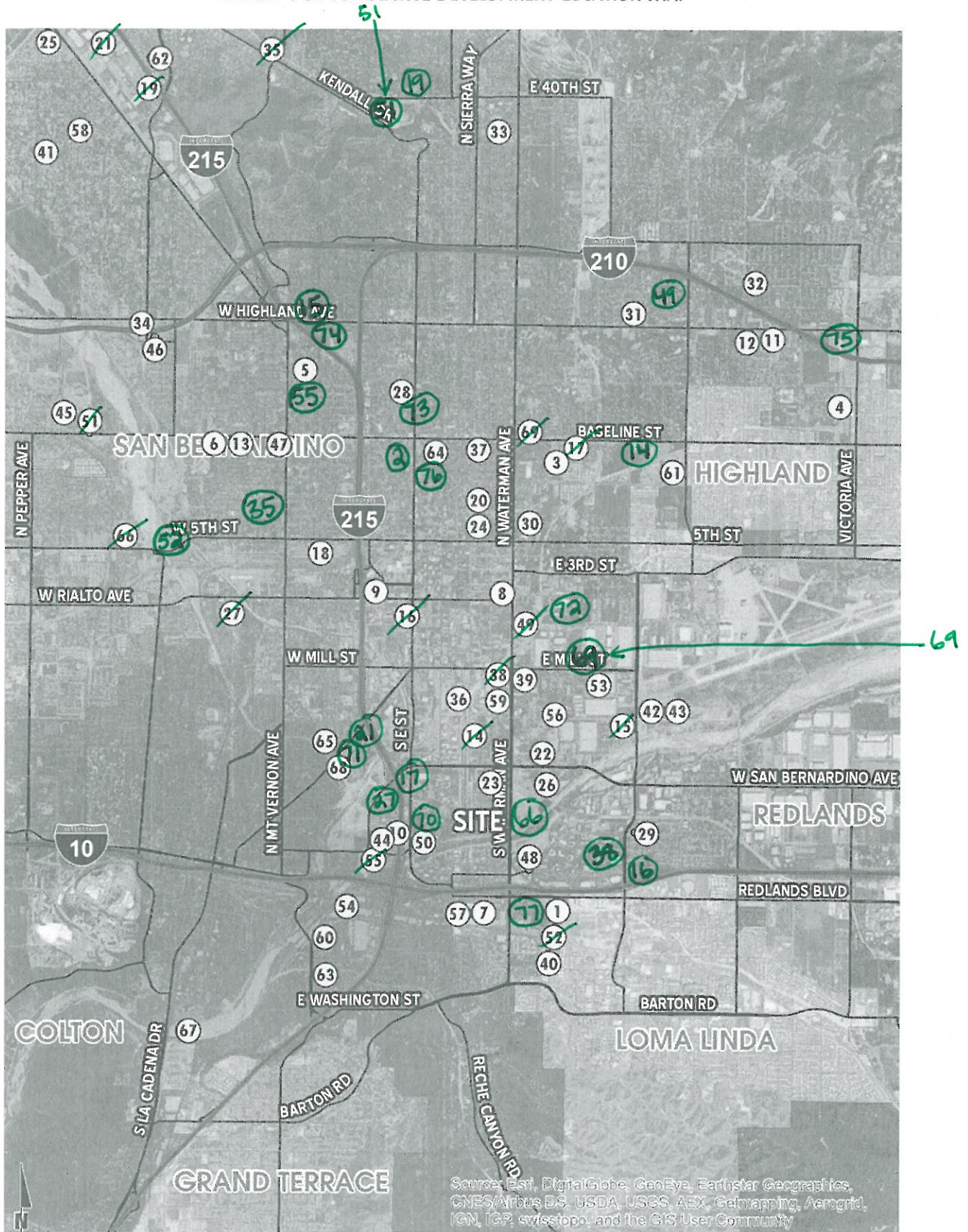


EXHIBIT 4-5: CUMULATIVE DEVELOPMENT LOCATION MAP



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Geomapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

• = New + Traffic Generating

City of San Bernardino
Community Development Department - Major Projects List
(Updated March 1, 2017)

File Name	Address (Project Name)	Project Summary	Ward	Date Planning Application Submitted	Planning Application Status	Date Application Approved	Building Permit Status	Date Status Updated	Staff Contact
ADP15-49	484 E. Redlands Boulevard	Urgent care center with exam rooms and offices.	3	9/10/2015	Approved by Planning Division	10/19/2015	Pending Plan Check Review	05/02/2016	Travis Martin
ADP15-23	100 E. Redlands Boulevard	Second drive-thru lane for an existing McDonald's	3	6/7/2016	Approved by Planning Division	07/19/2016	Permit Issued	12/01/2016	Chantal Power
ADP15-23	205 E. Redlands Boulevard	Facade improvements for an existing Burger King	3	6/9/2016	Approved by Planning Division	07/18/2016	Pending Plan Check Review	10/27/2016	Travis Martin
ADP16-44	346 E. 40th Street	Facade improvements to an existing McDonald's	4	8/23/2016	Approved by Planning Division	10/13/2016	Permit Issued	11/30/2016	Travis Martin
ADP15-45	399 S. E. Street	Facade improvements for the conversion of an existing building into a bakery, Old Town Baking Co.	3	9/1/2016	Approved by Planning Division	10/20/2016	Pending Plan Check Review	12/09/2016	Chantal Power
ADP15-59	7059 E. Highland Avenue	Facade improvements for an existing Jack in the Box	4	10/30/2016	Approved by Planning Division	12/19/2016	Pending Plan Check Submittal from Applicant	NA	Elizabeth Mora-Rodriguez
ADP15-55	1575 E. Highland Avenue	Facade improvements for an existing McDonald's	2	11/15/2016	Approved by Planning Division	12/19/2016	Pending Plan Check Review	02/02/2017	Elizabeth Mora-Rodriguez
CUP11-13, TTM 18828 and DA12-02	Waterman Gardens 610 E. Olive Street	Construct an affordable/mixed income community: 74-unit senior housing project, 337 multi-family units, 38 condo units, 45,000 s.f. recreational facility, a 58,200 s.f. community center, and a 7,400 s.f. administration/multi-purpose building. Approval of a Development Agreement.	1	8/1/2011	Pending Submittal of Phase 2	02/18/2014	Phase 1 Under Construction	08/10/2016	Oliver Mujica
CUP15-21	799 W. Baseline Street	Demolition of an existing gas station/restaurant and construct a new gas station with convenience store, self-serve car wash and smog check service	2	9/19/2013	Approved by Planning Commission	10/21/2015	Pending Plan Check Review	07/19/2016	Oliver Mujica
CUP15-05	3955 N. Valmont Avenue	Reestablish a gas station and construct a 3,300 s.f. restaurant space	6	4/30/2014	Scheduled for Planning Commission	04/19/2017	Pending Planning Commission Approval	NA	Travis Martin
CUP14-13	1341 W. 5th Street	Construct 6,365 s.f. La Nueva Copa Cubana restaurant and night club with an ABC Type 48 License	1	6/12/2014	Approved by Planning Commission	10/21/2015	Pending Plan Check Review	05/27/2016	Chantal Power
CUP15-23	524 S. Island Center Drive	Demolition and rebuild of Carris Jr. with drive-thru containing approximately 2,999 s.f.	3	6/23/2014	Approved by Planning Commission	04/15/2015	Plan Check Approved	12/15/2015	Oliver Mujica
CUP15-20	766 N. Waterman Avenue	New multi use building and outdoor recreational space for a holistic learning and cultural resource center "EISOI Holistic Campus"	1	9/4/2014	Approved by Planning Commission	01/20/2016	Pending Plan Check Review	09/04/2014	Chantal Power

File Name	Address (Project Name)	Project Summary	Ward	Date Planning Application Submitted	Planning Application Status	Date Application Approved	Building Permit Status	Date Status Updated	Staff Contact
CUP15-02	510 N. Waterman Avenue	Service station with six (6) pump island, a convenience store with an off-sale alcoholic beverage license (ABC Type 20 License) containing approximately 2,799 s.f.	1	2/27/2015	Approved by Planning Commission	04/15/2015	Permit Issued	02/07/2017	Oliver Mujica
CUP15-03	NE corner of Kendall Drive and Palm Avenue	Two (2) restaurants with drive-thru with an on-sale alcoholic beverage license (ABC Type 40 License) Starbucks and Dairy Queen	5	2/18/2015	Approved by Planning Commission	11/18/2015	Pending Plan Check Submittal from Applicant	12/09/2016	Travis Martin
CUP15-04	2120 E. Highland Avenue	Expansion of existing day care facility from 69 children to 137 children	5	3/5/2015	Approved by Planning Commission	09/16/2015	Plan Check Approved	04/26/2016	Travis Martin
CUP15-06	295 E. Caroline Street (Big Country)	Big Country family dining restaurant with live entertainment, saloon venue with an on-sale alcoholic beverage license (ABC Type 47 License)	3	4/22/2015	Pending Submittal of Environmental Document	NA	Pending Planning Commission Approval	NA	Oliver Mujica
CUP15-10	1480 S. E. Street	Establishment of a banquet hall within an existing retail center	3	6/11/2015	Approved by Planning Commission	09/16/2015	Permit Finalized	07/19/2016	Chantal Power
CUP15-12	1155 E. Gould Street	Construction of a restaurant with drive-thru containing approximately 2,800 s.f.	3	6/24/2015	Approved by Planning Commission	02/17/2016	Pending Plan Check Submittal from Applicant	NA	Travis Martin
CUP15-13	1525 Collins Ave	Construction of Starbucks with drive-thru containing approximately 3,000 s.f.	5	7/1/2015	Approved by Mayor and Common Council	03/07/2016	Permit Issued	02/16/2017	Oliver Mujica
CUP15-14	NE corner of 5th Street & Waterman Avenue	Service station with three (3) pump islands, a convenience store/donut shop/drive-thru containing approximately 5,542 s.f., Yum Yum Donuts	1	7/30/2015	Approved by Planning Commission	01/20/2016	Pending Plan Check Review	12/16/2015	Chantal Power
CUP15-16	6245 N. Palms Avenue	Modify previously approved CUP 8-2-03 to expand an existing church, preschool and child care facility	5	10/13/2015	Approved by Planning Commission	01/18/2017	Pending Plan Check Submittal from Applicant	NA	Travis Martin
CUP15-17	1148 E. Highland Avenue	Establishment of a Charter School within an existing commercial building, Options for Youth	7	10/19/2015	Approved by Planning Commission	02/17/2016	Temporary Certificate of Occupancy issued	12/19/2016	Chantal Power
CUP15-18	1200 E. Highland Avenue	Construction of Starbucks with drive-thru containing approximately 2,094 s.f.	4	11/5/2015	Approved by Planning Commission	01/20/2016	Permit Issued	10/18/2016	Travis Martin
CUP15-19	2772 N. Sterling Avenue Aquinas Catholic High School	New performing arts building, administration building, gymnasium lobby and aquatic center for existing Aquinas High School	4	11/12/2015	Approved by Planning Commission	02/17/2016	Permit Issued	04/05/2016	Chantal Power
CUP15-20	3972 N. Waterman Avenue	Conversion of an existing office building to a hotel containing approximately 9,796 s.f.	4	12/22/2015	Pending Response from Applicant	NA	Pending Planning Commission Approval	NA	Mary Blas
CUP16-02 FCN 16-02	2122 W. Highland Avenue	Arco AM/PM service station with eight (8) pump islands, a convenience store with a type 20 alcohol license containing approximately 3,800 s.f., a retail/food suite containing approximately 2,000 s.f., and a drive thru carwash containing approximately 2,800 s.f.	6	1/29/2016	Approved by Planning Commission	11/16/2015	Pending Plan Check Submittal from Applicant	NA	Chantal Power

File Name	Address (Project Name)	Project Summary	Ward	Date Planning Application Submitted	Planning Application Status	Date Application Approved	Building Permit Status	Date Status Updated	Staff Contact
CUP16-07	4295 E. Baseline Avenue	Automobile dealership and repair shop 2,740 TSF	2	3/28/2016	Pending Resubmittal from Applicant	NA	Pending Planning Commission Approval	NA	Elizabeth Mora-Rodriguez
CUP16-08	180 E. Baseline Ave	Used car dealership, auto repair, and auto related offices	2	4/13/2016	Approved by Planning Commission	06/15/2016	Pending Plan Check Review	11/08/2016	Chantal Power
CUP16-10	1208 W. Highland Avenue	Used car dealership 0.644 TSF	2	5/16/2016	Approved by Planning Commission	08/17/2016	Pending Plan Check Review	10/13/2016	Chantal Power
CUP16-12	SE Corner of Tippecanoe Avenue 8 West.	Railing Cafe's restaurant with a drive-thru containing approximately 3,825 s.f.	3	5/23/2016	Approved by Planning Commission	09/21/2016	Pending Plan Check Review	02/09/2017	Travis Martin
CUP16-14	West of E Street, South of Orange Show Road	Drive Time used car dealership 6,440 TSF	3	7/5/2016	Approved by Planning Commission	11/16/2016	Pending Plan Check Review	02/06/2017	Travis Martin
CUP16-15	550 W. 40th Street	Self-storage facility containing approximately 31,500 s.f.	4	7/14/2016	Approved by Planning Commission	09/21/2016	Pending Plan Check Review	02/09/2017	Chantal Power
CUP16-17	SWC of Inland Center Drive and Interstate 215	Service station with twelve (12) pump islands, a convenience store and a drive-thru car wash containing approximately 3,800 s.f.	3	9/14/2016	Pending Submittal of Environmental Document	NA	Pending Planning Commission Approval	NA	Chantal Power
CUP16-18	1325 S. Camino Real	Used car dealership 7,531 TSF	3	9/19/2016	Approved by Planning Commission	11/16/2016	Pending Plan Check Submittal from Applicant	NA	Elizabeth Mora-Rodriguez
CUP16-18	3154 W. Kernell Drive Dist.	Circle K service station with two (2) pump islands, a convenience store, and drive-thru car wash	5	9/20/2016	Scheduled for Planning Commission	04/19/2017	Pending Planning Commission Approval	NA	Travis Martin
CUP16-20	4224 W. 5th Street	Expansion of existing Pepe's night club	1	9/26/2016	Pending Resubmittal from Applicant	NA	Pending Planning Commission Approval	NA	Oliver Mujica
CUP16-21	W. Eastgate Road north of E. Highland Avenue Dist.	Drive-thru car wash	4	9/26/2016	Approved by Planning Commission	02/15/2017	Pending Plan Check Submittal from Applicant	NA	Mary Blas
CUP16-23	1811 S. Commerce Center East Dist.	Five (5) story, steel bridge girder hotel containing 106 rooms	3	10/10/2016	Pending Resubmittal from Applicant	NA	Pending Planning Commission Approval	NA	Travis Martin
CUP16-24	708 N. Mount Vernon Avenue	Religious facility containing approximately 15,540 s.f.	1	10/26/2016	New Application Under Review	NA	N/A	NA	Mary Blas
CUP16-26	1550 E. Pinalo Street	Pre-school containing approximately 7,680 s.f.	7	11/14/2016	Pending Resubmittal from Applicant	NA	N/A	NA	Elizabeth Mora-Rodriguez
CUP16-27	937 E. 5th Street	Upgrade of an existing ABC Type 20 License to an ABC Type 21 License for a Circle K containing approximately 1,182 s.f.	2	11/15/2016	New Application Under Review	NA	N/A	NA	Chantal Power
CUP16-29	999 W. 40th Street	Northside Veterinary Hospital containing approximately 7,660 s.f.	4	12/13/2016	Approved by Planning Commission	02/15/2017	Pending Plan Check Submittal from Applicant	NA	Chantal Power
CUP16-31	2384 N. Arden Avenue	Expansion of an existing 7-Eleven containing approximately 2,400 s.f.	4	12/20/2016	New Application Under Review	NA	N/A	NA	Travis Martin

City of San Bernardino
Community Development Department - Major Projects List
(Updated March 1, 2017)

File Name	Address (Project Name)	Project Summary	Ward	Date Planning Application Submitted	Planning Application Status	Date Application Approved	Building Permit Status	Date Status Updated	Staff Contact
CUP 17-01	860 N. Sierra Way	God's Helping Hand social service resource center containing approximately 6,735 s.f. LIG	1	1/5/2017	Pending Resubmittal from Applicant	NA	N/A	NA	Mary Blas
CUP 17-02	505 W. Baseline Street	Drive-thru carwash 6.265 TBF	2	1/25/2017	Scheduled for Planning Commission	03/15/2017	Pending Planning Commission Approval	NA	Chantal Power
CUP 17-03	SW corner of Tippecanoe Avenue and Brier Drive	Construction of Starbucks with drive-thru, 7-Eleven gas station with six (6) pump islands and drive-thru carwash containing approximately 1,100 s.f.	3	1/26/2017	New Application Under Review	NA	N/A	NA	Travis Martin
CUP 17-04	SW corner of Tippecanoe Avenue and Brier Drive	Construction of a contractor's storage yard with steel fabrication, an office building containing approximately 1,560 s.f., and storage building containing approximately 5,000 s.f., located on 3.09 acres.	3	1/30/2017	New Application Under Review	NA	N/A	NA	Mary Blas
CUP 17-05	SE corner of W. Highland Avenue and Muscupliabe Drive	Service station with eight (8) pump islands, a convenience store and a drive-thru carwash containing approximately 2,400 s.f.	2	2/7/2017	New Application Under Review	NA	N/A	NA	Travis Martin
CUP 17-06 DCA 17-02	715 W. 5th Street	Relocation of existing pawn shop	1	2/13/2017	New Application Under Review	NA	N/A	NA	Travis Martin
CUP 17-07	1405 E. Adams Street and E. Dumas Street	Financial vehicle tender recovery service building containing approximately 2,400 s.f., located on approximately 0.8 acres	3	2/14/2017	New Application Under Review	NA	N/A	NA	Chantal Power
CUP 17-08	SE of E. Highland Avenue and N. Valeria Drive	Motel containing thirty (30) guest rooms located on a parcel containing approximately 1.45 acres	4	2/15/2017	New Application Under Review	NA	N/A	NA	Elisabeth Mora-Rodriguez
DP-014-17	325 E. Hospitality Lane	Golden Corral containing approximately 11,300 s.f.	3	6/5/2014	Approved by Development Environmental Review Committee	12/04/2014	Temporary Certificate of Occupancy Issued	02/16/2017	Travis Martin
DP-015-02	2705 W. Lexington Way	Warehouse facility containing approximately 155,000 s.f.	6	8/8/2015	Approved by Development Environmental Review Committee	02/01/2016	Permit Issued	04/21/2016	Oliver Mujica
DP-015-06	890 E. Mill Street	Two (2) industrial buildings containing approximately 202,295 s.f. and 177,575 s.f.	1	8/5/2015	Approved by Development Environmental Review Committee	09/24/2015	Permit Issued	12/14/2016	Chantal Power
DP-015-09	NW corner of Central Avenue and Valley View Avenue	Industrial building containing approximately 154,560 s.f., located on 7.8 acres	1	9/30/2015	Approved by Development Environmental Review Committee	02/01/2016	Pending Plan Check Review	02/08/2017	Travis Martin
DP-015-10	265 W. Showcase Drive North	Expansion and renovation of <u>Tajama</u> of San Bernardino	3	9/30/2015	Pending Response from Applicant	NA	Pending Planning Division Approval	NA	Travis Martin
DP-015-12	152 E. Club Center Drive	Three (3) story office building containing approximately 337,000 s.f.	3	12/10/2015	Approved by Development Environmental Review Committee	03/24/2016	Permit Issued	01/30/2017	Travis Martin
DP-015-13	West of Lena Road between Orange Show Road & Norman Road	Industrial building containing approximately 337,000 s.f.	1	12/22/2015	Approved by Development Environmental Review Committee	07/14/2016	Pending Plan Check Review	01/17/2017	Travis Martin
DP-015-14	270 E. Central Avenue	Industrial building containing approximately 127,327 s.f.	3	12/23/2015	Approved by Development Environmental Review Committee	05/05/2016	Permit Issued	09/19/2016	Chantal Power
DP-015-01	E. 5th and W. Main Street	Growth Document Sales Facility, one-level retail building containing approximately 5.2 acres	2	2/2/2016	Approved by Development Environmental Review Committee	01/26/2017	Pending Plan Check Review	02/02/2017	Travis Martin

City of San Bernardino
Community Development Department - Major Projects List
(Updated March 1, 2017)

File Name	Address (Project Name)	Project Summary	Word	Date Planning Application Submitted	Planning Application Status	Date Application Approved	Building Permit Status	Date Status Updated	Staff Contact
DP-016-02	North of 6th Street and East of Waterman Avenue	Ground mounted solar facility on a vacant parcel containing approximately 18.5 acres.	2	2/2/2016	Approved by Development Environmental Review Committee	01/26/2017	Pending Plan Check Review	02/21/2017	Travis Martin
DP-016-03	4982 N. Hallmark Parkway	Industrial building containing approximately 340,080 s.f.	6	2/16/2016	Approved by Development Environmental Review Committee	05/19/2016	Pending Plan Check Review	10/17/2016	Chantal Power
DP-016-06	1895 N. Del Rosa Avenue	Expansion of an existing commercial building containing approximately 24,000 s.f. to approximately 44,190 s.f.; 59 County offices	2	2/25/2016	Approved by Development Environmental Review Committee	04/21/2016	Permit Issued	11/21/2016	Chantal Power
DP-016-07	4404 University Parkway LA FITNESS	LA Fitness containing approximately 52,000 s.f.	5	3/9/2016	Approved by Development Environmental Review Committee	07/14/2016	Permit Issued	02/14/2017	Travis Martin
DP-016-09	1333 S. Tippencanoe Avenue	Two (2) industrial buildings containing approximately 347,559 s.f. and 82,914 s.f.	3	5/9/2016	Approved by Development Environmental Review Committee	09/08/2016	Pending Plan Check Review	02/15/2017	Chantal Power
DP-016-11	SW Corner Saratoga Way & Georgia Boulevard	Industrial building containing approximately 153,010 s.f.	6	5/11/2016	Approved by Development Environmental Review Committee	09/22/2016	Permit Issued	02/07/2017	Oliver Mujica
DP-016-16	4605 N. D Street	Conversion of existing office building into a mixed-use development which will have (2) office suites and four (4) residential units	2	09/14/2016	Pending Resubmittal from Applicant	NA	Pending Planning Division Approval	NA	Oliver Mujica
DP-016-19	Junction of Gibson Boulevard and Palm Avenue	Two (2) industrial buildings containing approximately 325,926 s.f. and 392,273 s.f.	4	09/15/2016	Approved by Development Environmental Review Committee	12/08/2016	Pending Plan Check Review	01/29/2017	Oliver Mujica
DP-016-20	1625 N. Mount Vernon Avenue	Two-story commercial building containing approximately 5,164 s.f.	6	09/20/2016	Scheduled for Development Environmental Review Committee	03/23/2017	Pending Planning Division Approval	NA	Mary Blais
DP-016-22	499 E. Parkcenter Circle	Office building and warehouse containing approximately 14,202 s.f. on a property containing approximately 1.77 acres	3	09/28/2016	Approved by Development Environmental Review Committee	12/08/2016	Pending Plan Check Review	02/02/2017	Mary Blais
DP-016-23	NE Corner Baseline Street and Stoddard Avenue	Proposed general dental practice office providing restorative and surgical treatments	2	10/11/2016	Approved by Development Environmental Review Committee	12/08/2016	Pending Plan Check Review	02/21/2017	Chantal Power
DP-016-24	NE Corner Mill Street and Lena Road	Industrial building containing approximately 476,632 s.f.	1	11/09/2016	Approved by Development Environmental Review Committee	12/08/2016	Pending Plan Check Submittal from Applicant	NA	Travis Martin
DP-016-25	6th Street and Sterling Avenue	A request to change the zoning of a 20.58 acre parcel from Residential Medium High to Industrial Light in order to construct an industrial building containing approximately 400,000 s.f.	1	12/05/2016	Pending Resubmittal from Applicant	NA	Pending Planning Division Approval	NA	Chantal Power
DP-016-27	East side of "E" Street, North of Macley Drive	Office building containing approximately 43,953 s.f. on a property containing approximately 4.54 acres.	3	12/28/2016	New Application Under Review	NA	N/A	NA	Elizabeth Moira-Rodriguez

File Name	Address (Project Name)	Project Summary	Ward	Date Planning Application Submitted	Planning Application Status	Date Application Approved	Building Permit Status	Date Status Updated	Staff Contact
DP-P17-01	1342 S. Mountain View Avenue <i>Exists</i>	Two (2) industrial buildings containing approximately 85,000 s.f. and 9,000 s.f. on a property containing approximately 7.6 acres	3	01/03/2017	New Application Under Review	NA	N/A	NA	Chantal Power
DP-P17-02	2010 W. Foothill Boulevard	Construction of a truck and trailer parking facility on a property containing approximately 6.5 acres	6	02/06/2017	New Application Under Review	NA	N/A	NA	Travis Martin
DP-P17-03	East side of S. Waterman Avenue and South Central Avenue	General Plan Use Designation and Zoning District change of twenty-one (21) parcels containing approximately 9.25 acres	1	02/13/2017	New Application Under Review	NA	N/A	NA	Travis Martin
DP-P14-06	216 E. Baseline Street	Construction of a multi-tenant commercial building containing approximately 5,200 s.f.	2	10/1/2014	Pending Resubmittal from Applicant	NA	Pending Planning Commission Approval	NA	Travis Martin
DP-P14-07	Hillcrest Avenue and Colton Avenue	86-unit senior housing project	3	10/1/2014	Approved by Planning Commission	12/16/2015	Pending Plan Check Submittal from Applicant	NA	Oliver Mujica
DP-P15-01	539 S. Inland Center Drive	Eight (8) building industrial park containing approximately 54,965 s.f. on a property containing approximately 7.246 acres	3	4/29/2015	Pending Response from Applicant	NA	Pending Planning Commission Approval	NA	Travis Martin
DP-P15-04	895 S. Inland Center Drive	Industrial building containing approximately 14,957 s.f.	3	10/29/2015	Approved by Planning Commission	12/16/2015	Permit issued	02/09/2017	Travis Martin
DP-P16-02	2805 W. Rosemary Lane	Fourteen (14) single family residences	5	4/18/2016	Approved by Planning Commission	07/20/2016	Pending Plan Check Submittal from Applicant	06/18/2016	Chantal Power
DP-P16-03	2985 W. Belmont Avenue	Sixteen (16) single family residences	5	4/21/2016	Approved by Planning Commission	07/20/2016	Pending Plan Check Submittal from Applicant	NA	Elizabeth Mora-Rodriguez
DP-P16-04	505/525 E. Rigto Avenue	A 38-unit apartment complex	1	6/30/2016	Approved by Planning Commission	09/21/2016	Pending Plan Check Submittal from Applicant	NA	Chantal Power
DP-P16-07	1350 N. E Street	Mixed-use building containing approximately 1,276 s.f. and a residential unit containing approximately 1,448 s.f. on a property containing approximately 6,750 s.f.	2	12/19/2016	Pending Resubmittal from Applicant	NA	N/A	NA	Chantal Power
DP-P17-01	1342 S. Mountain View Avenue	Two (2) additions containing approximately 65,500 and 9,000 s.f. to an existing industrial building containing approximately 60,300 s.f. <i>SN 7776 (exists)</i>	3	1/3/2017	Scheduled for Development Environmental Review Committee	02/23/2017	Pending Planning Division Approval	NA	Chantal Power
DP-P17-02	NW corner of S. Waterman Avenue and E. Valley Street	General Plan Use Designation and Zoning District change of seven (7) parcels containing approximately 6.02 acres	1	2/13/2017	New Application Under Review	NA	N/A	NA	Travis Martin
MUP-17-02	327 E. Redlands Avenue	Automotive repair facility containing approximately 9,290 s.f. on a property containing .53 acres	3	2/2/2017	Approved by Development Environmental Review Committee	02/23/2017	Pending Plan Check Review	NA	Elizabeth Mora-Rodriguez
SP16-01	North side of Little League Dr. West of Palm Avenue	Rancho Palma Specific Plan/Environmental Impact Report for a community comprised of approx. 41.6 acres	5	2/17/2016	Scheduled for Mayor and Common Council	03/20/2017	Pending Planning Division Approval	NA	Chantal Power

Table 4-3

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Land Use Summary of Cumulative Development Projects

TAZ	Project Name	Land Use ¹	Quantity	Units ²
1	ADP 15-49	Urgent Care Center	12.648	TSF
2	ADP 16-17	Restaurant	21.25	TSF
3	CUP 11-13, TTM 18829 & DA12-02	Senior Housing	74	DU
		Multi-Family Housing	337	DU
		Condos	38	DU
4	CUP 12-04	Religious Facility Addition	0.714	TSF
5	CUP 12-06	Commercial Retail	9.180	TSF
		Fast Food w/ Drive Thru	2.400	TSF
6	CUP 12-12	K-6 Charter School	300	STU
7	CUP 12-13	Auditorium, Community Center	20.000	TSF
8	CUP 12-14	Discount Store	9.026	TSF
9	CUP 12-20	Discount Store	10.500	TSF
10	CUP 12-22	Auditorium, Banquet Hall	5.233	TSF
		Restaurant	0.800	TSF
11	CUP 13-01	Discount Store	26.907	TSF
12	CUP 13-07	Discount Store	12.500	TSF
13	CUP 13-14	Gas Station w/ Convenience Market	2.789	TSF
14	CUP 13-18	Truck Storage Yard	2.49	AC
15	CUP 13-26 & MM15-06	Convenience Market	3.000	TSF
		Restaurant	2.000	TSF
16	TPM 19534 & DPD 14-16	Medical/Educational Facility	150.000	TSF
17	CUP 14-10	Multi-Family Housing	76	DU
18	CUP 14-13	Restaurant/Night Club	6.400	TSF
19	CUP 14-19	Car Wash	3.000	TSF
20	CUP 14-20	Holistic Learning Center	16.266	TSF
21	CUP 14-21	Church	121.000	TSF
22	Orange Show Road Warehouse	High-Cube Warehouse	342.000	TSF
23	Waterman Industrial Center	High-Cube Warehouse	564.652	TSF
24	CUP 15-02	Gas Station w/ Convenience Market	2.800	TSF
25	CUP 15-03	Two Restaurants w/ Drive Thru	3.000	TSF
26	Alliance California Gateway South	High-Cube Warehouse	1199.360	TSF
27	CUP 15-09	Transitional Housing Facility	11.0	AC
28	CUP 15-10	Banquet Hall	12.000	TSF
29	CUP 15-12	Restaurant w/ Drive Thru	2.800	TSF
30	CUP 15-14	Gas Station w/ Convenience Market	5.542	TSF
31	CUP 15-17	Charter School	6.832	TSF
32	CUP 15-19	High School Expansion	26.718	TSF
33	CUP 15-20	Hotel	32.000	TSF
34	CUP 16-02	Convenience Market	3.800	TSF
		Drive Thru Car Wash	2.800	TSF
		Restaurant	2.000	TSF
		Gas Station	16	VFP
35	CUP 16-04	Religious Facility	5.851	TSF
36	National Orange Show Industrial	High-Cube Warehouse	616.000	TSF
		General Light Industrial	57.750	TSF
		Warehousing	78.960	TSF
37	CUP 16-08	Car Dealership/Auto Repair	1.37	AC
38	CUP 16-09	Truck Repair Facility	15.865	TSF
39	DP2 12-02	Warehousing	345.802	TSF

Land Use Summary of Cumulative Development Projects

TAZ	Project Name	Land Use ¹	Quantity	Units ²
40	DP2 12-03	Automobile Parts and Service Center	24.953	TSF
41	DP2 12-09	Industrial Park	1,789.990	TSF
42	DP2 12-10	General Light Industrial	480.570	TSF
43	DP2 12-14	General Light Industrial	871.900	TSF
44	DP2 12-18	Automobile Dealership	30.300	TSF
45	DP-D13-01	Shipping Container Storage Yard	12.0	AC
46	DP-D13-02	Discount Store	12.406	TSF
47	DP-D13-05	Commercial Retail	9.180	TSF
48	DP-D14-17	Restaurant	11.300	TSF
49	DP-D14-20, TPM 19573 GPA-14-08 & ZMA-14-16	Warehouse	427.000	TSF
50	DP-D15-03	Recreational Facility	33.600	TSF
51	DP-D15-04	Storage Facility	265.700	TSF
52	DP-D15-05	Truck Storage Yard	3.284	TSF
53	DP-D15-06	Industrial Building	202.000	TSF
		Industrial Building	177.000	TSF
54	Steel Road/Santa Ana	Industrial Park	159.276	TSF
55	DP-D15-08	Office Building	2.000	TSF
56	DP-D15-09	Industrial Building	154.560	TSF
57	DP-D15-12	Office Building	153.077	TSF
58	Spring Trails Specific Plan	SFDR	304	DU
59	DP-D15-14	Industrial Building	127.327	TSF
60	Pacific Rail - Metal Shredder	Metal Shredder	1	MS
61	DP-D16-06	Commercial Building Expansion	44.190	TSF
62	DP-D16-07	Building	32.000	TSF
63	Education/Office Building	General Office	114.071	TSF
64	DP-P14-06	Commercial Building	5.200	TSF
65	DP-P14-07	Senior Housing	82	DU
66	DP-P14-08	Condos	43	DU
67	Soil Safe Land Improvement Project	Soil Safe Project	19	AC
68	DP-P15-04	Industrial Building	14.857	TSF
69	SP 15-01 (Waterman Gardens)	Multi-Family Housing	411	DU
		Community Center	114.000	TSF

¹ SFDR = Single Family Detached Residential

² DU = Dwelling Units; TSF = Thousand Square Feet; STU = Students; VFP = Vehicle Fueling Positions; MS = Metal Shredder

OK

File Name	Address (Project Name)	Project Summary	Ward	Date Planning Application Submitted	Planning Application Status	Date Application Approved	Building Permit Status	Date Status Updated	Staff Contact
ADP15-49	484 E. Redlands Boulevard	Urgent care center with exam rooms and offices.	3	9/10/2015	Approved by Planning Division	10/19/2015	Pending Plan Check Review	05/02/2016	Travis Martin
ADP16-17	1675 N. Mount Vernon Ave	Fiesta Mexicana Restaurant, with an ABC Type 47 license	6	5/16/2016	Approved by Planning Division	07/18/2016	Permit issued	05/19/2016	Elizabeth Mora-Rodriguez
ADP16-22	160 E. Redlands Boulevard	Second drive thru lane for an existing McDonald's	3	6/7/2016	Approved by Planning Division	07/19/2016	Permit issued	12/01/2016	Chantal Power
ADP16-23	205 E. Redlands Boulevard	Facade improvements for an existing Burger King	3	6/9/2016	Approved by Planning Division	07/18/2016	Pending Plan Check Review	10/27/2016	Travis Martin
ADP16-43	140 E. 40th Street	Facade improvements to an existing McDonald's	4	8/23/2016	Approved by Planning Division	10/13/2016	Permit issued	11/30/2016	Travis Martin
ADP16-45	359 S. 4th Street	Facade improvements for the conversion of an existing building into a bakery, Old Town Baking Co.	3	9/1/2016	Approved by Planning Division	10/20/2016	Pending Plan Check Review	12/08/2016	Chantal Power
ADP16-50	365 E. Highland Avenue	Facade improvements for an existing Jack in the Box	4	10/20/2016	Approved by Planning Division	NA	Pending Plan Check Submittal from Applicant	NA	Elizabeth Mora-Rodriguez
ADP16-55	1375 E. Highland Avenue	Facade improvements for an existing McDonald's	2	11/15/2016	Approved by Planning Division	12/19/2016	Pending Plan Check Submittal from Applicant	NA	Elizabeth Mora-Rodriguez
CUP11-13, TTM 18829 and DA12-02	Waterman Gardens 610 E. Olive Street	Construct an affordable/mixed income community: 74-unit senior housing project, 337 multi-family units, 38 condo units, 45,000 s.f. recreational facility, a 58,200 s.f. community center, and a 7,400 s.f. administration/multi-purpose building. Approval of a Development Agreement.	1	8/1/2011	Pending Submittal of Phase 2	02/18/2014	Phase 1 Under Construction	05/10/2016	Oliver Mujica
CUP13-21	799 W. Baseline Street	Demolition of an existing gas station/restaurant and convenience store, gas station with convenience store, self-serve car wash and smog check service	2	8/13/2013	Approved by Planning Commission	10/21/2015	Pending Plan Check Review	07/19/2016	Oliver Mujica
CUP13-23	1541 W. Baseline Street	Religious use within a building containing approximately 4,180 s.f.	6	10/3/2013	Pending Resubmittal from Applicant	NA	N/A	NA	Oliver Mujica
CUP14-06	3985 N. Palm Avenue	Reestablish a gas station and construct a 3,000 s.f. restaurant space	6	4/30/2014	Scheduled for Planning Commission	03/15/2017	Pending Planning Commission Approval	NA	Travis Martin
CUP14-10	950 Valencia Avenue (National Core)	Construct an affordable 76-unit multi-family housing project in two buildings with on-site amenities including a 2,200 s.f. clubhouse community building and a 1,000 s.f. laundry/maintenance facility.	1	3/19/2014	Approved by Planning Commission	05/21/2014	Certificate of Occupancy issued	09/28/2016	Oliver Mujica

• = New + Traffic Generating

File Name	Address (Project Name)	Project Summary	Ward	Date Planning Application Submitted	Planning Application Status	Date Application Approved	Building Permit Status	Date Status Updated	Staff Contact
CUP14-13	1241 W. 5th Street	Construct 6,365 s.f. La Nueva Copa Cabrera restaurant and night club with an ABC Type 4B License	1	6/22/2014	Approved by Planning Commission	10/21/2015	Pending Plan Check Review	05/17/2016	Chantal Power
CUP14-13	524 S. Inland Center Drive	Demolition and rebuild of Carl's Jr. with drive-thru containing approximately 2,999 s.f.	3	6/23/2014	Approved by Planning Commission	04/15/2015	Plan Check Approved	12/15/2015	Oliver Mujica
CUP14-20	766 N. Waterman Avenue	New multi use building and outdoor recreational space for a holistic learning and cultural resource center "El Sol Holistic Campus"	1	5/4/2014	Approved by Planning Commission	01/20/2016	Pending Plan Check Review	09/04/2014	Chantal Power
CUP15-02	510 N. Waterman Avenue	Service station with six (6) pump island, a convenience store with an off-sale alcoholic beverage license (ABC Type 20 License) containing approximately 2,799 s.f.	1	2/27/2015	Approved by Planning Commission	04/15/2015	Plan Check Approved	11/28/2016	Oliver Mujica
CUP15-03	NE corner of Kendall Drive and Palm Avenue	Two (2) restaurants with drive-thru with an on-sale alcoholic beverage license (ABC Type 40 License) Starbucks and Dairy Queen	5	2/18/2015	Approved by Planning Commission	11/18/2015	Pending Plan Check Submittal from Applicant	NA	Travis Martin
CUP15-04	3454 W. Kendall Drive	Expansion of existing daycare facility serving children to 137 children	5	3/5/2015	Approved by Planning Commission	09/16/2015	Plan Check Approved	04/26/2016	Travis Martin
CUP15-06	295 E. Caroline Street (Big Country)	Big Country family dining restaurant with live entertainment saloon venue with an on-sale alcoholic beverage license (ABC Type 47 License)	3	4/22/2015	Pending Submittal of Environmental Document	NA	Pending Planning Commission Approval	NA	Oliver Mujica
CUP15-10	1480 S. "E" Street	Establishment of a banquet hall within an existing retail center	3	6/11/2015	Approved by Planning Commission	09/16/2015	Permit Finalized	07/19/2016	Chantal Power
CUP15-12	1155 E. Gould Street	Construction of a restaurant with drive-thru containing approximately 2,800 s.f.	3	6/24/2015	Approved by Planning Commission	02/17/2016	Pending Plan Check Submittal from Applicant	NA	Travis Martin
CUP15-13	1925 College Ave	Construction of donuts with drive-thru containing approximately 3,000 s.f.	5	7/1/2015	Approved by Mayor and Common Council	03/07/2016	Plan Check Approved	01/24/2017	Oliver Mujica
CUP15-14	NE corner of 5th Street & Waterman Avenue	Service station with three (3) pump islands, a convenience store/donut shop/drive-thru containing approximately 5,542 s.f. Yum Yum Donuts	1	7/30/2015	Approved by Planning Commission	01/20/2016	Pending Plan Check Review	06/23/2016	Chantal Power
CUP15-16	6245 N. Palma Avenue	Modify previously approved CU 82-93 to expand an existing church preschool and child care facility	5	10/13/2015	Approved by Planning Commission	05/18/2017	Pending Plan Check Submittal from Applicant	NA	Travis Martin
CUP15-17	1148 E. Highland Avenue	Establishment of a Charter School within an existing commercial building, Options for Youth	7	10/19/2015	Approved by Planning Commission	02/17/2016	Plan Check Approved	12/16/2016	Chantal Power
CUP15-18	4120 E. Highland Avenue	Construction of a school with drive-thru containing approximately 2,034 s.f.	4	11/5/2015	Approved by Planning Commission	01/20/2016	Permit Issued	10/18/2016	Travis Martin
CUP15-19	2772 N. Sterling Avenue Aquinas Catholic High School	New performing arts building, administration building, gymnasium lobby and aquatic center for existing Aquinas High School	4	11/12/2015	Approved by Planning Commission	02/17/2016	Permit Issued	04/05/2016	Chantal Power

City of San Bernardino
Community Development Department - Major Projects List
(Updated February 2, 2017)

File Name	Address (Project Name)	Project Summary	Ward	Date Planning Application Submitted	Planning Application Status	Date Application Approved	Building Permit Status	Date Status Updated	Staff Contact
CUP15-20	3972 N. Waterman Avenue	Conversion of an existing office building to a hotel containing approximately 9,796 s.f.	4	12/22/2015	Scheduled for Development Environmental Review Committee	02/23/2017	Pending Planning Commission Approval	NA	Mary Blais
CUP16-02 PCN 16-02	2122 W. Highland Avenue	Arco AM/PM service station with eight (8) pump islands, a convenience store with a Type 20 alcohol license containing approx. 3,800 sqft, a retail/food suite containing approx. 2,000 sqft, and a drive thru carwash containing approximately 2,800 s.f.	6	1/20/2016	Approved by Planning Commission	11/16/2016	Pending Plan Check Submittal from Applicant	NA	Chantal Power
CUP16-03 DCA16-02	5540 S. E. Street	Freeway oriented electronic massage center sign that is 10' high and is two-sided with a 14' x 48" display.	3	2/4/2016	Approved by Mayor and Common Council	07/05/2016	Pending Plan Check Review	02/24/2017	Oliver Mujica
CUP16-07	1295 E. Baseline Avenue	Automobile dealership and repair shop 2,760 TSF	2	3/28/2016	Scheduled for Planning Commission	02/15/2017	Pending Planning Commission Approval	NA	Elizabeth Mora-Rodriguez
CUP16-08	180 E. Baseline Ave	Used car dealership, auto repair, and auto related office	2	4/19/2016	Approved by Planning Commission	06/15/2016	Pending Plan Check Review	11/08/2016	Chantal Power
CUP16-10	1208 W. Highland Avenue	Used car dealership 0.644 TSF	2	5/16/2016	Approved by Planning Commission	08/17/2016	Pending Plan Check Review	10/13/2016	Chantal Power
CUP16-12	SE Corner of Tippecanoe Avenue & Lee St.	Raising Cain's restaurant with a drive-thru containing approximately 3,833 s.f.	3	5/25/2016	Approved by Planning Commission	09/21/2016	Pending Plan Check Review	12/21/2016	Travis Martin
CUP16-14	West of E Street, South of Orange Show Road	Drive Time used car dealership 6,460 TSF	3	7/5/2016	Approved by Planning Commission	11/16/2016	Pending Plan Check Review	12/28/2016	Travis Martin
CUP16-15	250 W. 40th Street	Self-storage facility containing approximately 91,500 s.f.	4	7/14/2016	Approved by Planning Commission	09/21/2016	Pending Plan Check Review	11/17/2016	Chantal Power
CUP16-17	SWC of Inland Center Dr and Interstate 215	Service station with twelve (12) pump islands, a convenience store and a drive-thru carwash containing approximately 3,800 s.f.	3	9/14/2016	Pending Submittal of Environmental Document	NA	Pending Planning Commission Approval	NA	Chantal Power
CUP16-18	1325 S. Camino Real	Used car dealership 7,531 TSF	3	9/19/2016	Approved by Planning Commission	11/16/2016	Pending Plan Check Submittal from Applicant	NA	Elizabeth Mora-Rodriguez
CUP16-19	2154 W. Leland Drive	Circle K service station with six (6) pump islands, convenience store, and drive-thru carwash	5	9/20/2016	Scheduled for Planning Commission	09/15/2017	Pending Planning Commission Approval	NA	Travis Martin
CUP16-20	1293 W. 5th Street	Extension of existing Pepsi Center	1	9/26/2016	Pending Resubmittal from Applicant	NA	Pending Planning Commission Approval	NA	Oliver Mujica
CUP16-21	W. Frontage Road, north of E. Highland Avenue	Drive-thru carwash	4	9/26/2016	Scheduled for Planning Commission	02/15/2017	Pending Planning Commission Approval	NA	Mary Blais
CUP16-23	1811 S. Commerce Center East	Five (5) story Stay Bridge Suites hotel containing 106 rooms	3	10/10/2016	Pending Resubmittal from Applicant	NA	Pending Planning Commission Approval	NA	Travis Martin

City of San Bernardino
 Community Development Department - Major Projects List
 (Updated February 1, 2017)

File Name	Address (Project Name)	Project Summary	Ward	Date Planning Application Submitted	Planning Application Status	Date Application Approved	Building Permits Status	Date Status Updated	Staff Contact
CUP-16-24	708 N. Mount Vernon Avenue	Religious facility containing approximately 15,340 s.f.	1	10/26/2016	New Application Under Review	NA	N/A	NA	Mary Blais
CUP-16-25	702 W. 2nd Street	Service station with convenience store containing approximately 1,400 s.f.	1	11/14/2015	Scheduled for Development Environmental Review Committee	02/09/2017	N/A	NA	Mary Blais
CUP-16-26	1550 E. Pinalo Street	Pre-school containing approximately 7,680 s.f.	7	11/24/2016	New Application Under Review	NA	N/A	NA	Elizabeth More-Rodriguez
CUP-16-27	337 E. 9th Street	Upgrade of an existing ABC Type 20 license to an ABC Type 22 license for a Circle K containing approximately 1,162 s.f.	2	11/15/2015	New Application Under Review	NA	N/A	NA	Chantal Power
CUP-16-29	939 W. 40TH Street	Northside Veterinary Hospital containing approximately 7,650 s.f.	4	12/13/2016	Scheduled for Planning Commission	02/15/2017	Pending Planning Commission Approval	NA	Chantal Power
CUP-16-31	2382 N. Arden Avenue	Expansion of an existing 728 s.f. license containing approximately 2,400 s.f.	4	12/20/2016	New Application Under Review	NA	N/A	NA	Travis Martin
CUP-17-01	840 N. Sierra Way	God's Healing Hand social service resource center containing approximately 6,735 s.f.	1	1/5/2017	New Application Under Review	NA	N/A	NA	Mary Blais
DP-D14-17	325 E. Hospitality Lane	Golden Corral containing approximately 11,300 s.f.	3	6/5/2014	Approved by Development Environmental Review Committee	12/04/2014	Permit Issued	04/21/2016	Travis Martin
DP-D15-02	2705 W. Lexington Way	Warehouse facility containing approximately 155,000 s.f.	6	3/3/2015	Approved by Development Environmental Review Committee	02/04/2016	Permit Issued	04/21/2016	Oliver Mujica
DP-D15-06	990 E. Mill Street	Two (2) industrial buildings containing approximately 202,295 s.f. and 177,575 s.f.	1	8/5/2015	Approved by Development Environmental Review Committee	09/24/2015	Permit Issued	12/14/2016	Chantal Power
DP-D15-09	N/W corner of Central Avenue and Valley View Avenue	Industrial building containing approximately 154,580 s.f. located on 7.8 acres	1	9/30/2015	Approved by Development Environmental Review Committee	02/04/2016	Pending Plan Check Submittal from Applicant	NA	Travis Martin
DP-D15-10	765 W. Alhambra Drive North	Expansion and renovation of Toyota of San Bernardino	3	9/30/2015	Pending Response from Applicant	NA	Pending Planning Division Approval	NA	Travis Martin
DP-D15-12	152 E. Club Center Drive	Three (3) story office building approximately 337,000 s.f.	3	12/10/2015	Approved by Development Environmental Review Committee	09/24/2016	Permit Issued	11/17/2016	Travis Martin
DP-D15-13	West of Lena Road between Orange Show Road & Norman Road	Industrial building containing approximately 337,000 s.f.	1	12/22/2015	Approved by Development Environmental Review Committee	07/14/2016	Pending Plan Check Review	01/17/2017	Travis Martin
DP-D15-14	270 E Central Avenue	Industrial building containing approximately 127,327 s.f.	3	12/28/2015	Approved by Development Environmental Review Committee	05/05/2016	Permit Issued	09/19/2016	Chantal Power
DP-D16-01	East side of Waterman Avenue between 5th Street and 6th Street	Ground-mounted solar facility on a vacant parcel approximately 5.2 acres	2	1/2/2016	Approved by Development Environmental Review Committee	01/26/2017	Pending Plan Check Review	NA	Travis Martin
DP-D16-02	North of 6th Street and East of Waterman Avenue	Ground-mounted solar facility on a vacant parcel approximately 18.5 acres	2	2/2/2016	Approved by Development Environmental Review Committee	01/26/2017	Pending Plan Check Review	NA	Travis Martin

City of San Bernardino
 Community Development Department - Major Projects List
 (Updated February 1, 2017)

File Name	Address (Project Name)	Project Summary	Ward	Date Planning Application Submitted	Planning Application Status	Date Application Approved	Building Permit Status	Date Status Updated	Staff Contact
DP-016-03	4962 N. Hillmark Parkway	Industrial building containing approximately 340,080 s.f.	6	2/15/2015	Approved by Development Environmental Review Committee	05/19/2015	Pending Plan Check Review	10/17/2015	Chantal Power
DP-016-06	1535 N. Del Rosa Avenue	Expansion of an existing commercial building containing approximately 34,000 s.f. to approximately 44,180 s.f. 55 County offices	2	2/25/2016	Approved by Development Environmental Review Committee	04/21/2016	Permit Issued	11/24/2016	Chantal Power
DP-016-07	4404 University Parkway LA FITNESS	LA Fitness containing approximately 32,000 s.f.	5	3/9/2016	Approved by Development Environmental Review Committee	07/14/2016	Pending Plan Check Review	12/13/2016	Travis Martin
DP-016-09	1333 S. Tippecanoe Avenue	Two (2) industrial buildings containing approximately 347,559 s.f. and 82,614 s.f.	3	5/3/2016	Approved by Development Environmental Review Committee	09/08/2016	Pending Plan Check Submittal from Applicant	NA	Chantal Power
DP-016-11	SW Corner Saratoga Way & Georgia Boulevard	Industrial building containing approximately 155,010 s.f.	6	5/11/2016	Approved by Development Environmental Review Committee	09/22/2016	Pending Plan Check Review	12/21/2016	Oliver Mujica
DP-016-13	1005 N. D Street	Conversion of existing office building into a mixed use development with two (2) office suites and four (4) residential units	2	09/14/2016	Scheduled for Development Environmental Review Committee	02/23/2017	Pending Planning Division Approval	NA	Travis Martin
DP-016-19	Intersection of Cajon Boulevard and Palm Avenue Dixone	Two (2) industrial buildings containing approximately 325,920 s.f. and 392,273 s.f.	4	09/15/2016	Approved by Development Environmental Review Committee	12/08/2016	Pending Plan Check Review	01/29/2017	Oliver Mujica
DP-016-20	1629 N. Mount Vernon Avenue	Two-story commercial building containing approximately 5,164 s.f.	6	09/20/2016	Pending Resubmittal from Applicant	NA	Pending Planning Division Approval	NA	Mary Blais
DP-016-22	499 E. Parkcenter Circle	Office building and warehouse containing approximately 14,202 s.f. on a property containing approximately 1.77 acres	3	09/28/2016	Approved by Development Environmental Review Committee	12/08/2016	Pending Plan Check Submittal from Applicant	NA	Mary Blais
DP-016-23	NE Corner Baseline Street and Stoddard Avenue	Office building and warehouse containing approximately 14,202 s.f. on a property containing approximately 1.77 acres	2	10/14/2016	Approved by Development Environmental Review Committee	12/09/2016	Pending Plan Check Submittal from Applicant	NA	Chantal Power
DP-016-24	NE Corner Mill Street and Lena Road	Industrial building containing approximately 476,632 s.f.	1	11/09/2016	Approved by Development Environmental Review Committee	12/08/2016	Pending Plan Check Submittal from Applicant	NA	Travis Martin
DP-016-25	Shawnee and Sterling Avenue	A request to change the zoning of a 20.58 acre parcel from Residential Medium-Density to Industrial Light in order to construct an industrial building containing approximately 400,000 s.f.	1	12/05/2016	Pending Resubmittal from Applicant	NA	Pending Planning Division Approval	NA	Chantal Power
DP-016-27	East side of "E" Street, North of Mackay Drive	Office building containing approximately 43,953 s.f. on a property containing approximately 4.64 acres	3	12/28/2016	New Application Under Review	NA	N/A	NA	Elizabeth Mera-Rodriguez
DP-016-28	1343 S. Mountain View Avenue Exists	Two (2) industrial buildings containing approximately 85,000 s.f. and 9,000 s.f. on a property containing approximately 7.8 acres	3	01/09/2017	New Application Under Review	NA	N/A	NA	Chantal Power

File Name	Address (Project Name)	Project Summary	Ward	Date Planning Application Submitted	Planning Application Status	Date Application Approved	Building Permit Status	Date Status Updated	Staff Contact
DP-P14-06	218 E. Baseline Street	Construction of a multi-tenant commercial building containing approximately 5,200 s.f.	2	10/1/2014	Pending Response from Applicant	NA	Pending Planning Commission Approval	NA	Travis Martin
DP-P14-07	Hilcrest Avenue and Colton Avenue	86-unit senior housing project	3	10/1/2014	Approved by Planning Commission	12/16/2015	Pending Plan Check Submittal from Applicant	NA	Oliver Mujica
DP-P15-01	939 S. Inland Center Drive	Eight (8) building industrial park containing approximately 94,965 s.f. on a property containing 7,746 acres	3	4/29/2015	Pending Response from Applicant	NA	Pending Planning Commission Approval	NA	Travis Martin
DP-P15-04	993 S. Inland Center Drive	Industrial building containing approximately 14,857 s.f.	3	10/29/2015	Approved by Planning Commission	12/16/2015	Plan Check Approved	06/15/2016	Travis Martin
DP-P16-02	2805 W. Rosemary Lane	Fourteen (14) single family residences	5	4/18/2016	Approved by Planning Commission	07/20/2016	Pending Plan Check Submittal from Applicant	04/18/2016	Chantal Power
DP-P16-03	2935 W. Belmont Avenue	Sixteen (16) single family residences	5	4/21/2016	Approved by Planning Commission	07/20/2016	Pending Plan Check Submittal from Applicant	NA	Elizabeth MORA-Rodriguez
DP-P16-04	505/525 E. Rialto Avenue	A 38-unit apartment complex	1	6/30/2016	Approved by Planning Commission	09/21/2016	Pending Plan Check Submittal from Applicant	NA	Chantal Power
DP-P16-07	1360 N. "E" Street	Mixed-use building containing approximately 1,276 s.f. and a residential unit containing approximately 1,446 s.f. on a property containing approximately 6,750 s.f.	2	12/19/2016	New Application Under Review	NA	N/A	NA	Chantal Power
SP16-01	North side of Little League Dr. West of Palm Avenue	Rancho Palma Specific Plan/Environmental Impact Report for a community comprised of approx. 41.6 acres	5	2/17/2016	Scheduled for Development/Environmental Review Committee	01/12/2017	Pending Planning Division Approval	NA	Chantal Power

- Old New
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EXHIBIT 5: CUMULATIVE DEVELOPMENT LOCATION MAP



Table 3

Land Use Summary of Cumulative Development Projects

10/87

TAZ	Project Name	Land Use ¹	Quantity	Units ²
1	ADP 15-49	Urgent Care Center	12,648	TSF
2	ADP 16-17	Restaurant	21,250	TSF
3	CUP 11-13, TTM 18829 & DA12-02 (Waterman Gardens)	Senior Housing	74	DU
		Multi-Family Housing	337	DU
		Condos	38	DU
✓ 4	CUP 12-04	Religious Facility Addition	0.714	TSF
✓ 5	CUP 12-06	Commercial Retail	9.180	TSF
		Fast Food w/ Drive Thru	2.400	TSF
✓ 6	CUP 12-12	K-6 Charter School	300	STU
✓ 7	CUP 12-13	Auditorium, Community Center	20.000	TSF
✓ 8	CUP 12-14	Discount Store	9.026	TSF
✓ 9	CUP 12-20	Discount Store	10.500	TSF
✓ 10	CUP 12-22	Auditorium, Banquet Hall	5.233	TSF
		Restaurant	0.800	TSF
✓ 11	CUP 13-01	Discount Store	26.907	TSF
✓ 12	CUP 13-07	Discount Store	12.500	TSF
✓ 13	CUP 13-14	Gas Station w/ Convenience Market	2.789	TSF
✓ 15	CUP 13-26 & MM15-06	Truck Storage Yard	2.49	AC
		Convenience Market	3	TSF
✓ 15	CUP 13-26 & MM15-06	Restaurant	2	TSF
✓ 16	TPM 19534 & DPD-14-16	Medical/Educational Facility	150	TSF
✓ 17	CUP 14-10	Multi-Family Housing	76	DU
18	CUP 14-13	Restaurant/Night Club	6.4	TSF
19	CUP 14-19	Car Wash	3	TSF
20	CUP 14-20	Holistic Learning Center	464	TSF
21	CUP 14-21	Church	121	TSF
22	CUP 14-24	Truck Storage Yard		
23	CUP 15-01	Car Wash Expansion		
24	CUP 15-02	Gas Station w/ Convenience Market	2,800	TSF
25	CUP 15-03	Two Restaurants w/ Drive Thru	3,000	TSF
26	CUP 15-06	Restaurant		
27	CUP 15-09	Transitional Housing Facility	11.0	AC
28	CUP 15-10	Banquet Hall	12,000	TSF
29	CUP 15-12	Restaurant w/ Drive Thru	2,800	TSF
		Convenience Market w/ Drive Thru	2,250	TSF
30	CUP 15-14	Gas Station	2,250	TSF
31	CUP 15-17	Charter School	6,832	TSF
32	CUP 15-19	High School Expansion	26,718	TSF
33	CUP 15-20	Hotel	32,00	TSF
34	CUP 16-02	Convenience Market	3.8	TSF
		Drive Thru Car Wash	2.800	TSF
		Restaurant	2.00	TSF
		Gas Station	8.16	PI
35	CUP 16-04	Religious Facility	5,851	TSF
36	CUP 16-06	Sobering Center	1,200	AC
37	CUP 16-08	Car Dealership/Auto Repair	1,37	AC
38	CUP 16-09	Truck Repair Facility	15,405	TSF
✓ 39	DP2 12-02	Warehousing	345,802	TSF
✓ 40	DP2 12-03	Automobile Parts and Service Center	24,953	TSF

Standard Font 10pt Calibri
Centered footnotes 8pt Calibri

Google search to see if you can find add info

Gas Station Conv Market

3 dec.

16,266

5542

VFP

NT = no traffic
 LTG = low traffic generator

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City of San Bernardino
 Community Development Department - Major Projects List
 (Updated June 9, 2016)

File Name	Address (Project Name)	Project Summary	City Council Ward	Date Application Submitted	Application Status	Building Permit Status	Staff Contact
DP206-28	5959 N. Palm Avenue	Construction of a 678,275 square foot distribution center on 39.4 acres <i>Distance</i>	6	11/2/2006	Approved by Planning Commission on 9/28/11	Building Plan Check Approved 5/31/16 Grading Permit Finalized Block Wall Permit Issued 2/12/15	Oliver Mujica
ADP15-49	485 E. Redlands Boulevard	Proposed conversion of an existing vacant one-story warehouse into a two-story urgent care center with exam rooms and offices. <i>10,48 SF</i>	3	9/10/2015	Approved by Planning Division on 10/19/15	Building Plan Check Submitted 5/2/16	Troy Martin
ADP15-62	1375 S. "E" Street	Tenant Improvements for an existing market (La Surtidora Cash & Carry) <i>NT</i>	3	10/22/2015	Pending Re-Submittal from Applicant	Pending Planning Commission Consideration	Elizabeth Mora-Rodriguez
ADP 16-003	2865 N. Golden Avenue	Convert and existing single family residence into three (3) units <i>low traffic generator</i>	7	1/12/2016	Approved by Planning Division on 05/17/16	Building Permit Issued on 03/10/16	Chantal Power
ADP16-04	618 W. 4th Street	Request to allow ABC License for the 95 Cents Store <i>NT</i>	1	1/14/2016	Scheduled for Planning Commission on 05/15/16	Pending Planning Commission Consideration	Chantal Power
ADP16-08	1090 W. Ostroms Way	A request to construct improvements to an existing drive-thru restaurant <i>NT</i>	6	2/17/2016	Approved by Planning Division on 3/18/15	Building Plan Check Submitted on 2/17/16	Chantal Power
ADP16-10	1870 E. Victoria Avenue	A request to construct two (2) duplexes <i>LTG</i>	1	3/9/2016	Approved by Planning Division 05/17/15	Pending Building Plan Check Submittal	Chantal Power
ADP16-11	840 N. Medical Center Drive	A request to construct a custom patio cover for an existing restaurant <i>NT</i>	3	3/16/2016	Pending Re-Submittal from Applicant	Pending Planning Division Approval	Elizabeth Mora-Rodriguez
ADP16-17	1675 N. Mount Vernon Ave	A request to establish a restaurant with an ABC Type 47 license <i>21,250 SF</i>	6	5/16/2016	New Application Under Review	Pending Planning Division Approval	Elizabeth Mora-Rodriguez
CUP11-13, TTM 15829 and DA12-02	Waterman Gardens 1610 E. Olive Street	Construct an affordable/mixed income community: 74-unit senior housing project, 337 multi-family units, 38 condo units, 45,000-sq. ft. recreational facility, a 58,200-sq. ft. community center, and a 7,400-square foot administration/multi-purpose building. Approval of a Development Agreement.	1	9/1/2011	Approved by Mayor and Common Council on 2/28/14 Amended Application Submitted on 10/26/15	Building Permits Issued Demo Permit Issued 3/10/16 Civil Plans Issued	Oliver Mujica
CUP13-18	1027 S. Washington Avenue	Establish truck storage yard	3	6/27/2013	Approved by Planning Commission on 11/18/2015	Pending Building Plan Check Submittal	Oliver Mujica

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City of San Bernardino
 Community Development Department - Major Projects List
 (Updated June 8, 2015)

File Name	Address (Project Name)	Project Summary	City Council Ward	Date Application Submitted	Application Status	Building Permit Status	Staff Contact
CUP13-21	799 W. Baseline Street	Demolition of existing gas station/restaurant and construct a new gas station with convenience store, self-serve car wash and smog check service <i>LIG</i>	2	8/13/2013	Approved by Planning Commission on 10/21/15	Pending Building Plan Check Submittal	Oliver Mujica
CUP13-23 MM15-06	SW corner Tippecanoe and Central Avenue - 806 S. Tippecanoe 02800-231-10-0000	Construct a gas station with a 3,050-sq. ft. convenience store with a Type 20 ABC license (Off-sale, Beer & Wine), and a 2,000-square foot restaurant	1	12/13/2013	Approved by Planning Commission on 7/16/14	Building Permit issued 8/20/15 Site Under Construction	Oliver Mujica
CUP14-04	2586 Shenandoah Way (Co-West)	Wastewater treatment plant, a bio-digester system and a hazardous waste bulking transfer facility in an existing 63,000-sq ft. industrial building <i>NTI</i>	6	2/26/2014	Approved by Planning Commission on 11/19/14	Building Permit Finished 05/19/15 Site Under Construction	Oliver Mujica
CUP14-08	5985 N. Palm Avenue	Reestablish a gas station and construct a 5,000-sq. ft. multi-tenant building <i>DISTANCE</i>	6	4/30/2014	Scheduled for D/ERC on 06/16/16	Pending Planning Commission Consideration	Oliver Mujica
TPM 19534 DFD-14-16	250 S. "G" Street (Loma Linda University)	Tentative parcel map and Development Permit to construct a 3-story, 150,000 square foot medical and educational facility	3	6/5/2014	Approved by Planning Commission on 9/17/14	Building Permit issued 1/19/15 Site Under Construction	Oliver Mujica
CUP14-10	NW corner 9th Street and Valencia Avenue - 950 Valencia Avenue (National Core)	Construct an affordable 76-unit multi-family housing project in two buildings with on-site amenities including a 2,200-square foot clubhouse community building and a 1,000-sq. ft. laundry/maintenance facility.	1	3/19/2014	Approved by Planning Commission on 5/21/14	Building Permits issued 12/1/2014 Site Under Construction	Oliver Mujica
CUP14-13	1241 W. 5th Street	Construct a 6,365-sq. ft. restaurant and night club with an ABC Type 48 License	1	6/12/2014	Approved by Planning Commission on 10/21/15	Building Plan Check Submitted on 05/17/16 Grading Plan Check Submitted on 04/12/16	Oliver Mujica
CUP14-14	524 S. Inland Center Drive Carl's Jr.	Demolition and reconstruction of new 2,999-sq. ft. drive thru restaurant <i>Cells replains existing</i>	3	6/23/2014	Approved by Planning Commission on 4/15/15	Building Plans Approved Grading Plan Check Submitted	Oliver Mujica
CUP14-19	3909 N. Hallmark Parkway	550-sq. ft. expansion of an existing convenience store and construction of a 3,000-square foot self service car wash facility	6	7/31/2014	Approved by Planning Commission on 7/15/15	Building Plan Check Submitted on 9/15/15	Travis Martin
CUP14-20	768 N. Waterman Avenue	Construct a new holistic learning center <i>4.4 + 11.86675F = 16.2666</i>	1	9/4/2014	Approved by Planning Commission on 01/20/16	Building Plan Check Submitted on 09/04/14	Oliver Mujica
CUP14-21	4690 N. Hallmark Parkway	Establishing a church in an existing 121,000-sq. ft. building	6	9/29/2014	Approved by Planning Commission on 3/18/15	Building Permit issued 8/31/15 Site Under Construction	Travis Martin
CUP14-22	4747 N. State Street	installing 3 modular buildings at an existing church <i>156</i>	5	10/6/2014	Approved by Planning Commission on 1/21/15	Building Permit issued 4/16/15 Site Under Construction	Travis Martin

City of San Bernardino
 Community Development Department - Major Projects List
 (Updated June 8, 2016)

File Name	Address (Project Name)	Project Summary	City Council Ward	Date Application Submitted	Application Status	Building Permit Status	Staff Contact
CUP15-24	975 E. Norman Road	Establish a truck storage yard	3	12/18/2014	Pending Re-Submission from Applicant	Pending Planning Commission Consideration	Travis Martin
CUP15-01	202 N. Mt. Vernon	Expand and existing self-service car wash	3	1/27/2015	Pending Re-Submission from Applicant	Pending Planning Commission Consideration	Travis Martin
CUP15-02	NW corner of Waterman and 5th Street - 510 N. Waterman Avenue	Proposed gas station with a convenience store with an off-sale alcoholic beverage license (ABC Type 20 license)	1	2/27/2015	Approved by Planning Commission on 4/15/15	Building Plan Check Submitted on 03/10/16	Oliver Mujica
CUP15-03	NE corner of Kendall Drive and Palm Avenue 0261-191-07-0000	Proposed two restaurants with drive-thru with an on-sale alcoholic beverage license (ABC Type 40 license)	5	2/18/2015	Approved by Planning Commission on 11/18/15	Pending Building Plan Check-Submittal	Travis Martin
CUP 15-04	2424 W. Kendall Drive	Request to expand existing day care facility from 69 children to 137 children on a 1.45 acre site <i>DISTANCE</i>	3	3/5/2015	Approved by Planning Commission on 5/16/15	Building Plan Check Approved 4/26/16 Pending Building Permit Issuance	Travis Martin
CUP15-06	255 E. Caroline Street (Big Country)	Proposed family dining restaurant with live entertainment saloon venue with an on-sale alcoholic beverage license (ABC Type 47 License)	3	4/22/2015	Pending Submittal of Environmental Documents and Development Agreement Under Review and Negotiations	Pending Planning Commission Consideration	Oliver Mujica
CUP15-07	655 W. 2nd Street (Hardy Brown K-8 School)	Proposed Hardy Brown School to house students in primary learning grades K-8. <i>DISTANCE</i>	1	5/4/2015	Approved by Planning Commission on 9/16/15	Temporary Certificate of Occupancy issued on 2/26/16	Oliver Mujica
CUP15-09	Artesian Avenue (North of Walnut Avenue)	Construction of a men's transitional housing facility with supportive services <i>11 AC</i>	3	6/11/2015	Scheduled for Mayor and Council on 07/05/16	Pending Consideration by Mayor and Common Council	Oliver Mujica
CUP15-10	1480 S. "E" Street	Establishment of a banquet hall within an existing retail center <i>12,000 SF</i>	3	6/11/2015	Approved by Planning Commission on 09/16/15	Building Plan Check Submitted on 11/09/15	Chantal Power
CUP15-12	1155 E. Gould Street	Construction of 2,800 square foot restaurant with drive-thru	3	6/24/2015	Approved by Planning Commission on 02/17/16	Pending Building Plan Check Submittal	Travis Martin
CUP15-13	1925 College Ave NW corner of University Parkway and State Street	Construction of commercial building with drive-thru <i>DISTANCE</i>	5	7/1/2015	Approved by Mayor & Common Council on 03/07/16	Building Plan Check Submitted 4/12/16	Oliver Mujica
CUP15-14	NE corner of 5th Street & Waterman Avenue	5,542 sq. ft. convenience store/donut shop w/ drive-thru, and gas station. Related applications: PCN15-04, TH15-128.	1	7/30/2015	Approved by Planning Commission on 01/20/16	Pending Building Plan Check-Submittal	Oliver Mujica
CUP15-17	1146 E. Highland Avenue	Charter School <i>6,832 SF</i>	7	10/19/2015	Approved by Planning Commission on 2/27/16	Building Plan Check Approved 4/21/16 Pending Building Permit Issuance	Chantal Power
CUP15-18	4120 E. Highland Avenue	Commercial Building with Drive-Thru <i>DISTANCE</i>	4	11/5/2015	Approved by Planning Commission on 04/20/16	Building Plan Check Submitted on 3/10/16	Travis Martin

City of San Bernardino
Community Development Department - Major Projects List
(Updated June 8, 2016)

File Name	Address (Project Name)	Project Summary	City Council Ward	Date Application Submitted	Application Status	Building Permit Status	Staff Contact
CUP15-19 <i>22</i>	2772 N. Sterling Avenue Aquinas Catholic High School	New performing arts building, administration building, gymnasium lobby and aquatic center for existing high school.	26 <i>26</i>	11/12/2015	Approved by Planning Commission on 2/17/16	Building Plan Check Submitted 4/5/16	Chantal Power
CUP15-20 <i>3</i>	3972 N. Waterman Avenue	Request to allow a conversion of an existing office building to develop, establish and operate a hotel containing approx. 9,796 sqft on a parcel containing approx. 32,240 sqft	4	12/22/2015	Pending Re-Submittal from Applicant	Pending Planning Commission Consideration	Chantal Power
CUP16-02 <i>24</i>	2114 W. Highland Avenue	Request to allow the development, establishment and operation of a service station with eight (8) pump islands, a convenience store with a type 20 alcohol license containing approx. 3,800 sqft, a retail/food suite containing approx. 2,000 sqft, and a drive thru car wash containing approx. 2,800 sqft.	6	1/20/2016	Scheduled for D/ERC on 06/16/16	Pending Planning Commission Consideration	Chantal Power
CUP16-03 DCA16-02 <i>34</i>	1630 S. "E" Street	A request to allow the development, establishment and operation of a freeway oriented electronic message center sign that is approx. 50ft in height and is two-sided with a 14' x 48' display.	3	2/4/2016	Scheduled for Mayor and Common Council on 07/05/16	Pending Consideration by Mayor and Common Council	Oliver Mujica
CUP16-04 <i>35</i>	North side of Kendall Drive, West of Campus Parkway	A request to allow the development, establishment and operation of a religious facility	5	2/9/2016	Approved by Planning Commission on 05/10/2016	Pending Building Plan Check Submittal	Elizabeth More
CUP16-06 <i>36</i>	115 S. "E" Street	A request to allow the establishment and operation of a sobering center	3	3/1/2016	Pending Meeting w/Police Department	Pending Planning Commission Consideration	Chantal Power
CUP16-08 <i>37</i>	180 E. Baseline Ave	A request to allow the re-establishment and operation of a used car dealership and auto repair	2	4/13/2016	Scheduled for Planning Commission on 06/15/16	Pending Planning Commission Consideration	Chantal Power
CUP16-09 <i>38</i>	165 E. Mill St.	A request to allow the establishment and operation of a truck repair facility	3	5/4/2016	Scheduled for D/ERC on 06/15/16	Pending Planning Commission Consideration	Chantal Power
DP-014-17 <i>39</i>	SE corner of Waterman Avenue & Hospitality Lane (Golden Corral) 325 E. Hospitality Lane	Construct an 11,300-sq ft. Golden Corral restaurant	3	6/5/2014	Approved by D/ERC on 12/14/14	Building Permits issued on 4/21/16	Trevi Martin
DP-014-20, TFM 15579 GPA-14-08, ZMA-14-16 <i>40</i>	255 S. Waterman Avenue (Hillwood Investments)	General Plan Amendment and Zone Map Amendment to construct a 427,000-sq ft. warehouse building	1	8/25/2014	Approved by Mayor and Common Council on 2/17/15	Building Permits issued on 12/29/15	Oliver Mujica

City of San Bernardino
Community Development Department - Major Projects List
(Updated June 8, 2016)

File Name	Address (Project Name)	Project Summary	City Council Ward	Date Application Submitted	Application Status	Building Permit Status	Staff Contact
DP-D15-02 43	2705 W. Leighton Way	Construct a 155,000-square foot warehouse facility	6	3/3/2015	Approved by D/ERC on 2/1/2016	Building Plan Check Submitted on 4/21/16	Oliver Mujica
DP-D15-04 44	1330 N. Lassen Street	Shipping container storage facility on three parcels totaling approximately 6.1 acres	6	7/9/2015	Approved by D/ERC on 8/27/15	Onsite/Offsite Landscaping Issued on 2/22/16	Oliver Mujica
DP-D15-05 45	2228 Artesia Street	Establishment of truck storage yard 3,284 SF	3	7/29/2015	Approved by D/ERC on 12/03/15	Pending Building Plan Check Submittal	Oliver Mujica
DP-D15-06 46	350 E. Mill Street	Construction of two (2) industrial buildings (202,295 sf and 177,575 sf)	1	8/5/2015	Approved by D/ERC on 9/24/15	Building Plan Check Submitted on 11/23/15 Demo Permit issued 05/01/16	Chantal Power
DP-D15-07 47	356 S. Allen Street	Establishment of truck storage yard	1	3/26/2015	Approved by D/ERC 11/05/15	Pending Building Plan Check Submittal	Chantal Power
DP-D15-08 48	N/E corner of Fairway Drive and Auto Center Drive	Establishment of truck storage yard and a 2,000sqft office building	3	9/30/2015	Approved by D/ERC 11/05/15	Pending Building Plan Check Submittal	Chantal Power
DP-D15-09 49	N/W corner of Central Avenue and Valley View Avenue	Construction of 154,560 square foot industrial building on 7.8 acres	1	9/30/2015	Approved by D/ERC on 2/1/2016	Pending Building Plan Check Submittal Demo Permit issued on 3/15/16	Travis Martin
DP-D15-10 50	765 W. Showcase Drive North	Expansion and renovation of Toyota of San Bernardino 510	3	9/30/2015	Pending Re-Submittal from Applicant	Pending Planning Division Approval	Travis Martin
DP-D15-11 51	152 E. Cub Center Drive	Develop, establish and operate a three story office building approx. 153,077 sqft and the	3	12/10/2015	Approved by D/ERC on 3/24/2016	Building Plan Check Submitted on 04/04/16 Grading Plan Check Submitted on 05/01/16	Travis Martin
DP-D15-13 52	West of Lena Road between Orange Show Road & Norman Road	Request to develop, establish, and operate an industrial building containing approx. 337,000 sqft, and the required landscaping and off-street parking improvements on a vacant parcel	1	12/22/2015	Scheduled for D/ERC on 06/16/16	Pending D/ERC Approval	Travis Martin
DP-D15-14 53	270 Central Avenue	A request to allow the development, establishment and operation of an industrial building containing approx. 127,327sqft	3	12/28/2015	Approved by Planning Division on 05/05/2016	Pending Building Plan Check Submittal	Chantal Power
DP-D15-01 54	East side of Waterman Avenue between 5th Street and 6th Street	A request to allow the development, establishment and operation of a ground mounted solar facility on a vacant parcel approx. 5.2 Acres NT	2	2/2/2016	Re-Submittal Under Review	Pending D/ERC Approval	Travis Martin
DP-D15-02 55	North of 6th Street and East of Waterman Avenue	A request to allow the development, establishment and operation of a ground mounted solar facility on a vacant parcel approx. 16.5 Acres NT	2	2/2/2016	Re-Submittal Under Review	Pending D/ERC Approval	Travis Martin

City of San Bernardino
Community Development Department - Major Projects List
(Updated June 8, 2016)

File Name	Address (Project Name)	Project Summary	City Council Ward	Date Application Submitted	Application Status	Building Permit Status	Staff Contact
DP-D16-03 <i>SA</i>	4992 N. Hallmark Parkway	A request to allow the development, establishment and operation of an industrial building containing approx. 340,080sqft.	6	7/15/2015	Approved by D/ERC on 05/19/2016	Pending Building Plan Check Submittal	Chantal Power
DP-D16-04 <i>MA</i>	200 S. Lens Road	A request to allow the development, establishment and operation of a pallet yard, and the required landscaping and off-street parking improvements.	1	2/25/2016	Approved by D/ERC on 04/23/2016	Pending Building Plan Check Submittal	Chantal Power
DP-D16-06 <i>GA</i>	1895 N. Del Rosa Avenue	A request to allow the expansion of an existing commercial building containing approx. 24,000 sqft to approx. 44,150 sqft, and the required landscaping and off-street parking improvements.	7	2/25/2016	Approved by D/ERC on 04/21/2016	Building Plan Check Submitted on 05/16/16	Chantal Power
DP-D16-07 <i>GA</i>	4404 University Parkway LA FITNESS	A request to allow the construction of a building containing approx. 32,000 sqft, and the required landscaping and off-street parking improvements.	6	3/9/2016	Scheduled for D/ERC on 07/14/16	Pending D/ERC Approval	Travis Martin
DP-D16-08 <i>AP</i>	1333 S. Tippecanoe Avenue	A request to allow the development, establishment and operation of two (2) buildings, and the required landscaping and off-street parking improvements.	1	5/3/2016	Pending Re-Submittal from Applicant	Pending D/ERC Approval	Chantal Power
DP-D16-10 <i>SA</i>	S. Auto Plaza Drive	A request to allow the development, establishment and operation of a truck trailer storage facility.	3	5/5/2016	Scheduled for D/ERC on 05/16/16	Pending D/ERC Approval	Chantal Power
DP-D16-11 <i>SA</i>	SW Corner Saratoga Way & Gerogia Boulevard	A request to allow the development, establishment and operation of an industrial building containing approx. 153,010sqft, and the required landscaping and off-street parking improvements.	6	5/17/2016	New Application Under Review	Pending D/ERC Approval	Chantal Power
DP-D14-06 <i>SA</i>	216 E. Baseline Street	Construct a 5,200-sq ft. multi-tenent commercial building.	2	10/1/2014	Revised Submittal Under Review	Pending Planning Commission Consideration	Travis Martin
DP-D14-07 <i>SA</i>	Hilcrest Avenue and Colton Avenue	Parcel map to construct 86-unit senior housing project.	3	10/1/2014	Approved at Planning Commission on 12/16/15	Pending Building Plan Check Submittal	Oliver Mujica
DP-D14-08 <i>SA</i>	2226 W. Foothill Boulevard	Construct 43 condominium townhomes.	6	10/9/2014	Approved by Planning Commission on 1/20/16	Pending Building Plan Check Submittal	Oliver Mujica
DP-D15-03 <i>SA</i>	957 W. Reese Street	Establishment of truck storage yard.	1	8/13/2015	Approved by Planning Commission on 04/20/2016	Pending Building Plan Check Submittal	Oliver Mujica
DP-D15-04 <i>SA</i>	895 S. Inland Center Drive	Develop, establish and operate an industrial building approx. 14,857sqft.	3	10/29/2015	Approved at Planning Commission on 12/16/15	Building Plan Check Submitted on 2/18/16	Travis Martin

City of San Bernardino
 Community Development Department - Major Projects List
 (Updated June 8, 2016)

File Name	Address (Project Name)	Project Summary	City Council Ward	Date Application Submitted	Application Status	Building Permit Status	Staff Contact
DP-P16-01 <i>66</i>	North side of Little League Dr. West of Palm Avenue	A request to allow development, establishment and operation of the Rancho Palm Specific Plan/Environmental Impact Report on a parcel containing approx. 38.1 acres	5	2/17/2016	Pending End of CEQA NOP Review Period	Pending Planning Commission Consideration	Chantal Power
DP-P16-02 <i>64</i>	SR Corner of Belmont Avenue & Olive Avenue	A request to construct to construct fourteen (14) single family residences	5	4/18/2016	Scheduled for D/ERC on 06/16/16	Pending Planning Commission Consideration	Elizabeth Mora-Rodriguez
DP-P16-03 <i>70</i>	2935 W. Belmont Avenue	A request to construct to construct sixteen (16) single family residences	5	4/21/2016	Scheduled for D/ERC on 06/16/16	Pending Planning Commission Consideration	Elizabeth Mora-Rodriguez
DCA14-18 <i>71</i>	6th Street west of McKinley Street	Change the existing zoning of 20.58 acres from multi-family residential to industrial light	1	11/19/2014	Pending Submittal of CEQA Document	Pending Mayor and Common Council Approval	Oliver Mujica
DEA15-04 <i>72</i>	SW corner of Waterman Avenue and Dumas Street	Change zoning of a 25.25 acre site from Industrial Light (IL), Office Industrial Park (OIP), and PCR to Industrial Light (IL)	3	11/12/2016	Scheduled for Mayor and Common Council on 07/20/2016	Pending Mayor and Common Council Approval	Travis Martin
SP-15-01 <i>73</i>	Waterman+Baseline Neighborhood <i>Waterman neighborhood</i>	Specific Plan for Waterman Avenue and Baseline Street neighborhoods <i>41 Multifamily Dots +</i>	1 and 2	9/15/2015 <i>1/4/16</i>	Administrative Draft Specific Plan and EIR under review <i>Community Center</i>	Pending Mayor and Common Council Consideration	Oliver Mujica
VAR16-01 <i>74</i>	584 W. Caroline Street	Request to allow the construction of sixteen (16) foot high wall to exceed permitted height of ten (10) feet for an existing multi-tenant industrial development <i>IL</i>	3	2/22/2016	Approved by Planning Commission on 04/20/2016	Pending Building Plan Check Consideration	Chantal Power

APPENDIX 4.2:
POST PROCESSING WORKSHEETS

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Project: Gateway South Building 4
 Scenario: Horizon Year Without Project

Job #: 10187
 Analyst: BA
 Date: 3/15/17

LOCATION: I-215 Southbound Ramps / Auto Center Rd.
 FORECAST YEAR: 2035

INDIVIDUAL TURN VOLUME GROWTH REVIEW									
APPROACH	TURNING MOVEMENT	AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
		EXISTING COUNT	FUTURE VOLUME	DIFFERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFFERENCE	% CHANGE
NORTH BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	NB Total	0	0	0	#DIV/0!	0	0	0	#DIV/0!
SOUTH BOUND	Left	1,037	1,249	213	21%	554	630	76	14%
	Through	66	70	5	7%	101	146	45	45%
	Right	344	341	-3	-1%	268	211	-57	-21%
	SB Total	1,446	1,660	215	15%	923	987	65	7%
EAST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	132	180	48	36%	438	410	-28	-6%
	Right	33	40	7	21%	174	207	33	19%
	EB Total	165	220	55	33%	612	617	5	1%
WEST BOUND	Left	1	1	0	0%	8	17	9	113%
	Through	188	166	-22	-12%	318	379	62	19%
	Right	247	284	38	15%	617	780	163	26%
	WB Total	436	451	16	4%	943	1,176	234	25%
TOTAL ENTERING VOLUME		2,046	2,331	285	14%	2,477	2,780	303	12%

FORECAST PEAK HOUR TO ADT COMPARISON						
		VOLUMES		PERCENT OF ADT		ADT
		AM	PM	AM	PM	
North Leg	Inbound	1,660	987			
North Leg	Outbound	284	780			
North Leg	TOTAL	1,944	1,767	18%	17%	10,647
South Leg	Inbound	0	0			
South Leg	Outbound	111	370			
South Leg	TOTAL	111	370	5%	18%	2,079
East Leg	Inbound	451	1,176			
East Leg	Outbound	1,429	1,040			
East Leg	TOTAL	1,880	2,216	14%	16%	13,876
West Leg	Inbound	220	617			
West Leg	Outbound	507	590			
West Leg	TOTAL	727	1,207	12%	20%	6,135
OVERALL TOTAL		4,662	5,560	14%	17%	32,737

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Project: Gateway South Building 4
 Scenario: Horizon Year Without Project

Job #: 10187
 Analyst: BA
 Date: 3/15/17

LOCATION: I-215 Northbound Ramps / Auto Center Rd.
 FORECAST YEAR: 2035

INDIVIDUAL TURN VOLUME GROWTH REVIEW									
APPROACH	TURNING MOVEMENT	AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
		EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	140	112	-28	-20%	116	88	-28	-24%
	Through	8	4	-4	-50%	7	3	-4	-57%
	Right	840	589	-251	-30%	905	745	-160	-18%
	NB Total	988	705	-283	-29%	1,028	836	-192	-19%
SOUTH BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	SB Total	0	0	0	#DIV/0!	0	0	0	#DIV/0!
EAST BOUND	Left	69	60	-9	-13%	222	124	-98	-44%
	Through	1,100	1,361	262	24%	770	935	165	21%
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	EB Total	1,169	1,421	253	22%	992	1,059	67	7%
WEST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	296	338	43	14%	827	1,102	276	33%
	Right	249	176	-73	-29%	634	423	-211	-33%
	WB Total	545	514	-31	-6%	1,461	1,525	65	4%
TOTAL ENTERING VOLUME		2,701	2,640	-61	-2%	3,481	3,420	-61	-2%

FORECAST PEAK HOUR TO ADT COMPARISON						
		VOLUMES		PERCENT OF ADT		ADT
		AM	PM	AM	PM	
North Leg	Inbound	0	0			
North Leg	Outbound	240	550			
North Leg	TOTAL	240	550	5%	11%	5,000
South Leg	Inbound	705	836			
South Leg	Outbound	0	0			
South Leg	TOTAL	705	836	14%	17%	5,000
East Leg	Inbound	514	1,525			
East Leg	Outbound	1,950	1,680			
East Leg	TOTAL	2,464	3,205	18%	23%	13,876
West Leg	Inbound	1,421	1,059			
West Leg	Outbound	450	1,190			
West Leg	TOTAL	1,871	2,249	13%	16%	13,876
OVERALL TOTAL		5,280	6,840	14%	18%	37,752

U:\UcJobs_10100-10500_10100\10187\Post Processing\[02 I-215 NB_Orange Show.xls]Output (3)

Project: Gateway South Building 4
 Scenario: Horizon Year Without Project

Job #: 10187
 Analyst: BA
 Date: 3/15/17

LOCATION: E Street / Orange Show Road
 FORECAST YEAR: 2035

INDIVIDUAL TURN VOLUME GROWTH REVIEW									
APPROACH	TURNING MOVEMENT	AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
		EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	162	142	-20	-12%	307	258	-49	-16%
	Through	168	153	-15	-9%	374	449	75	20%
	Right	113	124	12	10%	141	132	-9	-6%
	NB Total	442	419	-23	-5%	822	839	17	2%
SOUTH BOUND	Left	42	54	12	29%	220	251	31	14%
	Through	126	182	57	45%	260	293	33	13%
	Right	42	43	1	2%	250	256	6	2%
	SB Total	210	279	70	33%	730	800	70	10%
EAST BOUND	Left	215	177	-38	-17%	230	285	55	24%
	Through	1,206	1,201	-5	0%	1,093	1,057	-36	-3%
	Right	460	513	53	12%	344	328	-16	-5%
	EB Total	1,881	1,891	11	1%	1,667	1,670	4	0%
WEST BOUND	Left	59	80	22	37%	146	179	34	23%
	Through	338	328	-10	-3%	826	925	99	12%
	Right	61	62	1	2%	122	195	73	60%
	WB Total	457	470	13	3%	1,094	1,299	206	19%
TOTAL ENTERING VOLUME		2,989	3,059	70	2%	4,312	4,608	296	7%

FORECAST PEAK HOUR TO ADT COMPARISON						
		VOLUMES		PERCENT OF ADT		ADT
		AM	PM	AM	PM	
North Leg	Inbound	279	800			
North Leg	Outbound	392	929			
North Leg	TOTAL	671	1,729	8%	20%	8,676
South Leg	Inbound	419	839			
South Leg	Outbound	775	800			
South Leg	TOTAL	1,194	1,639	20%	27%	5,993
East Leg	Inbound	470	1,299			
East Leg	Outbound	1,379	1,440			
East Leg	TOTAL	1,849	2,739	16%	24%	11,264
West Leg	Inbound	1,891	1,670			
West Leg	Outbound	513	1,439			
West Leg	TOTAL	2,404	3,109	17%	22%	13,876
OVERALL TOTAL		6,118	9,216	15%	23%	39,809

U:\UcJobs_10100-10500_10100\10187\Post Processing\[03 E_Orange Show.xls]Output (3)

Project: Gateway South Building 4
 Scenario: Horizon Year Without Project

Job #: 10187
 Analyst: BA
 Date: 3/15/17

LOCATION: Arrowhead Avenue / Orange Show Road
 FORECAST YEAR: 2035

INDIVIDUAL TURN VOLUME GROWTH REVIEW									
APPROACH	TURNING MOVEMENT	AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
		EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	0	0	0	#DIV/0!	20	22	2	10%
	Through	3	3	0	0%	9	10	1	11%
	Right	5	7	2	40%	37	38	1	3%
	NB Total	8	10	2	25%	66	70	4	6%
SOUTH BOUND	Left	86	101	15	17%	183	201	18	10%
	Through	11	13	2	18%	2	3	1	50%
	Right	192	205	14	7%	481	577	96	20%
	SB Total	289	319	31	11%	666	781	115	17%
EAST BOUND	Left	286	244	-42	-15%	288	318	30	10%
	Through	984	1,048	65	7%	1,003	1,006	3	0%
	Right	17	19	2	12%	4	5	1	25%
	EB Total	1,286	1,311	25	2%	1,295	1,329	34	3%
WEST BOUND	Left	7	8	1	14%	10	13	3	30%
	Through	290	288	-2	-1%	626	705	79	13%
	Right	84	74	-10	-12%	135	153	18	13%
	WB Total	381	370	-11	-3%	771	871	100	13%
TOTAL ENTERING VOLUME		1,963	2,010	47	2%	2,798	3,051	253	9%

FORECAST PEAK HOUR TO ADT COMPARISON						
		VOLUMES		PERCENT OF ADT		ADT
		AM	PM	AM	PM	
North Leg	Inbound	319	781			
North Leg	Outbound	321	481			
North Leg	TOTAL	640	1,262	13%	26%	4,915
South Leg	Inbound	10	70			
South Leg	Outbound	40	21			
South Leg	TOTAL	50	91	#DIV/0!	#DIV/0!	-
East Leg	Inbound	370	871			
East Leg	Outbound	1,156	1,245			
East Leg	TOTAL	1,526	2,116	23%	32%	6,618
West Leg	Inbound	1,311	1,329			
West Leg	Outbound	493	1,304			
West Leg	TOTAL	1,804	2,633	19%	27%	9,579
OVERALL TOTAL		4,020	6,102	19%	29%	21,112

U:\UcJobs_10100-10500_10100\10187\Post Processing\[04 Arrowhead_Orange Show.xls]Output (3)

Project: Gateway South Building 4
 Scenario: Horizon Year Without Project

Job #: 10187
 Analyst: BA
 Date: 3/15/17

LOCATION: Washington Avenue / Orange Show Road
 FORECAST YEAR: 2035

INDIVIDUAL TURN VOLUME GROWTH REVIEW									
APPROACH	TURNING MOVEMENT	AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
		EXISTING COUNT	FUTURE VOLUME	DIFFERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFFERENCE	% CHANGE
NORTH BOUND	Left	6	6	0	0%	15	29	14	93%
	Through	3	4	1	33%	2	3	1	50%
	Right	0	0	0	#DIV/0!	5	9	4	80%
	NB Total	9	10	1	11%	22	41	19	86%
SOUTH BOUND	Left	3	3	0	0%	1	1	0	0%
	Through	1	2	1	100%	1	1	0	0%
	Right	7	5	-2	-29%	11	9	-2	-18%
	SB Total	11	10	-1	-9%	13	11	-2	-15%
EAST BOUND	Left	49	44	-5	-10%	33	30	-3	-9%
	Through	1,022	1,111	89	9%	1,217	1,251	34	3%
	Right	8	14	6	75%	11	14	3	27%
	EB Total	1,079	1,169	90	8%	1,261	1,295	34	3%
WEST BOUND	Left	2	4	2	100%	4	5	1	25%
	Through	371	363	-8	-2%	730	822	93	13%
	Right	12	13	1	8%	8	7	-1	-13%
	WB Total	385	380	-5	-1%	742	834	93	12%
TOTAL ENTERING VOLUME		1,484	1,569	85.5	6%	2,038	2,181	144	7%

FORECAST PEAK HOUR TO ADT COMPARISON						
		VOLUMES		PERCENT OF ADT		ADT
		AM	PM	AM	PM	
North Leg	Inbound	10	11			
North Leg	Outbound	61	40			
North Leg	TOTAL	71	51	#DIV/0!	#DIV/0!	-
South Leg	Inbound	10	41			
South Leg	Outbound	20	20			
South Leg	TOTAL	30	61	2%	4%	1,581
East Leg	Inbound	380	834			
East Leg	Outbound	1,114	1,261			
East Leg	TOTAL	1,494	2,095	27%	38%	5,470
West Leg	Inbound	1,169	1,295			
West Leg	Outbound	374	860			
West Leg	TOTAL	1,543	2,155	23%	33%	6,618
OVERALL TOTAL		3,138	4,362	23%	32%	13,669

U:\UcJobs_10100-10500_10100\10187\Post Processing\[05 Washington_Orange Show.xls]Output (3)

Project: Gateway South Building 4
 Scenario: Horizon Year Without Project

Job #: 10187
 Analyst: BA
 Date: 3/15/17

LOCATION: I-10 Eastbound Off-Ramp / E. Redlands Boulevard
 FORECAST YEAR: 2035

INDIVIDUAL TURN VOLUME GROWTH REVIEW									
APPROACH	TURNING MOVEMENT	AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
		EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	23	20	-3	-11%	62	60	-2	-3%
	NB Total	23	20	-3	-11%	62	60	-2	-3%
SOUTH BOUND	Left	580	763	184	32%	501	609	109	22%
	Through	304	304	0	0%	123	120	-3	-2%
	Right	615	583	-32	-5%	379	401	23	6%
	SB Total	1,498	1,650	152	10%	1,002	1,130	128	13%
EAST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	450	542	92	20%	632	696	64	10%
	Right	31	28	-3	-10%	17	15	-2	-12%
	EB Total	481	570	89	19%	649	711	62	10%
WEST BOUND	Left	35	39	4	11%	21	26	5	24%
	Through	411	431	20	5%	565	753	189	33%
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	WB Total	446	470	24	5%	586	779	194	33%
TOTAL ENTERING VOLUME		2,448	2,710	262.5	11%	2,299	2,680	382	17%

FORECAST PEAK HOUR TO ADT COMPARISON						
		VOLUMES		PERCENT OF ADT		ADT
		AM	PM	AM	PM	
North Leg	Inbound	1,650	1,130			
North Leg	Outbound	0	0			
North Leg	TOTAL	1,650	1,130	11%	8%	14,397
South Leg	Inbound	20	60			
South Leg	Outbound	371	161			
South Leg	TOTAL	391	221	#DIV/0!	#DIV/0!	-
East Leg	Inbound	470	779			
East Leg	Outbound	1,325	1,365			
East Leg	TOTAL	1,795	2,144	8%	9%	23,592
West Leg	Inbound	570	711			
West Leg	Outbound	1,014	1,154			
West Leg	TOTAL	1,584	1,865	13%	15%	12,649
OVERALL TOTAL		5,420	5,360	11%	11%	50,638

U:\UcJobs_10100-10500_10100\10187\Post Processing\[08 I-10 EB_Redlands.xls]Output (3)

Project: Gateway South Building 4
 Scenario: Horizon Year Without Project

Job #: 10187
 Analyst: BA
 Date: 3/15/17

LOCATION: Waterman Avenue / Orange Show Road
 FORECAST YEAR: 2035

INDIVIDUAL TURN VOLUME GROWTH REVIEW									
APPROACH	TURNING MOVEMENT	AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
		EXISTING COUNT	FUTURE VOLUME	DIFFERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFFERENCE	% CHANGE
NORTH BOUND	Left	55	58	4	6%	208	227	20	9%
	Through	469	559	91	19%	721	920	199	28%
	Right	62	72	10	16%	130	143	13	10%
	NB Total	585	689	104	18%	1,059	1,290	232	22%
SOUTH BOUND	Left	72	86	14	19%	139	158	19	14%
	Through	565	754	190	34%	752	868	116	15%
	Right	64	70	6	9%	118	133	15	13%
	SB Total	701	910	210	30%	1,009	1,159	150	15%
EAST BOUND	Left	169	178	9	5%	168	196	28	17%
	Through	518	531	13	3%	855	862	7	1%
	Right	325	371	47	14%	217	222	6	3%
	EB Total	1,012	1,080	69	7%	1,240	1,280	41	3%
WEST BOUND	Left	95	115	21	22%	75	83	8	11%
	Through	274	272	-2	-1%	445	481	36	8%
	Right	84	93	10	11%	84	106	22	26%
	WB Total	452	480	28	6%	604	670	66	11%
TOTAL ENTERING VOLUME		2,749	3,159	410	15%	3,911	4,399	488	12%

FORECAST PEAK HOUR TO ADT COMPARISON						
		VOLUMES		PERCENT OF ADT		ADT
		AM	PM	AM	PM	
North Leg	Inbound	910	1,159			
North Leg	Outbound	830	1,222			
North Leg	TOTAL	1,740	2,381	8%	10%	23,165
South Leg	Inbound	689	1,290			
South Leg	Outbound	1,240	1,173			
South Leg	TOTAL	1,929	2,463	8%	11%	23,217
East Leg	Inbound	480	670			
East Leg	Outbound	689	1,163			
East Leg	TOTAL	1,169	1,833	23%	37%	4,988
West Leg	Inbound	1,080	1,280			
West Leg	Outbound	400	841			
West Leg	TOTAL	1,480	2,121	27%	39%	5,470
OVERALL TOTAL		6,318	8,798	11%	15%	56,840

U:\UcJobs_10100-10500_10100\10187\Post Processing\[09 Waterman_Orange Show.xls]Output (3)

Project: Gateway South Building 4
 Scenario: Horizon Year Without Project

Job #: 10187
 Analyst: BA
 Date: 3/15/17

LOCATION: Waterman Avenue / Dumas Street
 FORECAST YEAR: 2035

INDIVIDUAL TURN VOLUME GROWTH REVIEW									
APPROACH	TURNING MOVEMENT	AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
		EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	1	4	3	300%	9	15	6	67%
	Through	582	735	153	26%	1,057	1,289	233	22%
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	NB Total	583	739	156	27%	1,066	1,304	239	22%
SOUTH BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	1,022	1,324	303	30%	1,012	1,231	220	22%
	Right	8	17	9	113%	4	5	1	25%
	SB Total	1,030	1,341	312	30%	1,016	1,236	221	22%
EAST BOUND	Left	3	1	-2	-67%	2	1	-1	-50%
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	10	9	-1	-10%	11	9	-2	-18%
	EB Total	13	10	-3	-23%	13	10	-3	-23%
WEST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	WB Total	0	0	0	#DIV/0!	0	0	0	#DIV/0!
TOTAL ENTERING VOLUME		1,626	2,090	464.5	29%	2,094	2,550	456	22%

FORECAST PEAK HOUR TO ADT COMPARISON						
		VOLUMES		PERCENT OF ADT		ADT
		AM	PM	AM	PM	
North Leg	Inbound	1,341	1,236			
North Leg	Outbound	736	1,290			
North Leg	TOTAL	2,077	2,526	9%	11%	23,217
South Leg	Inbound	739	1,304			
South Leg	Outbound	1,333	1,240			
South Leg	TOTAL	2,072	2,544	8%	10%	24,666
East Leg	Inbound	0	0			
East Leg	Outbound	0	0			
East Leg	TOTAL	0	0	0%	0%	5,151
West Leg	Inbound	10	10			
West Leg	Outbound	21	20			
West Leg	TOTAL	31	30	2%	2%	1,914
OVERALL TOTAL		4,180	5,100	8%	9%	54,948

U:\UcJobs_10100-10500_10100\10187\Post Processing\[10 Waterman_Dumas.xls]Output (3)

Project: Gateway South Building 4
 Scenario: Horizon Year Without Project

Job #: 10187
 Analyst: BA
 Date: 3/15/17

LOCATION: Waterman Avenue / Hospitality Lane
 FORECAST YEAR: 2035

INDIVIDUAL TURN VOLUME GROWTH REVIEW									
APPROACH	TURNING MOVEMENT	AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
		EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	284	278	-6	-2%	265	299	35	13%
	Through	802	1,006	204	25%	449	622	173	39%
	Right	802	865	64	8%	687	809	122	18%
	NB Total	1,887	2,149	262	14%	1,401	1,730	330	24%
SOUTH BOUND	Left	90	101	11	12%	200	209	9	5%
	Through	436	615	179	41%	970	1,211	241	25%
	Right	142	144	3	2%	149	150	1	1%
	SB Total	668	860	193	29%	1,319	1,570	251	19%
EAST BOUND	Left	158	177	19	12%	168	177	9	5%
	Through	183	177	-6	-3%	383	342	-41	-11%
	Right	129	156	28	21%	554	591	37	7%
	EB Total	470	510	41	9%	1,105	1,110	6	0%
WEST BOUND	Left	359	461	103	29%	390	497	107	27%
	Through	399	370	-29	-7%	450	461	12	3%
	Right	67	79	13	19%	105	131	27	25%
	WB Total	824	910	87	11%	944	1,089	145	15%
TOTAL ENTERING VOLUME		3,848	4,429	581.5	15%	4,768	5,499	731	15%

FORECAST PEAK HOUR TO ADT COMPARISON						
		VOLUMES		PERCENT OF ADT		ADT
		AM	PM	AM	PM	
North Leg	Inbound	860	1,570			
North Leg	Outbound	1,262	930			
North Leg	TOTAL	2,122	2,500	10%	12%	20,385
South Leg	Inbound	2,149	1,730			
South Leg	Outbound	1,232	2,299			
South Leg	TOTAL	3,381	4,029	9%	11%	37,189
East Leg	Inbound	910	1,089			
East Leg	Outbound	1,143	1,360			
East Leg	TOTAL	2,053	2,449	17%	20%	12,147
West Leg	Inbound	510	1,110			
West Leg	Outbound	792	910			
West Leg	TOTAL	1,302	2,020	12%	19%	10,813
OVERALL TOTAL		8,858	10,998	11%	14%	80,534

U:\UcJobs_10100-10500_10100\10187\Post Processing\[12 Waterman_Hospitality.xls]Output (3)

Project: Gateway South Building 4
 Scenario: Horizon Year Without Project

Job #: 10187
 Analyst: BA
 Date: 3/15/17

LOCATION: Waterman Avenue / I-10 Westbound On-Ramp
 FORECAST YEAR: 2035

INDIVIDUAL TURN VOLUME GROWTH REVIEW									
APPROACH	TURNING MOVEMENT	AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
		EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	281	332	51	18%	347	561	214	62%
	Through	1,887	2,156	269	14%	1,424	1,757	334	23%
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	NB Total	2,168	2,488	320	15%	1,771	2,318	548	31%
SOUTH BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	772	1,073	301	39%	1,313	1,707	394	30%
	Right	154	180	27	17%	684	704	20	3%
	SB Total	926	1,253	328	35%	1,997	2,411	414	21%
EAST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	EB Total	0	0	0	#DIV/0!	0	0	0	#DIV/0!
WEST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	WB Total	0	0	0	#DIV/0!	0	0	0	#DIV/0!
TOTAL ENTERING VOLUME		3,094	3,741	647.5	21%	3,768	4,729	962	26%

FORECAST PEAK HOUR TO ADT COMPARISON						
		VOLUMES		PERCENT OF ADT		ADT
		AM	PM	AM	PM	
North Leg	Inbound	1,253	2,411			
North Leg	Outbound	2,156	1,757			
North Leg	TOTAL	3,409	4,168	9%	11%	37,189
South Leg	Inbound	2,488	2,318			
South Leg	Outbound	1,073	1,707			
South Leg	TOTAL	3,561	4,025	9%	10%	40,741
East Leg	Inbound	0	0			
East Leg	Outbound	0	0			
East Leg	TOTAL	0	0	#DIV/0!	#DIV/0!	-
West Leg	Inbound	0	0			
West Leg	Outbound	512	1,265			
West Leg	TOTAL	512	1,265	7%	19%	6,835
OVERALL TOTAL		7,482	9,458	9%	11%	84,765

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Project: Gateway South Building 4
 Scenario: Horizon Year Without Project

Job #: 10187
 Analyst: BA
 Date: 3/15/17

LOCATION: Waterman Avenue / I-10 Eastbound Ramps
 FORECAST YEAR: 2035

INDIVIDUAL TURN VOLUME GROWTH REVIEW									
APPROACH	TURNING MOVEMENT	AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
		EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	1,035	1,325	290	28%	1,130	1,583	453	40%
	Right	300	300	0	0%	418	466	48	11%
	NB Total	1,335	1,625	290	22%	1,548	2,049	501	32%
SOUTH BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	648	1,210	562	87%	908	1,287	379	42%
	Right	124	120	-4	-3%	441	496	55	12%
	SB Total	772	1,330	558	72%	1,349	1,783	434	32%
EAST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	EB Total	0	0	0	#DIV/0!	0	0	0	#DIV/0!
WEST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	1,133	1,175	42	4%	675	828	153	23%
	WB Total	1,133	1,175	42	4%	675	828	153	23%
TOTAL ENTERING VOLUME		3,240	4,130	890	27%	3,572	4,660	1088	30%

FORECAST PEAK HOUR TO ADT COMPARISON						
		VOLUMES		PERCENT OF ADT		ADT
		AM	PM	AM	PM	
North Leg	Inbound	1,330	1,783			
North Leg	Outbound	2,500	2,411			
North Leg	TOTAL	3,830	4,194	9%	10%	40,741
South Leg	Inbound	1,625	2,049			
South Leg	Outbound	1,210	1,287			
South Leg	TOTAL	2,835	3,336	6%	7%	44,581
East Leg	Inbound	1,175	828			
East Leg	Outbound	300	466			
East Leg	TOTAL	1,475	1,294	11%	10%	13,497
West Leg	Inbound	0	0			
West Leg	Outbound	120	496			
West Leg	TOTAL	120	496	38%	155%	319
OVERALL TOTAL		8,260	9,320	8%	9%	99,138

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Project: Gateway South Building 4
 Scenario: Horizon Year Without Project

Job #: 10187
 Analyst: BA
 Date: 3/15/17

LOCATION: Waterman Avenue / Redlands Boulevard
 FORECAST YEAR: 2035

INDIVIDUAL TURN VOLUME GROWTH REVIEW									
APPROACH	TURNING MOVEMENT	AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
		EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	39	22	-17	-44%	51	44	-7	-13%
	Through	760	976	216	28%	884	1,151	267	30%
	Right	110	177	67	61%	83	116	33	40%
	NB Total	909	1,175	266	29%	1,018	1,311	294	29%
SOUTH BOUND	Left	73	287	214	293%	201	400	199	99%
	Through	396	670	274	69%	519	636	117	23%
	Right	179	252	73	41%	188	233	45	24%
	SB Total	648	1,209	561	87%	908	1,269	361	40%
EAST BOUND	Left	471	599	128	27%	483	547	64	13%
	Through	367	586	219	60%	654	796	142	22%
	Right	233	160	-73	-31%	143	107	-36	-25%
	EB Total	1,071	1,345	274	26%	1,280	1,450	170	13%
WEST BOUND	Left	108	109	1	1%	169	239	70	41%
	Through	221	186	-35	-16%	353	504	152	43%
	Right	104	195	91	88%	181	386	205	113%
	WB Total	433	490	57	13%	703	1,129	427	61%
TOTAL ENTERING VOLUME		3,061	4,219	1158	38%	3,908	5,159	1251	32%

FORECAST PEAK HOUR TO ADT COMPARISON						
		VOLUMES		PERCENT OF ADT		ADT
		AM	PM	AM	PM	
North Leg	Inbound	1,209	1,269			
North Leg	Outbound	1,770	2,084			
North Leg	TOTAL	2,979	3,353	7%	8%	44,581
South Leg	Inbound	1,175	1,311			
South Leg	Outbound	939	982			
South Leg	TOTAL	2,114	2,293	6%	7%	33,661
East Leg	Inbound	490	1,129			
East Leg	Outbound	1,050	1,312			
East Leg	TOTAL	1,540	2,441	9%	14%	17,833
West Leg	Inbound	1,345	1,450			
West Leg	Outbound	460	781			
West Leg	TOTAL	1,805	2,231	8%	9%	23,592
OVERALL TOTAL		8,438	10,318	7%	9%	119,667

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Project: Gateway South Building 4
 Scenario: Horizon Year Without Project

Job #: 10187
 Analyst: BA
 Date: 3/15/17

LOCATION: I-10 Westbound Ramps / Hospitality Lane
 FORECAST YEAR: 2035

INDIVIDUAL TURN VOLUME GROWTH REVIEW									
APPROACH	TURNING MOVEMENT	AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
		EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	655	736	82	12%	329	431	103	31%
	Through	204	256	52	25%	73	93	20	27%
	Right	63	66	4	6%	72	80	8	11%
	NB Total	921	1,058	137	15%	474	604	131	28%
SOUTH BOUND	Left	15	15	0	0%	89	85	-4	-4%
	Through	84	121	37	44%	533	601	68	13%
	Right	35	38	3	9%	86	98	12	14%
	SB Total	134	174	40	30%	708	784	76	11%
EAST BOUND	Left	159	194	35	22%	115	137	22	19%
	Through	350	359	10	3%	805	835	30	4%
	Right	108	156	49	45%	234	284	51	22%
	EB Total	616	709	93	15%	1,154	1,256	103	9%
WEST BOUND	Left	84	113	30	35%	457	495	38	8%
	Through	202	206	5	2%	421	461	40	10%
	Right	26	30	4	15%	123	130	8	6%
	WB Total	311	349	38	12%	1,001	1,086	86	9%
TOTAL ENTERING VOLUME		1,982	2,290	308	16%	3,336	3,730	395	12%

FORECAST PEAK HOUR TO ADT COMPARISON						
		VOLUMES		PERCENT OF ADT		ADT
		AM	PM	AM	PM	
North Leg	Inbound	174	784			
North Leg	Outbound	480	360			
North Leg	TOTAL	654	1,144	6%	10%	11,006
South Leg	Inbound	1,058	604			
South Leg	Outbound	390	1,380			
South Leg	TOTAL	1,448	1,984	8%	11%	17,358
East Leg	Inbound	349	1,086			
East Leg	Outbound	440	1,000			
East Leg	TOTAL	789	2,086	8%	20%	10,286
West Leg	Inbound	709	1,256			
West Leg	Outbound	980	990			
West Leg	TOTAL	1,689	2,246	14%	19%	11,986
OVERALL TOTAL		4,580	7,460	9%	15%	50,636

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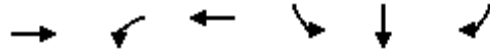
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APPENDIX 5.1:

E+P CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Timings
1: I-215 SB Ramps & Auto Center Rd.

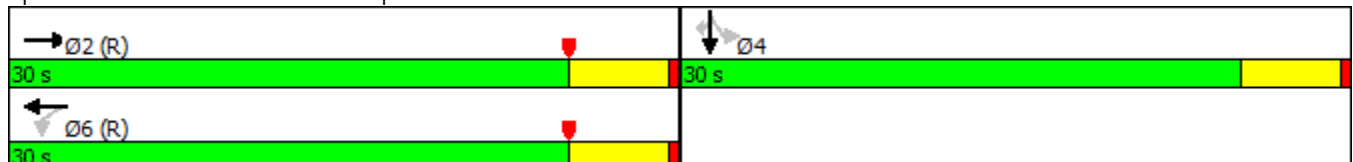


Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Configurations	↑↑		↑↑	↖	↖	↖
Traffic Volume (vph)	134	1	189	1061	66	344
Future Volume (vph)	134	1	189	1061	66	344
Turn Type	NA	Perm	NA	Perm	NA	Perm
Protected Phases	2		6		4	
Permitted Phases		6		4		4
Detector Phase	2	6	6	4	4	4
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	30.0	22.5	22.5	22.5	22.5	22.5
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0		5.0	5.0	5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	Max	Max	Max
Act Effct Green (s)	25.0		25.0	25.0	25.0	25.0
Actuated g/C Ratio	0.42		0.42	0.42	0.42	0.42
v/c Ratio	0.12		0.13	0.84	0.80	0.38
Control Delay	8.8		10.3	29.7	25.9	2.8
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	8.8		10.3	29.7	25.9	2.8
LOS	A		B	C	C	A
Approach Delay	8.8		10.3		22.0	
Approach LOS	A		B		C	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 2 (3%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.84
 Intersection Signal Delay: 19.5
 Intersection Capacity Utilization 47.9%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 1: I-215 SB Ramps & Auto Center Rd.



HCM Signalized Intersection Capacity Analysis
 1: I-215 SB Ramps & Auto Center Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑					↑	↑	↑
Traffic Volume (vph)	0	134	33	1	189	0	0	0	0	1061	66	344
Future Volume (vph)	0	134	33	1	189	0	0	0	0	1061	66	344
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		5.0			5.0					5.0	5.0	5.0
Lane Util. Factor		0.95			0.95					0.95	0.95	1.00
Frt		0.97			1.00					1.00	1.00	0.85
Flt Protected		1.00			1.00					0.95	0.96	1.00
Satd. Flow (prot)		3600			3600					1700	1800	1800
Flt Permitted		1.00			0.95					0.95	0.96	1.00
Satd. Flow (perm)		3600			3600					1700	1800	1800
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	143	35	1	201	0	0	0	0	1129	70	366
RTOR Reduction (vph)	0	20	0	0	0	0	0	0	0	0	0	214
Lane Group Flow (vph)	0	158	0	0	202	0	0	0	0	598	601	153
Turn Type		NA		Perm	NA					Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases				6						4		4
Actuated Green, G (s)		25.0			25.0					25.0	25.0	25.0
Effective Green, g (s)		25.0			25.0					25.0	25.0	25.0
Actuated g/C Ratio		0.42			0.42					0.42	0.42	0.42
Clearance Time (s)		5.0			5.0					5.0	5.0	5.0
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1500			1500					708	750	750
v/s Ratio Prot		0.04										
v/s Ratio Perm					0.06					c0.35	0.33	0.08
v/c Ratio		0.11			0.13					0.84	0.80	0.20
Uniform Delay, d1		10.7			10.8					15.8	15.3	11.2
Progression Factor		1.00			0.92					1.00	1.00	1.00
Incremental Delay, d2		0.1			0.2					11.8	8.8	0.6
Delay (s)		10.8			10.2					27.6	24.1	11.8
Level of Service		B			B					C	C	B
Approach Delay (s)		10.8			10.2			0.0			22.6	
Approach LOS		B			B			A			C	


















Intersection Summary		
HCM 2000 Control Delay	20.2	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.49	
Actuated Cycle Length (s)	60.0	Sum of lost time (s) 10.0
Intersection Capacity Utilization	47.9%	ICU Level of Service A
Analysis Period (min)	15	

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
 1: I-215 SB Ramps & Auto Center Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	134	33	1	189	0	0	0	0	1061	66	344
Future Volume (veh/h)	0	134	33	1	189	0	0	0	0	1061	66	344
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1800	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	143	28	1	201	0				1179	0	261
Adj No. of Lanes	0	2	0	0	2	0				2	0	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1194	229	61	1397	0				1349	0	637
Arrive On Green	0.00	0.42	0.42	0.83	0.83	0.00				0.42	0.00	0.42
Sat Flow, veh/h	0	2955	549	2	3435	0				3238	0	1530
Grp Volume(v), veh/h	0	84	87	108	94	0				1179	0	261
Grp Sat Flow(s),veh/h/ln	0	1710	1703	1799	1556	0				1619	0	1530
Q Serve(g_s), s	0.0	1.8	1.9	0.0	0.7	0.0				20.0	0.0	7.2
Cycle Q Clear(g_c), s	0.0	1.8	1.9	0.7	0.7	0.0				20.0	0.0	7.2
Prop In Lane	0.00		0.32	0.01		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	713	710	810	648	0				1349	0	637
V/C Ratio(X)	0.00	0.12	0.12	0.13	0.14	0.00				0.87	0.00	0.41
Avail Cap(c_a), veh/h	0	713	710	810	648	0				1349	0	637
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	10.7	10.8	3.0	3.0	0.0				16.1	0.0	12.3
Incr Delay (d2), s/veh	0.0	0.3	0.4	0.3	0.5	0.0				8.1	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.9	0.9	0.4	0.3	0.0				10.4	0.0	3.3
LnGrp Delay(d),s/veh	0.0	11.1	11.1	3.3	3.4	0.0				24.1	0.0	14.3
LnGrp LOS		B	B	A	A					C		B
Approach Vol, veh/h		171			202						1440	
Approach Delay, s/veh		11.1			3.4						22.3	
Approach LOS		B			A						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		30.0		30.0		30.0						
Change Period (Y+Rc), s		5.0		5.0		5.0						
Max Green Setting (Gmax), s		25.0		25.0		25.0						
Max Q Clear Time (g_c+I1), s		3.9		22.0		2.7						
Green Ext Time (p_c), s		1.9		1.7		1.9						
Intersection Summary												
HCM 2010 Ctrl Delay				19.2								
HCM 2010 LOS				B								
Notes												

Timings

2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.

3/27/2017

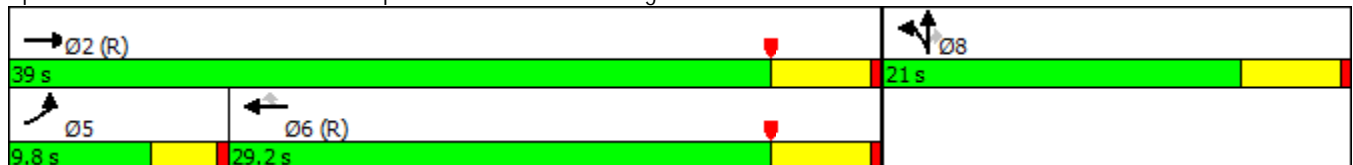


Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations	↶	↷	↷	↷	↶	↷	↷
Traffic Volume (vph)	69	1126	309	259	140	8	868
Future Volume (vph)	69	1126	309	259	140	8	868
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm
Protected Phases	5	2	6		8	8	
Permitted Phases				6			8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	8.0	8.0	8.0	5.0	5.0	5.0
Minimum Split (s)	8.5	39.0	13.0	13.0	10.0	10.0	10.0
Total Split (s)	9.8	39.0	29.2	29.2	21.0	21.0	21.0
Total Split (%)	16.3%	65.0%	48.7%	48.7%	35.0%	35.0%	35.0%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max
Act Effect Green (s)	6.0	34.0	28.1	28.1	16.0	16.0	16.0
Actuated g/C Ratio	0.10	0.57	0.47	0.47	0.27	0.27	0.27
v/c Ratio	0.45	0.61	0.20	0.29	0.18	0.17	0.92
Control Delay	27.5	8.7	12.5	8.5	18.3	18.1	35.6
Queue Delay	0.0	0.5	0.0	0.0	0.0	0.0	20.7
Total Delay	27.5	9.2	12.5	8.5	18.3	18.1	56.3
LOS	C	A	B	A	B	B	E
Approach Delay		10.3	10.7			50.7	
Approach LOS		B	B			D	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 1 (2%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 25.2
 Intersection LOS: C
 Intersection Capacity Utilization 73.2%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.
























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↖	↗↗			
Traffic Volume (vph)	69	1126	0	0	309	259	140	8	868	0	0	0
Future Volume (vph)	69	1126	0	0	309	259	140	8	868	0	0	0
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800	1700	1800	1800	1800	1800	1800
Total Lost time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	0.88			
Frbp, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.96	1.00			
Satd. Flow (prot)	1700	3600			3600	1800	1700	1800	3600			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.96	1.00			
Satd. Flow (perm)	1700	3600			3600	1800	1700	1800	3600			
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	76	1237	0	0	340	285	154	9	954	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	158	0	0	76	0	0	0
Lane Group Flow (vph)	76	1237	0	0	340	127	82	81	878	0	0	0
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	3.8	34.0			26.7	26.7	16.0	16.0	16.0			
Effective Green, g (s)	3.8	34.0			26.7	26.7	16.0	16.0	16.0			
Actuated g/C Ratio	0.06	0.57			0.44	0.44	0.27	0.27	0.27			
Clearance Time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Vehicle Extension (s)	2.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	107	2040			1602	801	453	480	960			
v/s Ratio Prot	0.04	c0.34			0.09		0.05	0.04				
v/s Ratio Perm						0.07			c0.24			
v/c Ratio	0.71	0.61			0.21	0.16	0.18	0.17	0.92			
Uniform Delay, d1	27.6	8.6			10.2	9.9	17.0	16.9	21.3			
Progression Factor	0.84	0.89			1.20	5.85	1.00	1.00	1.00			
Incremental Delay, d2	11.8	0.9			0.3	0.4	0.9	0.8	14.6			
Delay (s)	34.9	8.5			12.5	58.5	17.8	17.7	36.0			
Level of Service	C	A			B	E	B	B	D			
Approach Delay (s)		10.0			33.5			33.3			0.0	
Approach LOS		B			C			C			A	

Intersection Summary

HCM 2000 Control Delay	23.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	1126	0	0	309	259	140	8	868	0	0	0
Future Volume (veh/h)	69	1126	0	0	309	259	140	8	868	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1700	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	76	1237	0	0	340	203	160	0	795			
Adj No. of Lanes	1	2	0	0	2	1	2	0	2			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	97	1938	0	0	1534	686	863	0	816			
Arrive On Green	0.06	0.57	0.00	0.00	0.90	0.90	0.27	0.00	0.27			
Sat Flow, veh/h	1619	3510	0	0	3510	1530	3238	0	3060			
Grp Volume(v), veh/h	76	1237	0	0	340	203	160	0	795			
Grp Sat Flow(s),veh/h/ln	1619	1710	0	0	1710	1530	1619	0	1530			
Q Serve(g_s), s	2.8	14.7	0.0	0.0	0.8	1.1	2.3	0.0	15.4			
Cycle Q Clear(g_c), s	2.8	14.7	0.0	0.0	0.8	1.1	2.3	0.0	15.4			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	97	1938	0	0	1534	686	863	0	816			
V/C Ratio(X)	0.78	0.64	0.00	0.00	0.22	0.30	0.19	0.00	0.97			
Avail Cap(c_a), veh/h	170	1938	0	0	1534	686	863	0	816			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.87	0.87	1.00	0.00	1.00			
Uniform Delay (d), s/veh	27.8	8.8	0.0	0.0	1.7	1.8	17.0	0.0	21.8			
Incr Delay (d2), s/veh	5.1	1.6	0.0	0.0	0.3	1.0	0.5	0.0	25.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.4	7.3	0.0	0.0	0.4	0.5	1.1	0.0	9.4			
LnGrp Delay(d),s/veh	33.0	10.4	0.0	0.0	2.0	2.7	17.4	0.0	47.6			
LnGrp LOS	C	B			A	A	B		D			
Approach Vol, veh/h		1313			543			955				
Approach Delay, s/veh		11.8			2.3			42.6				
Approach LOS		B			A			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		39.0			7.1	31.9		21.0				
Change Period (Y+Rc), s		5.0			3.5	5.0		5.0				
Max Green Setting (Gmax), s		34.0			6.3	24.2		16.0				
Max Q Clear Time (g_c+I1), s		16.7			4.8	3.1		17.4				
Green Ext Time (p_c), s		10.5			0.0	11.9		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			20.4									
HCM 2010 LOS			C									
Notes												

Timings
3: E St. & Orange Show Rd.

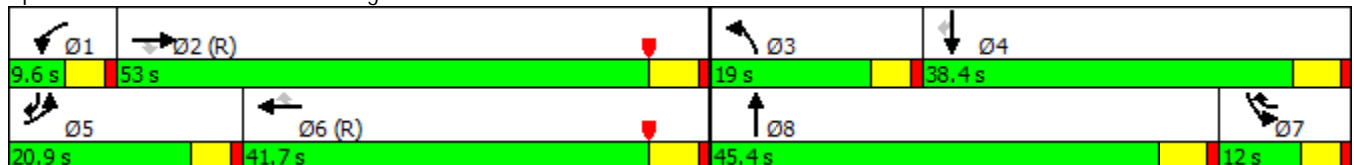


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↖↗	↑↑	↖	↖↗	↑↑	↖	↖	↑↔	↖↗	↑↑	↖
Traffic Volume (vph)	215	1260	460	60	361	62	162	168	44	126	42
Future Volume (vph)	215	1260	460	60	361	62	162	168	44	126	42
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8	7	4	5
Permitted Phases			2			6					4
Detector Phase	5	2	2	1	6	7	3	8	7	4	5
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0
Minimum Split (s)	9.6	39.4	39.4	9.6	39.4	9.6	9.6	38.4	9.6	38.4	9.6
Total Split (s)	20.9	53.0	53.0	9.6	41.7	12.0	19.0	45.4	12.0	38.4	20.9
Total Split (%)	17.4%	44.2%	44.2%	8.0%	34.8%	10.0%	15.8%	37.8%	10.0%	32.0%	17.4%
Yellow Time (s)	3.6	4.4	4.4	3.6	4.4	3.6	3.6	4.4	3.6	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4	4.6	5.4	4.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	Max	None	Max	None
Act Effct Green (s)	13.2	49.5	49.5	5.0	39.4	47.1	14.2	42.4	6.9	33.2	51.9
Actuated g/C Ratio	0.11	0.41	0.41	0.04	0.33	0.39	0.12	0.35	0.06	0.28	0.43
v/c Ratio	0.69	0.96	0.54	0.51	0.35	0.09	0.92	0.24	0.27	0.14	0.06
Control Delay	55.4	47.8	11.0	74.8	34.9	4.7	97.8	17.1	57.7	33.3	2.9
Queue Delay	0.0	26.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.4	73.8	11.4	74.8	34.9	4.7	97.8	17.1	57.7	33.3	2.9
LOS	E	E	B	E	C	A	F	B	E	C	A
Approach Delay		56.9			36.0			46.5		32.3	
Approach LOS		E			D			D		C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 92 (77%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 50.4
 Intersection LOS: D
 Intersection Capacity Utilization 89.3%
 ICU Level of Service E
 Analysis Period (min) 15

























Splits and Phases: 3: E St. & Orange Show Rd.


























HCM Signalized Intersection Capacity Analysis
3: E St. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	215	1260	460	60	361	62	162	168	114	44	126	42	
Future Volume (vph)	215	1260	460	60	361	62	162	168	114	44	126	42	
Ideal Flow (vphp)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800	
Total Lost time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95		0.97	0.95	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99		1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	3200	3600	1800	3200	3600	1800	1700	3600		3200	3600	1800	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	3200	3600	1800	3200	3600	1800	1700	3600		3200	3600	1800	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	
Adj. Flow (vph)	244	1432	523	68	410	70	184	191	130	50	143	48	
RTOR Reduction (vph)	0	0	228	0	0	44	0	84	0	0	0	29	
Lane Group Flow (vph)	244	1432	295	68	410	26	184	237	0	50	143	19	
Confl. Peds. (#/hr)									2				
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov	
Protected Phases	5	2		1	6	7	3	8		7	4	5	
Permitted Phases			2			6						4	
Actuated Green, G (s)	13.2	47.7	47.7	4.0	38.5	44.4	14.2	42.4		5.9	34.1	47.3	
Effective Green, g (s)	13.2	47.7	47.7	4.0	38.5	44.4	14.2	42.4		5.9	34.1	47.3	
Actuated g/C Ratio	0.11	0.40	0.40	0.03	0.32	0.37	0.12	0.35		0.05	0.28	0.39	
Clearance Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6	
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	2.0	2.0	3.0		2.0	3.0	2.0	
Lane Grp Cap (vph)	352	1431	715	106	1155	666	201	1272		157	1023	709	
v/s Ratio Prot	c0.08	c0.40		0.02	0.11	0.00	c0.11	c0.07		c0.02	0.04	0.00	
v/s Ratio Perm			0.16			0.01						0.01	
v/c Ratio	0.69	1.00	0.41	0.64	0.35	0.04	0.92	0.19		0.32	0.14	0.03	
Uniform Delay, d1	51.4	36.1	26.0	57.3	31.2	24.2	52.3	26.9		55.1	32.0	22.3	
Progression Factor	0.94	1.02	1.31	1.10	1.09	1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2	3.1	19.4	1.1	9.0	0.8	0.0	39.7	0.3		0.4	0.3	0.0	
Delay (s)	51.6	56.1	35.2	71.8	34.8	24.2	92.0	27.2		55.5	32.3	22.3	
Level of Service	D	E	D	E	C	C	F	C		E	C	C	
Approach Delay (s)		50.6			38.1			50.8			35.1		
Approach LOS		D			D			D			D		
Intersection Summary													
HCM 2000 Control Delay			47.6									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.72										
Actuated Cycle Length (s)			120.0									Sum of lost time (s)	20.0
Intersection Capacity Utilization			89.3%									ICU Level of Service	E
Analysis Period (min)			15										
c Critical Lane Group													

HCM 2010 Signalized Intersection Summary
3: E St. & Orange Show Rd.

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	215	1260	460	60	361	62	162	168	114	44	126	42
Future Volume (veh/h)	215	1260	460	60	361	62	162	168	114	44	126	42
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	244	1432	272	68	410	39	184	191	98	50	143	26
Adj No. of Lanes	2	2	1	2	2	1	1	2	0	2	2	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	289	1371	614	110	1165	605	183	741	364	163	940	570
Arrive On Green	0.20	0.80	0.80	0.07	0.68	0.68	0.12	0.33	0.33	0.05	0.28	0.28
Sat Flow, veh/h	2956	3420	1530	2956	3420	1530	1524	2222	1093	2956	3420	1530
Grp Volume(v), veh/h	244	1432	272	68	410	39	184	145	144	50	143	26
Grp Sat Flow(s),veh/h/ln	1478	1710	1530	1478	1710	1530	1524	1710	1605	1478	1710	1530
Q Serve(g_s), s	9.5	48.1	6.6	2.7	6.0	0.2	14.4	7.4	7.9	2.0	3.8	1.3
Cycle Q Clear(g_c), s	9.5	48.1	6.6	2.7	6.0	0.2	14.4	7.4	7.9	2.0	3.8	1.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.68	1.00		1.00
Lane Grp Cap(c), veh/h	289	1371	614	110	1165	605	183	570	535	163	941	570
V/C Ratio(X)	0.84	1.04	0.44	0.62	0.35	0.06	1.01	0.25	0.27	0.31	0.15	0.05
Avail Cap(c_a), veh/h	402	1371	614	123	1165	605	183	570	535	182	941	570
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.59	0.59	0.59	0.93	0.93	0.93	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.4	11.9	7.8	54.7	13.6	4.8	52.8	29.1	29.3	54.5	32.9	24.0
Incr Delay (d2), s/veh	5.1	31.4	1.4	4.2	0.8	0.2	68.2	1.1	1.2	0.4	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	26.9	2.9	1.2	2.9	0.3	9.5	3.7	3.7	0.8	1.8	0.6
LnGrp Delay(d),s/veh	52.5	43.3	9.1	58.9	14.4	4.9	121.0	30.2	30.5	54.9	33.3	24.2
LnGrp LOS	D	F	A	E	B	A	F	C	C	D	C	C
Approach Vol, veh/h		1948			517			473			219	
Approach Delay, s/veh		39.7			19.5			65.6			37.1	
Approach LOS		D			B			E			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.1	53.5	19.0	38.4	16.3	46.3	12.0	45.4				
Change Period (Y+Rc), s	4.6	5.4	4.6	5.4	4.6	5.4	5.4	* 5.4				
Max Green Setting (Gmax), s	5.0	47.6	14.4	33.0	16.3	36.3	7.4	* 40				
Max Q Clear Time (g_c+I1), s	4.7	50.1	16.4	5.8	11.5	8.0	4.0	9.9				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.9	0.2	21.9	0.3	1.6				
Intersection Summary												
HCM 2010 Ctrl Delay			40.1									
HCM 2010 LOS			D									
Notes												

Timings
4: Arrowhead Av. & Orange Show Rd.

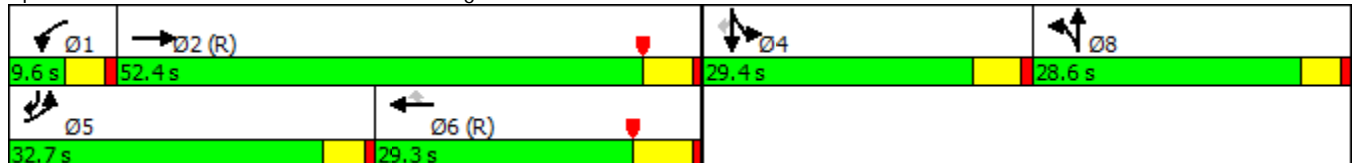


Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	286	1041	7	315	85	3	87	11	192
Future Volume (vph)	286	1041	7	315	85	3	87	11	192
Turn Type	Prot	NA	Prot	NA	Perm	NA	Split	NA	pm+ov
Protected Phases	5	2	1	6		8	4	4	5
Permitted Phases					6				4
Detector Phase	5	2	1	6	6	8	4	4	5
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	28.4	9.6	29.2	29.2	28.6	29.4	29.4	9.6
Total Split (s)	32.7	52.4	9.6	29.3	29.3	28.6	29.4	29.4	32.7
Total Split (%)	27.3%	43.7%	8.0%	24.4%	24.4%	23.8%	24.5%	24.5%	27.3%
Yellow Time (s)	3.6	4.4	3.6	5.2	5.2	3.6	4.4	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	6.2	6.2	4.6	5.4	5.4	4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag				Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				Yes
Recall Mode	None	C-Max	None	C-Max	C-Max	Max	Max	Max	None
Act Effct Green (s)	25.6	54.7	5.0	25.6	25.6	24.0	24.0	24.0	50.4
Actuated g/C Ratio	0.21	0.46	0.04	0.21	0.21	0.20	0.20	0.20	0.42
v/c Ratio	0.90	0.73	0.11	0.47	0.19	0.02	0.16	0.16	0.25
Control Delay	81.7	34.9	59.0	44.3	2.4	26.6	41.2	41.1	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.7	34.9	59.0	44.3	2.4	26.6	41.2	41.1	2.0
LOS	F	C	E	D	A	C	D	D	A
Approach Delay		44.9		35.8		26.6		15.3	
Approach LOS		D		D		C		B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 86 (72%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.90
 Intersection Signal Delay: 38.8
 Intersection LOS: D
 Intersection Capacity Utilization 67.9%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 4: Arrowhead Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
4: Arrowhead Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)























3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↖	↖	↗		↖	↗	↖
Traffic Volume (vph)	286	1041	17	7	315	85	0	3	5	87	11	192
Future Volume (vph)	286	1041	17	7	315	85	0	3	5	87	11	192
Ideal Flow (vphp)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	6.2	6.2		4.6		5.4	5.4	4.6
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00		0.99		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00		0.95	0.96	1.00
Satd. Flow (prot)	1700	3600		1700	3600	1800		1800		1700	1800	1800
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00		0.95	0.96	1.00
Satd. Flow (perm)	1700	3600		1700	3600	1800		1800		1700	1800	1800
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	325	1183	19	8	358	97	0	3	6	99	12	218
RTOR Reduction (vph)	0	1	0	0	0	76	0	5	0	0	0	128
Lane Group Flow (vph)	325	1201	0	8	358	21	0	4	0	55	57	90
Confl. Peds. (#/hr)									6			7
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		8	8		4	4	5
Permitted Phases						6						4
Actuated Green, G (s)	25.6	51.0		1.0	25.6	25.6		24.0		24.0	24.0	49.6
Effective Green, g (s)	25.6	51.0		1.0	25.6	25.6		24.0		24.0	24.0	49.6
Actuated g/C Ratio	0.21	0.42		0.01	0.21	0.21		0.20		0.20	0.20	0.41
Clearance Time (s)	4.6	5.4		4.6	6.2	6.2		4.6		5.4	5.4	4.6
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0		3.0		3.0	3.0	2.0
Lane Grp Cap (vph)	362	1530		14	768	384		360		340	360	744
v/s Ratio Prot	c0.19	c0.33		0.00	0.10			c0.00		c0.03	0.03	0.03
v/s Ratio Perm						0.01						0.02
v/c Ratio	0.90	0.78		0.57	0.47	0.05		0.01		0.16	0.16	0.12
Uniform Delay, d1	45.9	29.8		59.3	41.2	37.6		38.5		39.7	39.7	21.7
Progression Factor	1.49	1.22		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	12.3	1.9		30.5	2.0	0.3		0.1		1.0	0.9	0.0
Delay (s)	80.5	38.2		89.8	43.3	37.8		38.5		40.7	40.6	21.8
Level of Service	F	D		F	D	D		D		D	D	C
Approach Delay (s)		47.2			42.9			38.5			28.2	
Approach LOS		D			D			D			C	

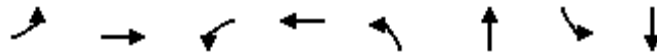
Intersection Summary

HCM 2000 Control Delay	43.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.8
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	286	1041	17	7	315	85	0	3	5	87	11	192
Future Volume (veh/h)	286	1041	17	7	315	85	0	3	5	87	11	192
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	325	1183	18	8	358	77	0	3	6	108	0	124
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	346	1438	22	16	728	326	324	107	213	648	0	630
Arrive On Green	0.28	0.55	0.55	0.01	0.21	0.21	0.00	0.20	0.20	0.20	0.00	0.20
Sat Flow, veh/h	1619	3448	52	1619	3420	1530	1619	533	1067	3238	0	1514
Grp Volume(v), veh/h	325	587	614	8	358	77	0	0	9	108	0	124
Grp Sat Flow(s),veh/h/ln	1619	1710	1791	1619	1710	1530	1619	0	1600	1619	0	1514
Q Serve(g_s), s	23.5	33.7	33.7	0.6	11.0	5.0	0.0	0.0	0.5	3.3	0.0	6.3
Cycle Q Clear(g_c), s	23.5	33.7	33.7	0.6	11.0	5.0	0.0	0.0	0.5	3.3	0.0	6.3
Prop In Lane	1.00		0.03	1.00		1.00	1.00		0.67	1.00		1.00
Lane Grp Cap(c), veh/h	346	713	747	16	728	326	324	0	320	648	0	630
V/C Ratio(X)	0.94	0.82	0.82	0.51	0.49	0.24	0.00	0.00	0.03	0.17	0.00	0.20
Avail Cap(c_a), veh/h	379	713	747	67	728	326	324	0	320	648	0	630
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.23	0.23	0.23	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.2	23.1	23.1	59.1	41.5	39.1	0.0	0.0	38.6	39.7	0.0	22.5
Incr Delay (d2), s/veh	9.9	2.6	2.5	9.0	2.4	1.7	0.0	0.0	0.2	0.6	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.4	16.2	16.9	0.3	5.5	2.3	0.0	0.0	0.3	1.5	0.0	2.8
LnGrp Delay(d),s/veh	52.0	25.7	25.6	68.2	43.9	40.9	0.0	0.0	38.8	40.3	0.0	23.2
LnGrp LOS	D	C	C	E	D	D			D	D		C
Approach Vol, veh/h		1526			443			9			232	
Approach Delay, s/veh		31.3			43.8			38.8			31.1	
Approach LOS		C			D			D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.8	56.2		29.4	30.3	31.7		28.6				
Change Period (Y+Rc), s	4.6	* 6.2		5.4	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.0	* 47		24.0	28.1	23.1		24.0				
Max Q Clear Time (g_c+I1), s	2.6	35.7		8.3	25.5	13.0		2.5				
Green Ext Time (p_c), s	0.0	8.5		0.6	0.1	7.7		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				33.8								
HCM 2010 LOS				C								
Notes												

Timings

5: Washington Av./Washington Av. & Orange Show Rd.

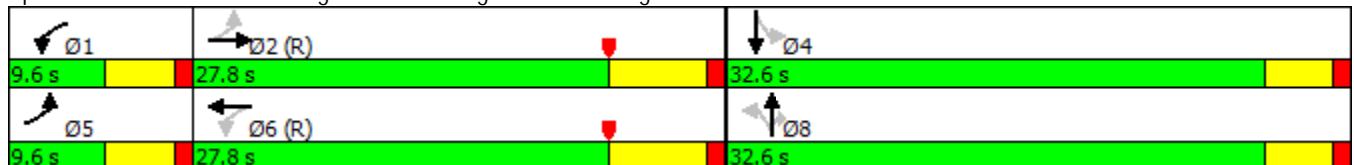


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↗		↖		↗
Traffic Volume (vph)	49	1056	2	386	16	3	3	1
Future Volume (vph)	49	1056	2	386	16	3	3	1
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	9.6	23.2	32.6	32.6	32.6	32.6
Total Split (s)	9.6	27.8	9.6	27.8	32.6	32.6	32.6	32.6
Total Split (%)	13.7%	39.7%	13.7%	39.7%	46.6%	46.6%	46.6%	46.6%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effect Green (s)	58.7	56.2	57.7	51.0		13.6		13.6
Actuated g/C Ratio	0.84	0.80	0.82	0.73		0.19		0.19
v/c Ratio	0.04	0.40	0.00	0.16		0.06		0.03
Control Delay	5.4	9.9	7.0	8.1		19.8		12.6
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	5.4	9.9	7.0	8.1		19.8		12.6
LOS	A	A	A	A		B		B
Approach Delay		9.7		8.1		19.8		12.6
Approach LOS		A		A		B		B

Intersection Summary

Cycle Length: 70
 Actuated Cycle Length: 70
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.40
 Intersection Signal Delay: 9.4
 Intersection LOS: A
 Intersection Capacity Utilization 57.2%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 5: Washington Av./Washington Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 5: Washington Av./Washington Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↗		↖	↑↗			↖	↗		↕	
Traffic Volume (vph)	49	1056	32	2	386	12	16	3	0	3	1	7
Future Volume (vph)	49	1056	32	2	386	12	16	3	0	3	1	7
Ideal Flow (vphp)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2		4.6	6.2			4.6			4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			1.00			0.91	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1700	3600		1700	3600			1800			1800	
Flt Permitted	0.48	1.00		0.22	1.00			0.76			0.93	
Satd. Flow (perm)	1700	3600		1700	3600			1800			1800	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	53	1135	34	2	415	13	17	3	0	3	1	8
RTOR Reduction (vph)	0	1	0	0	2	0	0	0	0	0	7	0
Lane Group Flow (vph)	53	1168	0	2	426	0	0	20	0	0	5	0
Confl. Peds. (#/hr)			1									
Confl. Bikes (#/hr)			1			1						
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)	49.1	46.0		44.9	43.9			7.6			7.6	
Effective Green, g (s)	49.1	46.0		44.9	43.9			7.6			7.6	
Actuated g/C Ratio	0.70	0.66		0.64	0.63			0.11			0.11	
Clearance Time (s)	4.6	6.2		4.6	6.2			4.6			4.6	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	1192	2365		1090	2257			195			195	
v/s Ratio Prot	c0.00	c0.32		0.00	0.12							
v/s Ratio Perm	0.03			0.00				0.01			0.00	
v/c Ratio	0.04	0.49		0.00	0.19			0.10			0.02	
Uniform Delay, d1	3.3	6.1		4.6	5.5			28.1			27.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	0.7		0.0	0.2			0.2			0.1	
Delay (s)	3.3	6.8		4.6	5.7			28.4			27.9	
Level of Service	A	A		A	A			C			C	
Approach Delay (s)		6.7			5.7			28.4			27.9	
Approach LOS		A			A			C			C	

Intersection Summary




















HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	15.4
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
 5: Washington Av./Washington Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	1056	32	2	386	12	16	3	0	3	1	7
Future Volume (veh/h)	49	1056	32	2	386	12	16	3	0	3	1	7
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	53	1135	34	2	415	13	17	3	0	3	1	0
Adj No. of Lanes	1	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	763	2453	73	377	2303	72	156	20	82	141	33	0
Arrive On Green	0.05	0.72	0.72	0.00	0.68	0.68	0.05	0.05	0.00	0.05	0.05	0.00
Sat Flow, veh/h	1619	3388	101	1619	3383	106	1145	367	1530	956	616	0
Grp Volume(v), veh/h	53	573	596	2	209	219	20	0	0	4	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1780	1619	1710	1779	1512	0	1530	1573	0	0
Q Serve(g_s), s	0.6	9.7	9.7	0.0	3.1	3.1	0.5	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.6	9.7	9.7	0.0	3.1	3.1	0.8	0.0	0.0	0.1	0.0	0.0
Prop In Lane	1.00		0.06	1.00		0.06	0.85		1.00	0.75		0.00
Lane Grp Cap(c), veh/h	763	1238	1288	377	1164	1211	176	0	82	174	0	0
V/C Ratio(X)	0.07	0.46	0.46	0.01	0.18	0.18	0.11	0.00	0.00	0.02	0.00	0.00
Avail Cap(c_a), veh/h	804	1238	1288	488	1164	1211	690	0	612	698	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.86	0.86	0.86	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	2.7	4.0	4.0	3.8	4.1	4.1	31.7	0.0	0.0	31.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.2	1.2	0.0	0.3	0.3	0.3	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	4.9	5.1	0.0	1.5	1.6	0.4	0.0	0.0	0.1	0.0	0.0
LnGrp Delay(d),s/veh	2.7	5.3	5.2	3.8	4.4	4.3	32.0	0.0	0.0	31.5	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C			C		
Approach Vol, veh/h		1222			430			20				4
Approach Delay, s/veh		5.1			4.3			32.0				31.5
Approach LOS		A			A			C				C
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.8	56.9		8.3	7.8	53.9		8.3				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.0	21.6		28.0	5.0	21.6		28.0				
Max Q Clear Time (g_c+I1), s	2.0	11.7		2.1	2.6	5.1		2.8				
Green Ext Time (p_c), s	0.0	7.3		0.1	0.0	10.9		0.1				
Intersection Summary												
HCM 2010 Ctrl Delay			5.3									
HCM 2010 LOS			A									

Intersection

Int Delay, s/veh 1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			4	4	
Traffic Vol, veh/h	10	0	0	6	12	24
Future Vol, veh/h	10	0	0	6	12	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	11	0	0	7	13	26

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	33	26	39	0	-	0
Stage 1	26	-	-	-	-	-
Stage 2	7	-	-	-	-	-
Critical Hdwy	7.1	6.2	4.1	-	-	-
Critical Hdwy Stg 1	6.1	-	-	-	-	-
Critical Hdwy Stg 2	6.1	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	979	1056	1584	-	-	-
Stage 1	997	-	-	-	-	-
Stage 2	1020	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	979	1056	1584	-	-	-
Mov Cap-2 Maneuver	979	-	-	-	-	-
Stage 1	997	-	-	-	-	-
Stage 2	1020	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1584	-	979	-	-
HCM Lane V/C Ratio	-	-	0.011	-	-
HCM Control Delay (s)	0	-	8.7	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection												
Int Delay, s/veh	5.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↔	
Traffic Vol, veh/h	0	0	0	0	0	8	0	0	0	12	0	0
Future Vol, veh/h	0	0	0	0	0	8	0	0	0	12	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	70	70	70	70	70	70	70	70	70	70	70
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	11	0	0	0	17	0	0

Major/Minor	Major1			Major2			Minor2				
Conflicting Flow All	11	0	-	-	-	0	-	-	6	6	6
Stage 1	-	-	-	-	-	-	-	-	6	6	-
Stage 2	-	-	-	-	-	-	-	-	0	0	-
Critical Hdwy	4.1	-	-	-	-	-	-	-	6.4	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	5.4	5.5	-
Follow-up Hdwy	2.2	-	-	-	-	-	-	-	3.5	4	3.3
Pot Cap-1 Maneuver	1621	-	0	0	-	-	-	-	1021	893	1083
Stage 1	-	-	0	0	-	-	-	-	1022	895	-
Stage 2	-	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1621	-	-	-	-	-	-	-	1021	0	1083
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	1021	0	-
Stage 1	-	-	-	-	-	-	-	-	1022	0	-
Stage 2	-	-	-	-	-	-	-	-	-	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1621	-	-	-	1021
HCM Lane V/C Ratio	-	-	-	-	0.017
HCM Control Delay (s)	0	-	-	-	8.6
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection

Int Delay, s/veh 7.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	0	0	8	0	10	0	12	24	0
Future Vol, veh/h	0	0	0	0	0	8	0	10	0	12	24	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	70	70	70	70	70	70	70	70	70	70	70
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	11	0	14	0	17	34	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	11	0	0	1	0	0	24	12	1	15	7	6
Stage 1	-	-	-	-	-	-	1	1	-	6	6	-
Stage 2	-	-	-	-	-	-	23	11	-	9	1	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1621	-	-	1635	-	-	993	887	1090	1006	892	1083
Stage 1	-	-	-	-	-	-	1027	899	-	1021	895	-
Stage 2	-	-	-	-	-	-	1000	890	-	1017	899	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1621	-	-	1635	-	-	964	887	1090	994	892	1083
Mov Cap-2 Maneuver	-	-	-	-	-	-	964	887	-	994	892	-
Stage 1	-	-	-	-	-	-	1027	899	-	1021	895	-
Stage 2	-	-	-	-	-	-	962	890	-	1001	899	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	9.1	9.1
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	887	1621	-	-	1635	-	-	924
HCM Lane V/C Ratio	0.016	-	-	-	-	-	-	0.056
HCM Control Delay (s)	9.1	0	-	-	0	-	-	9.1
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.2

Timings

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.

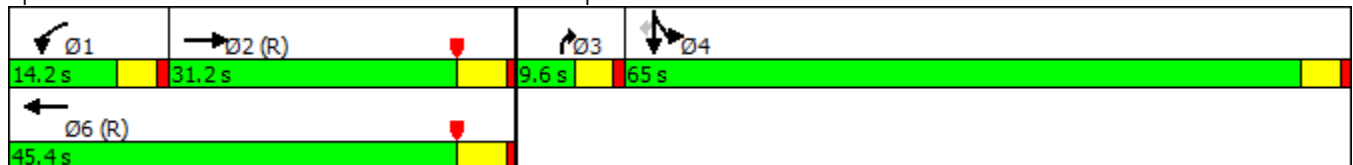


Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↑	↑↑	↑	↑	↑	↑
Traffic Volume (vph)	450	35	411	23	580	304	615
Future Volume (vph)	450	35	411	23	580	304	615
Turn Type	NA	Prot	NA	Prot	Split	NA	Perm
Protected Phases	2	1	6	3	4	4	
Permitted Phases							4
Detector Phase	2	1	6	3	4	4	4
Switch Phase							
Minimum Initial (s)	10.0	5.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	22.4	9.6	15.4	9.5	14.6	14.6	14.6
Total Split (s)	31.2	14.2	45.4	9.6	65.0	65.0	65.0
Total Split (%)	26.0%	11.8%	37.8%	8.0%	54.2%	54.2%	54.2%
Yellow Time (s)	4.4	3.6	4.4	3.5	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	4.6	5.4	4.5	4.6	4.6	4.6
Lead/Lag	Lag	Lead		Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes
Recall Mode	C-Max	None	C-Max	None	Max	Max	Max
Act Effect Green (s)	32.2	7.2	40.0	5.1	64.2	64.2	64.2
Actuated g/C Ratio	0.27	0.06	0.33	0.04	0.54	0.54	0.54
v/c Ratio	0.54	0.38	0.37	0.08	0.52	0.51	0.61
Control Delay	41.0	64.2	31.6	0.5	21.4	21.0	13.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.0	64.2	31.6	0.5	21.4	21.0	13.0
LOS	D	E	C	A	C	C	B
Approach Delay	41.0		34.1			17.8	
Approach LOS	D		C			B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.61
 Intersection Signal Delay: 25.2
 Intersection LOS: C
 Intersection Capacity Utilization 60.5%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.



HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑↑				↑	↑	↑	↑
Traffic Volume (vph)	0	450	31	35	411	0	0	0	23	580	304	615
Future Volume (vph)	0	450	31	35	411	0	0	0	23	580	304	615
Ideal Flow (vphpl)	1800	1800	1800	1700	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Lane Util. Factor		0.95		1.00	0.95				1.00	0.95	0.95	1.00
Frbp, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Frt		0.99		1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00				1.00	0.95	0.98	1.00
Satd. Flow (prot)		3600		1700	3600				1800	1700	1800	1800
Flt Permitted		1.00		0.95	1.00				1.00	0.95	0.98	1.00
Satd. Flow (perm)		3600		1700	3600				1800	1700	1800	1800
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	489	34	38	447	0	0	0	25	630	330	668
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	24	0	0	140
Lane Group Flow (vph)	0	519	0	38	447	0	0	0	1	472	488	528
Confl. Peds. (#/hr)			6			1						
Confl. Bikes (#/hr)						2						
Turn Type		NA		Prot	NA				Prot	Split	NA	Perm
Protected Phases		2		1	6				3	4	4	
Permitted Phases												4
Actuated Green, G (s)		28.6		5.0	38.2				3.1	64.2	64.2	64.2
Effective Green, g (s)		28.6		5.0	38.2				3.1	64.2	64.2	64.2
Actuated g/C Ratio		0.24		0.04	0.32				0.03	0.54	0.54	0.54
Clearance Time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Vehicle Extension (s)		3.0		2.0	3.0				3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		858		70	1146				46	909	963	963
v/s Ratio Prot		c0.14		0.02	c0.12				c0.00	0.28	0.27	
v/s Ratio Perm												c0.29
v/c Ratio		0.61		0.54	0.39				0.01	0.52	0.51	0.55
Uniform Delay, d1		40.7		56.4	31.8				57.0	18.0	17.8	18.4
Progression Factor		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		3.2		4.5	1.0				0.1	2.1	1.9	2.2
Delay (s)		43.8		60.9	32.8				57.1	20.1	19.7	20.6
Level of Service		D		E	C				E	C	B	C
Approach Delay (s)		43.8			35.0			57.1			20.2	
Approach LOS		D			D			E			C	

Intersection Summary			
HCM 2000 Control Delay	27.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.1
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	450	31	35	411	0	0	0	23	580	304	615
Future Volume (veh/h)	0	450	31	35	411	0	0	0	23	580	304	615
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	0	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	489	23	38	447	0	0	0	12	480	540	666
Adj No. of Lanes	0	2	0	1	2	0	0	0	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1147	54	48	1414	0	0	0	0	815	906	770
Arrive On Green	0.00	0.35	0.35	0.03	0.41	0.00	0.00	0.00	0.00	0.50	0.50	0.50
Sat Flow, veh/h	0	3415	156	1619	3510	0		0		1619	1800	1530
Grp Volume(v), veh/h	0	251	261	38	447	0		0.0		480	540	666
Grp Sat Flow(s),veh/h/ln	0	1710	1771	1619	1710	0				1619	1800	1530
Q Serve(g_s), s	0.0	13.5	13.6	2.8	10.6	0.0				25.1	25.5	45.9
Cycle Q Clear(g_c), s	0.0	13.5	13.6	2.8	10.6	0.0				25.1	25.5	45.9
Prop In Lane	0.00		0.09	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	590	611	48	1414	0				815	906	770
V/C Ratio(X)	0.00	0.43	0.43	0.78	0.32	0.00				0.59	0.60	0.86
Avail Cap(c_a), veh/h	0	590	611	130	1414	0				815	906	770
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.78	0.78	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	30.2	30.2	57.8	23.8	0.0				21.0	21.1	26.2
Incr Delay (d2), s/veh	0.0	2.2	2.2	7.8	0.5	0.0				3.1	2.9	12.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	6.7	7.0	1.4	5.1	0.0				11.9	13.3	21.9
LnGrp Delay(d),s/veh	0.0	32.4	32.4	65.6	24.2	0.0				24.2	24.0	38.6
LnGrp LOS		C	C	E	C					C	C	D
Approach Vol, veh/h		512			485						1686	
Approach Delay, s/veh		32.4			27.5						29.8	
Approach LOS		C			C						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	8.2	46.8		65.0		55.0						
Change Period (Y+Rc), s	4.6	5.4		4.6		5.4						
Max Green Setting (Gmax), s	9.6	25.8		60.4		40.0						
Max Q Clear Time (g_c+I1), s	4.8	15.6		47.9		12.6						
Green Ext Time (p_c), s	0.0	4.1		6.1		6.2						
Intersection Summary												
HCM 2010 Ctrl Delay				29.9								
HCM 2010 LOS				C								
Notes												

Timings

9: Waterman Av. & Orange Show Rd./Orange Show Rd.

3/27/2017

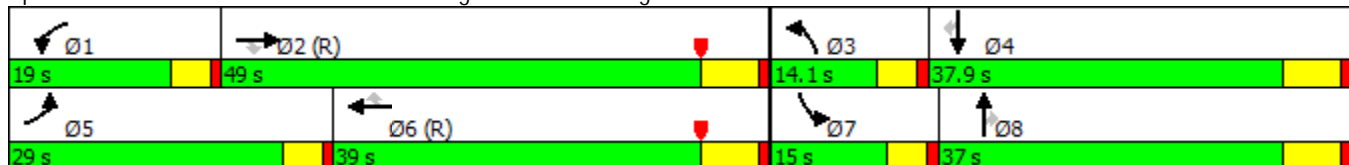


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	169	518	359	104	274	84	70	470	66	72	567	64
Future Volume (vph)	169	518	359	104	274	84	70	470	66	72	567	64
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.2	35.2	9.6	35.2	35.2	9.6	33.2	33.2	9.6	33.2	33.2
Total Split (s)	29.0	49.0	49.0	19.0	39.0	39.0	14.1	37.0	37.0	15.0	37.9	37.9
Total Split (%)	24.2%	40.8%	40.8%	15.8%	32.5%	32.5%	11.8%	30.8%	30.8%	12.5%	31.6%	31.6%
Yellow Time (s)	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Act Effect Green (s)	18.1	45.2	45.2	12.0	39.1	39.1	8.6	34.2	34.2	9.1	34.7	34.7
Actuated g/C Ratio	0.15	0.38	0.38	0.10	0.33	0.33	0.07	0.28	0.28	0.08	0.29	0.29
v/c Ratio	0.77	0.44	0.49	0.72	0.54	0.14	0.67	0.53	0.12	0.66	0.63	0.12
Control Delay	68.1	29.7	10.9	74.8	38.6	1.3	80.3	39.5	0.4	77.0	41.3	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.1	29.7	10.9	74.8	38.6	1.3	80.3	39.5	0.4	77.0	41.3	0.4
LOS	E	C	B	E	D	A	F	D	A	E	D	A
Approach Delay		29.5			39.9			39.9			41.2	
Approach LOS		C			D			D			D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 36.4
 Intersection LOS: D
 Intersection Capacity Utilization 64.6%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗↗	↘	↘	↗	↘	↘	↗↗	↘	↘	↗↗	↘
Traffic Volume (vph)	169	518	359	104	274	84	70	470	66	72	567	64
Future Volume (vph)	169	518	359	104	274	84	70	470	66	72	567	64
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	197	602	417	121	319	98	81	547	77	84	659	74
RTOR Reduction (vph)	0	0	182	0	0	67	0	0	55	0	0	53
Lane Group Flow (vph)	197	602	235	121	319	31	81	547	22	84	659	21
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	NA	4
Permitted Phases			2			6			8			4
Actuated Green, G (s)	18.1	44.3	44.3	12.0	38.2	38.2	7.4	34.2	34.2	7.9	34.7	34.7
Effective Green, g (s)	18.1	44.3	44.3	12.0	38.2	38.2	7.4	34.2	34.2	7.9	34.7	34.7
Actuated g/C Ratio	0.15	0.37	0.37	0.10	0.32	0.32	0.06	0.29	0.29	0.07	0.29	0.29
Clearance Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	256	1329	664	170	573	573	104	1026	513	111	1041	520
v/s Ratio Prot	c0.12	0.17		0.07	c0.18		0.05	0.15		c0.05	c0.18	
v/s Ratio Perm			0.13			0.02			0.01			0.01
v/c Ratio	0.77	0.45	0.35	0.71	0.56	0.05	0.78	0.53	0.04	0.76	0.63	0.04
Uniform Delay, d1	48.9	28.7	27.5	52.3	33.9	28.4	55.5	36.2	31.1	55.1	37.1	30.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.8	1.1	1.5	11.1	3.9	0.2	27.7	2.0	0.2	22.6	2.9	0.1
Delay (s)	60.8	29.8	29.0	63.4	37.8	28.6	83.2	38.2	31.2	77.7	40.0	30.8
Level of Service	E	C	C	E	D	C	F	D	C	E	D	C
Approach Delay (s)		34.5			41.8			42.6			43.1	
Approach LOS		C			D			D			D	

Intersection Summary

























HCM 2000 Control Delay	39.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	64.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	169	518	359	104	274	84	70	470	66	72	567	64
Future Volume (veh/h)	169	518	359	104	274	84	70	470	66	72	567	64
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	197	602	318	121	319	57	81	547	41	84	659	51
Adj No. of Lanes	1	2	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	222	1386	620	144	642	546	100	896	401	103	903	404
Arrive On Green	0.14	0.41	0.41	0.09	0.36	0.36	0.06	0.26	0.26	0.06	0.26	0.26
Sat Flow, veh/h	1619	3420	1530	1619	1800	1530	1619	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	197	602	318	121	319	57	81	547	41	84	659	51
Grp Sat Flow(s),veh/h/ln	1619	1710	1530	1619	1800	1530	1619	1710	1530	1619	1710	1530
Q Serve(g_s), s	14.3	15.2	18.7	8.8	16.6	3.0	5.9	16.9	2.4	6.1	21.1	3.0
Cycle Q Clear(g_c), s	14.3	15.2	18.7	8.8	16.6	3.0	5.9	16.9	2.4	6.1	21.1	3.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	222	1386	620	144	642	546	100	896	401	103	903	404
V/C Ratio(X)	0.89	0.43	0.51	0.84	0.50	0.10	0.81	0.61	0.10	0.81	0.73	0.13
Avail Cap(c_a), veh/h	329	1386	620	194	642	546	128	896	401	140	903	404
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.8	25.8	26.8	53.8	30.2	25.8	55.6	38.9	33.6	55.5	40.2	33.6
Incr Delay (d2), s/veh	12.3	0.9	2.8	16.3	2.7	0.4	20.1	3.1	0.5	16.5	5.2	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.2	7.4	8.4	4.6	8.7	1.3	3.2	8.4	1.1	3.2	10.6	1.4
LnGrp Delay(d),s/veh	63.1	26.7	29.6	70.2	32.9	26.2	75.7	42.0	34.1	71.9	45.4	34.2
LnGrp LOS	E	C	C	E	C	C	E	D	C	E	D	C
Approach Vol, veh/h		1117			497			669			794	
Approach Delay, s/veh		33.9			41.2			45.6			47.5	
Approach LOS		C			D			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.3	54.8	12.0	37.9	21.1	49.0	12.3	37.6				
Change Period (Y+Rc), s	4.6	6.2	4.6	6.2	4.6	6.2	4.6	6.2				
Max Green Setting (Gmax), s	14.4	42.8	9.5	31.7	24.4	32.8	10.4	30.8				
Max Q Clear Time (g_c+I1), s	10.8	20.7	7.9	23.1	16.3	18.6	8.1	18.9				
Green Ext Time (p_c), s	0.0	9.9	0.0	4.7	0.2	7.7	0.0	5.8				
Intersection Summary												
HCM 2010 Ctrl Delay			41.1									
HCM 2010 LOS			D									

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↕	↕
Traffic Vol, veh/h	3	10	1	602	1066	8
Future Vol, veh/h	3	10	1	602	1066	8
Conflicting Peds, #/hr	0	0	0	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	75	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	4	13	1	753	1333	10

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1719	673	1345 0
Stage 1	1340	-	- -
Stage 2	379	-	- -
Critical Hdwy	6.8	6.9	4.1 -
Critical Hdwy Stg 1	5.8	-	- -
Critical Hdwy Stg 2	5.8	-	- -
Follow-up Hdwy	3.5	3.3	2.2 -
Pot Cap-1 Maneuver	*82	*645	815 -
Stage 1	*486	-	- -
Stage 2	*839	-	- -
Platoon blocked, %		1	1 -
Mov Cap-1 Maneuver	*82	*644	815 -
Mov Cap-2 Maneuver	*315	-	- -
Stage 1	*486	-	- -
Stage 2	*837	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	12.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	815	-	315	644	-	-
HCM Lane V/C Ratio	0.002	-	0.012	0.019	-	-
HCM Control Delay (s)	9.4	-	16.6	10.7	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0	0.1	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Timings

11: Waterman Av. & Driveway 2/Park Center Dr.

3/27/2017



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↕		↕	↕	↕	↑↑	↕	↕	↕↕
Traffic Volume (vph)	20	0	19	1	7	71	632	118	44	778
Future Volume (vph)	20	0	19	1	7	71	632	118	44	778
Turn Type	Perm	NA	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4		8		5	2		1	6
Permitted Phases	4		8		8	2		2	6	
Detector Phase	4	4	8	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	21.6	21.6	21.6	9.6	23.2	23.2	9.6	33.2
Total Split (s)	21.6	21.6	21.6	21.6	21.6	9.6	32.0	32.0	11.4	33.8
Total Split (%)	33.2%	33.2%	33.2%	33.2%	33.2%	14.8%	49.2%	49.2%	17.5%	52.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		4.6	4.6	4.6	6.2	6.2	4.6	6.2
Lead/Lag						Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)		11.4		11.4	11.4	47.4	45.0	45.0	49.4	41.9
Actuated g/C Ratio		0.18		0.18	0.18	0.73	0.69	0.69	0.76	0.64
v/c Ratio		0.15		0.08	0.02	0.22	0.31	0.11	0.04	0.44
Control Delay		0.9		21.6	0.1	5.5	8.8	2.6	4.1	9.9
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		0.9		21.6	0.1	5.5	8.8	2.6	4.1	9.9
LOS		A		C	A	A	A	A	A	A
Approach Delay		0.9		15.7			7.6			9.6
Approach LOS		A		B			A			A

Intersection Summary

Cycle Length: 65
 Actuated Cycle Length: 65
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.44
 Intersection Signal Delay: 8.6
 Intersection LOS: A
 Intersection Capacity Utilization 50.8%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 11: Waterman Av. & Driveway 2/Park Center Dr.



HCM Signalized Intersection Capacity Analysis
 11: Waterman Av. & Driveway 2/Park Center Dr.






















Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↕	↕	↕	↕↕	
Traffic Volume (vph)	20	0	22	19	1	7	71	632	118	44	778	49
Future Volume (vph)	20	0	22	19	1	7	71	632	118	44	778	49
Ideal Flow (vphp)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)		4.6			4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes		1.00			1.00	1.00	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.93			1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.98			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1635			1800	1800	1615	3600	1800	1700	3600	
Flt Permitted		0.84			0.70	1.00	0.24	1.00	1.00	0.35	1.00	
Satd. Flow (perm)		1398			1800	1800	401	3600	1800	1700	3600	
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	25	0	27	23	1	9	88	780	146	54	960	60
RTOR Reduction (vph)	0	46	0	0	0	8	0	0	59	0	5	0
Lane Group Flow (vph)	0	6	0	0	24	1	88	780	87	54	1015	0
Confl. Bikes (#/hr)									2			2
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		7.4			7.4	7.4	43.1	38.8	38.8	41.3	37.9	
Effective Green, g (s)		7.4			7.4	7.4	43.1	38.8	38.8	41.3	37.9	
Actuated g/C Ratio		0.11			0.11	0.11	0.66	0.60	0.60	0.64	0.58	
Clearance Time (s)		4.6			4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Vehicle Extension (s)		3.0			3.0	3.0	2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)		159			204	204	346	2148	1074	1080	2099	
v/s Ratio Prot							c0.02	0.22		0.00	c0.28	
v/s Ratio Perm		0.00			0.01	0.00	0.15		0.05	0.03		
v/c Ratio		0.04			0.12	0.01	0.25	0.36	0.08	0.05	0.48	
Uniform Delay, d1		25.6			25.9	25.5	4.3	6.7	5.5	4.5	7.9	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.1			0.3	0.0	0.1	0.5	0.1	0.0	0.8	
Delay (s)		25.7			26.1	25.5	4.4	7.2	5.7	4.5	8.7	
Level of Service		C			C	C	A	A	A	A	A	
Approach Delay (s)		25.7			26.0			6.8			8.5	
Approach LOS		C			C			A			A	

Intersection Summary		
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.41	A
Actuated Cycle Length (s)	65.0	Sum of lost time (s)
Intersection Capacity Utilization	50.8%	15.4
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		A

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	0	22	19	1	7	71	632	118	44	778	49
Future Volume (veh/h)	20	0	22	19	1	7	71	632	118	44	778	49
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	25	0	27	23	1	7	88	780	142	54	960	60
Adj No. of Lanes	0	1	0	0	1	1	1	2	1	1	2	0
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	145	24	94	277	10	183	427	2037	892	465	1901	119
Arrive On Green	0.12	0.00	0.12	0.12	0.12	0.12	0.06	0.60	0.60	0.05	0.58	0.58
Sat Flow, veh/h	529	203	791	1410	81	1530	1619	3420	1497	1619	3265	204
Grp Volume(v), veh/h	52	0	0	24	0	7	88	780	142	54	503	517
Grp Sat Flow(s),veh/h/ln	1523	0	0	1491	0	1530	1619	1710	1497	1619	1710	1759
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.3	1.3	7.8	2.8	0.8	11.3	11.3
Cycle Q Clear(g_c), s	1.9	0.0	0.0	0.8	0.0	0.3	1.3	7.8	2.8	0.8	11.3	11.3
Prop In Lane	0.48		0.52	0.96		1.00	1.00		1.00	1.00		0.12
Lane Grp Cap(c), veh/h	264	0	0	287	0	183	427	2037	892	465	996	1024
V/C Ratio(X)	0.20	0.00	0.00	0.08	0.00	0.04	0.21	0.38	0.16	0.12	0.50	0.50
Avail Cap(c_a), veh/h	474	0	0	488	0	400	452	2037	892	557	996	1024
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.0	0.0	0.0	25.6	0.0	25.3	5.5	6.9	5.9	5.0	8.0	8.0
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.1	0.0	0.1	0.1	0.5	0.4	0.0	1.8	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	0.4	0.0	0.1	0.6	3.7	1.2	0.4	5.8	6.0
LnGrp Delay(d),s/veh	26.4	0.0	0.0	25.7	0.0	25.4	5.6	7.4	6.3	5.0	9.9	9.8
LnGrp LOS	C			C		C	A	A	A	A	A	A
Approach Vol, veh/h		52			31			1010			1074	
Approach Delay, s/veh		26.4			25.6			7.1			9.6	
Approach LOS		C			C			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.7	44.9		12.4	8.6	44.1		12.4				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	6.8	25.8		17.0	5.0	27.6		17.0				
Max Q Clear Time (g_c+I1), s	2.8	9.8		3.9	3.3	13.3		2.8				
Green Ext Time (p_c), s	0.0	12.3		0.3	0.0	11.2		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay			9.1									
HCM 2010 LOS			A									

Timings
12: Waterman Av./Waterman Av. & Hospitality Ln.

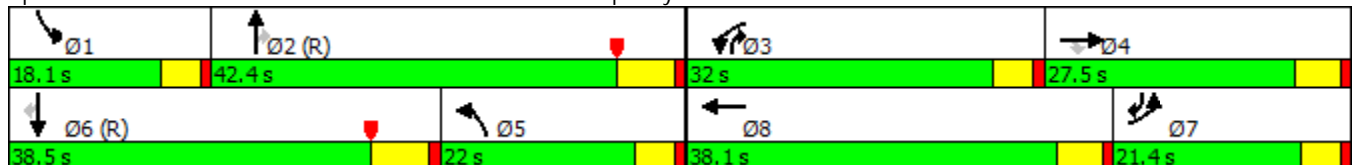


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↕	↘	↙↘	↕	↙↘	↕	↙↘	↙	↕↕	↘
Traffic Volume (vph)	158	183	129	359	399	284	829	802	90	452	148
Future Volume (vph)	158	183	129	359	399	284	829	802	90	452	148
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8	5	2	3	1	6	7
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	3	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	15.1	15.1	9.6	38.1	9.6	36.2	9.6	9.6	36.2	9.6
Total Split (s)	21.4	27.5	27.5	32.0	38.1	22.0	42.4	32.0	18.1	38.5	21.4
Total Split (%)	17.8%	22.9%	22.9%	26.7%	31.8%	18.3%	35.3%	26.7%	15.1%	32.1%	17.8%
Yellow Time (s)	3.6	4.1	4.1	3.6	4.1	3.6	5.2	3.6	3.6	5.2	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	5.1	4.6	5.1	4.6	6.2	4.6	4.6	6.2	4.6
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effect Green (s)	15.4	19.4	19.4	19.7	23.6	17.4	49.8	75.6	10.7	43.0	64.7
Actuated g/C Ratio	0.13	0.16	0.16	0.16	0.20	0.14	0.42	0.63	0.09	0.36	0.54
v/c Ratio	0.78	0.40	0.23	0.74	0.72	0.66	0.60	0.35	0.64	0.25	0.16
Control Delay	74.1	43.2	1.5	56.1	48.6	56.0	31.7	4.3	71.6	29.2	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.1	43.2	1.5	56.1	48.6	56.0	31.7	4.3	71.6	29.2	5.6
LOS	E	D	A	E	D	E	C	A	E	C	A
Approach Delay		45.3			51.8		23.8			29.7	
Approach LOS		D			D		C			C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 105
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 33.5
 Intersection LOS: C
 Intersection Capacity Utilization 79.6%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 12: Waterman Av./Waterman Av. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
 12: Waterman Av./Waterman Av. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)

3/27/2017


























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	158	183	129	359	399	91	284	829	802	90	452	148
Future Volume (vph)	158	183	129	359	399	91	284	829	802	90	452	148
Ideal Flow (vphpl)	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Lane Util. Factor	1.00	0.91	0.91	0.97	0.95		0.97	0.95	0.88	1.00	0.91	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	170	197	139	386	429	98	305	891	862	97	486	159
RTOR Reduction (vph)	0	13	85	0	18	0	0	0	231	0	0	60
Lane Group Flow (vph)	170	222	16	386	509	0	305	891	631	97	486	99
Confl. Peds. (#/hr)						9			1			3
Confl. Bikes (#/hr)						2			3			
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4						2			6
Actuated Green, G (s)	15.5	19.4	19.4	19.7	23.6		17.5	49.7	69.4	10.7	42.9	58.4
Effective Green, g (s)	15.5	19.4	19.4	19.7	23.6		17.5	49.7	69.4	10.7	42.9	58.4
Actuated g/C Ratio	0.13	0.16	0.16	0.16	0.20		0.15	0.41	0.58	0.09	0.36	0.49
Clearance Time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	4.0	2.0	2.0	4.0	2.0
Lane Grp Cap (vph)	219	582	291	525	708		466	1491	2082	151	1930	945
v/s Ratio Prot	c0.10	c0.06		0.12	c0.14		c0.10	c0.25	0.05	c0.06	0.09	0.01
v/s Ratio Perm			0.01						0.13			0.04
v/c Ratio	0.78	0.38	0.06	0.74	0.72		0.65	0.60	0.30	0.64	0.25	0.10
Uniform Delay, d1	50.6	44.9	42.6	47.7	45.1		48.4	27.4	12.9	52.8	27.2	16.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.5	0.4	0.1	4.6	3.5		2.5	1.8	0.0	6.8	0.3	0.0
Delay (s)	65.0	45.4	42.6	52.3	48.6		50.9	29.1	13.0	59.6	27.5	16.7
Level of Service	E	D	D	D	D		D	C	B	E	C	B
Approach Delay (s)		51.4			50.1			25.6			29.4	
Approach LOS		D			D			C			C	

Intersection Summary

HCM 2000 Control Delay	34.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	158	183	129	359	399	91	284	829	802	90	452	148
Future Volume (veh/h)	158	183	129	359	399	91	284	829	802	90	452	148
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	170	197	65	386	429	83	305	891	430	97	486	61
Adj No. of Lanes	1	2	1	2	2	0	2	2	2	1	3	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	199	622	264	441	555	107	665	1485	1543	118	1323	598
Arrive On Green	0.12	0.17	0.17	0.15	0.19	0.19	0.22	0.43	0.43	0.07	0.27	0.27
Sat Flow, veh/h	1619	3600	1530	2956	2849	546	2956	3420	2629	1619	4914	1525
Grp Volume(v), veh/h	170	197	65	386	256	256	305	891	430	97	486	61
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	1710	1685	1478	1710	1315	1619	1638	1525
Q Serve(g_s), s	12.4	5.7	2.7	15.3	17.0	17.3	10.7	23.9	9.8	7.1	9.6	0.0
Cycle Q Clear(g_c), s	12.4	5.7	2.7	15.3	17.0	17.3	10.7	23.9	9.8	7.1	9.6	0.0
Prop In Lane	1.00		1.00	1.00		0.32	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	199	622	264	441	333	329	665	1485	1543	118	1323	598
V/C Ratio(X)	0.86	0.32	0.25	0.88	0.77	0.78	0.46	0.60	0.28	0.82	0.37	0.10
Avail Cap(c_a), veh/h	227	672	286	675	470	463	665	1485	1543	182	1323	598
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.78	0.78	0.78	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.6	43.4	16.2	50.0	45.7	45.8	40.2	26.0	12.4	54.8	35.6	23.1
Incr Delay (d2), s/veh	21.8	0.3	0.5	4.4	3.8	4.3	0.2	1.8	0.4	8.8	0.8	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.7	2.9	1.2	6.5	8.4	8.4	4.4	11.6	3.6	3.5	4.5	1.3
LnGrp Delay(d),s/veh	73.3	43.7	16.7	54.3	49.6	50.1	40.4	27.8	12.9	63.6	36.4	23.5
LnGrp LOS	E	D	B	D	D	D	D	C	B	E	D	C
Approach Vol, veh/h		432			898			1626			644	
Approach Delay, s/veh		51.3			51.8			26.2			39.2	
Approach LOS		D			D			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.4	58.3	22.5	25.8	33.2	38.5	19.8	28.5				
Change Period (Y+Rc), s	4.6	6.2	4.6	5.1	6.2	* 6.2	5.1	* 5.1				
Max Green Setting (Gmax), s	13.5	36.2	27.4	22.4	17.4	* 32	16.8	* 33				
Max Q Clear Time (g_c+I1), s	9.1	25.9	17.3	7.7	12.7	11.6	14.4	19.3				
Green Ext Time (p_c), s	0.0	6.8	0.6	1.4	0.6	4.2	0.4	2.5				
Intersection Summary												
HCM 2010 Ctrl Delay			37.9									
HCM 2010 LOS			D									
Notes												

Intersection

Int Delay, s/veh 1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↘ ↗	↗ ↗	↗ ↗ ↗	
Traffic Vol, veh/h	0	0	281	1914	782	160
Future Vol, veh/h	0	0	281	1914	782	160
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	0	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	293	1994	815	167

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	407	815 0
Stage 1	-	-	- -
Stage 2	-	-	- -
Critical Hdwy	-	7.1	5.3 -
Critical Hdwy Stg 1	-	-	- -
Critical Hdwy Stg 2	-	-	- -
Follow-up Hdwy	-	3.9	3.1 -
Pot Cap-1 Maneuver	0	*745	*937 -
Stage 1	0	-	- -
Stage 2	0	-	- -
Platoon blocked, %	-	1	1 -
Mov Cap-1 Maneuver	-	*745	*937 -
Mov Cap-2 Maneuver	-	-	- -
Stage 1	-	-	- -
Stage 2	-	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	0	1.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	* 937	-	-	-	-
HCM Lane V/C Ratio	0.312	-	-	-	-
HCM Control Delay (s)	10.6	-	0	-	-
HCM Lane LOS	B	-	A	-	-
HCM 95th %tile Q(veh)	1.3	-	-	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations						↗		↑↑			↑↑	
Traffic Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Future Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	-	-	-	Free	-	-	-	-	-	None
Storage Length	-	-	-	-	-	0	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	1209	0	998	0	0	746	171

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	0	0	0
Stage 1	0	0	0
Stage 2	0	0	0
Platoon blocked, %			
Mov Cap-1 Maneuver	-	0	-
Mov Cap-2 Maneuver	-	0	-
Stage 1	-	0	-
Stage 2	-	0	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBTWBLn1	SBT	SBR
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	-	0	-
HCM Lane LOS	-	A	-
HCM 95th %tile Q(veh)	-	-	-

Intersection

Int Delay, s/veh

Movement	NWL	NWR
Lane Configurations		
Traffic Vol, veh/h	0	0
Future Vol, veh/h	0	0
Conflicting Peds, #/hr	0	0
Sign Control	Stop	Stop
RT Channelized	-	-
Storage Length	-	-
Veh in Median Storage, #	0	-
Grade, %	0	-
Peak Hour Factor	95	95
Heavy Vehicles, %	0	0
Mvmt Flow	0	0

Major/Minor

Conflicting Flow All

Stage 1

Stage 2

Critical Hdwy

Critical Hdwy Stg 1

Critical Hdwy Stg 2

Follow-up Hdwy

Pot Cap-1 Maneuver

Stage 1

Stage 2

Platoon blocked, %

Mov Cap-1 Maneuver

Mov Cap-2 Maneuver

Stage 1

Stage 2

Approach

HCM Control Delay, s

HCM LOS

Minor Lane/Major Mvmt

Timings

15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.

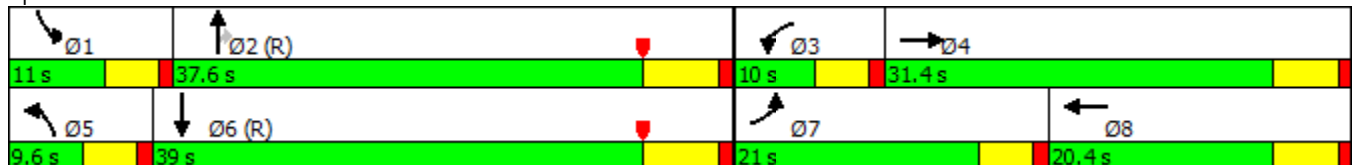


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖↖	↕↗	↖	↕↗	↖	↕↕	↗	↖	↕↗
Traffic Volume (vph)	471	367	108	221	39	760	110	73	396
Future Volume (vph)	471	367	108	221	39	760	110	73	396
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	9.6	31.4	9.6	15.4	9.6	36.2	36.2	9.6	36.2
Total Split (s)	21.0	31.4	10.0	20.4	9.6	37.6	37.6	11.0	39.0
Total Split (%)	23.3%	34.9%	11.1%	22.7%	10.7%	41.8%	41.8%	12.2%	43.3%
Yellow Time (s)	3.6	4.4	3.6	4.4	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	5.4	4.6	6.2	6.2	4.6	6.2
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)	15.9	22.7	5.4	12.2	5.7	36.0	36.0	7.1	39.4
Actuated g/C Ratio	0.18	0.25	0.06	0.14	0.06	0.40	0.40	0.08	0.44
v/c Ratio	0.87	0.61	1.11	0.61	0.38	0.55	0.14	0.57	0.37
Control Delay	53.5	24.2	163.5	33.2	51.0	24.0	0.5	58.2	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.5	24.2	163.5	33.2	51.0	24.0	0.5	58.2	16.4
LOS	D	C	F	C	D	C	A	E	B
Approach Delay		37.1		65.9		22.3			21.1
Approach LOS		D		E		C			C

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.11
 Intersection Signal Delay: 33.4
 Intersection LOS: C
 Intersection Capacity Utilization 72.8%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.

























HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 15: Waterman Av./Waterman Av. & Redlands Bl./Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔	↕↔		↔	↕↕	↔	↔	↕↔	
Traffic Volume (vph)	471	367	233	108	221	104	39	760	110	73	396	179
Future Volume (vph)	471	367	233	108	221	104	39	760	110	73	396	179
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.94		1.00	0.95		1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Flt Permitted	1.00	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	491	382	243	112	230	108	41	792	115	76	412	186
RTOR Reduction (vph)	0	119	0	0	64	0	0	0	70	0	53	0
Lane Group Flow (vph)	491	506	0	113	274	0	41	792	45	76	546	0
Confl. Peds. (#/hr)			3						1			4
Confl. Bikes (#/hr)			1						1			
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	15.9	22.7		5.4	12.2		3.6	35.1	35.1	6.0	37.5	
Effective Green, g (s)	15.9	22.7		5.4	12.2		3.6	35.1	35.1	6.0	37.5	
Actuated g/C Ratio	0.18	0.25		0.06	0.14		0.04	0.39	0.39	0.07	0.42	
Clearance Time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	565	908		102	488		68	1404	702	113	1500	
v/s Ratio Prot	c0.15	c0.14		0.07	0.08		0.02	c0.22		c0.04	0.15	
v/s Ratio Perm									0.02			
v/c Ratio	0.87	0.56		1.11	0.56		0.60	0.56	0.06	0.67	0.36	
Uniform Delay, d1	36.0	29.3		42.3	36.4		42.5	21.5	17.2	41.0	18.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	13.0	0.7		121.1	1.5		9.9	1.6	0.2	11.7	0.7	
Delay (s)	49.0	30.0		163.4	37.9		52.4	23.1	17.3	52.7	18.7	
Level of Service	D	C		F	D		D	C	B	D	B	
Approach Delay (s)		38.4			69.3			23.7			22.6	
Approach LOS		D			E			C			C	

Intersection Summary		
HCM 2000 Control Delay	35.0	HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio	0.66	
Actuated Cycle Length (s)	90.0	Sum of lost time (s) 20.8
Intersection Capacity Utilization	72.8%	ICU Level of Service C
Analysis Period (min)	15	

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	471	367	233	108	221	104	39	760	110	73	396	179
Future Volume (veh/h)	471	367	233	108	221	104	39	760	110	73	396	179
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	491	382	189	112	230	83	41	792	73	76	412	131
Adj No. of Lanes	2	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	539	575	280	97	341	120	58	1338	590	94	1059	333
Arrive On Green	0.18	0.26	0.26	0.06	0.14	0.14	0.04	0.39	0.39	0.06	0.41	0.41
Sat Flow, veh/h	2956	2218	1080	1619	2484	872	1619	3420	1510	1619	2560	805
Grp Volume(v), veh/h	491	293	278	112	156	157	41	792	73	76	274	269
Grp Sat Flow(s),veh/h/ln	1478	1710	1588	1619	1710	1646	1619	1710	1510	1619	1710	1655
Q Serve(g_s), s	14.7	13.8	14.1	5.4	7.8	8.2	2.3	16.5	2.8	4.2	10.1	10.2
Cycle Q Clear(g_c), s	14.7	13.8	14.1	5.4	7.8	8.2	2.3	16.5	2.8	4.2	10.1	10.2
Prop In Lane	1.00		0.68	1.00		0.53	1.00		1.00	1.00		0.49
Lane Grp Cap(c), veh/h	539	444	412	97	235	226	58	1338	590	94	708	685
V/C Ratio(X)	0.91	0.66	0.67	1.15	0.67	0.69	0.71	0.59	0.12	0.80	0.39	0.39
Avail Cap(c_a), veh/h	539	494	459	97	285	274	90	1338	590	115	708	685
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.84	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.1	29.8	29.9	42.3	36.9	37.0	42.9	21.7	17.5	41.9	18.4	18.5
Incr Delay (d2), s/veh	17.0	2.4	2.9	138.3	4.3	5.7	5.9	1.9	0.4	23.2	1.6	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	6.8	6.5	6.1	4.0	4.1	1.1	8.2	1.2	2.5	5.0	5.0
LnGrp Delay(d),s/veh	53.1	32.2	32.8	180.6	41.2	42.7	48.8	23.6	18.0	65.1	20.0	20.2
LnGrp LOS	D	C	C	F	D	D	D	C	B	E	C	C
Approach Vol, veh/h		1062			425			906			619	
Approach Delay, s/veh		42.0			78.5			24.3			25.6	
Approach LOS		D			E			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.9	41.4	10.0	28.8	7.8	43.4	21.0	17.8				
Change Period (Y+Rc), s	4.6	6.2	4.6	5.4	4.6	6.2	4.6	5.4				
Max Green Setting (Gmax), s	6.4	31.4	5.4	26.0	5.0	32.8	16.4	15.0				
Max Q Clear Time (g_c+I1), s	6.2	18.5	7.4	16.1	4.3	12.2	16.7	10.2				
Green Ext Time (p_c), s	0.0	8.2	0.0	3.6	0.0	11.3	0.0	2.2				
Intersection Summary												
HCM 2010 Ctrl Delay			38.5									
HCM 2010 LOS			D									

Timings
 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

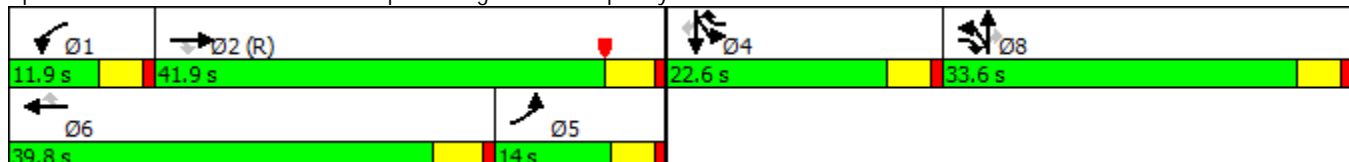


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	175	57	42	101	593	340	620	182	8	366	85
Future Volume (vph)	80	175	57	42	101	593	340	620	182	8	366	85
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	8	1	6	4	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	39.1	33.6	9.6	39.1	22.6	33.6	33.6	33.6	22.6	22.6	22.6
Total Split (s)	14.0	41.9	33.6	11.9	39.8	22.6	33.6	33.6	33.6	22.6	22.6	22.6
Total Split (%)	12.7%	38.1%	30.5%	10.8%	36.2%	20.5%	30.5%	30.5%	30.5%	20.5%	20.5%	20.5%
Yellow Time (s)	3.6	4.1	3.6	3.6	4.1	3.6	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	C-Max	Max	None	None	Max	Max	Max	Max	Max	Max	Max
Act Effect Green (s)	23.4	42.0	73.3	6.0	22.7	41.2	29.0	29.0	29.0	18.0	18.0	18.0
Actuated g/C Ratio	0.21	0.38	0.67	0.05	0.21	0.37	0.26	0.26	0.26	0.16	0.16	0.16
v/c Ratio	0.23	0.13	0.05	0.25	0.41	0.52	0.70	0.70	0.31	0.03	0.63	0.20
Control Delay	38.1	23.8	1.2	53.0	11.9	12.9	46.0	41.4	8.1	39.1	48.4	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.1	23.8	1.2	53.0	11.9	12.9	46.0	41.4	8.1	39.1	48.4	1.1
LOS	D	C	A	D	B	B	D	D	A	D	D	A
Approach Delay		23.4			14.7			37.3			39.4	
Approach LOS		C			B			D			D	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:EBT, Start of Yellow
 Natural Cycle: 105
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 29.7
 Intersection LOS: C
 Intersection Capacity Utilization 77.9%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)

3/30/2017



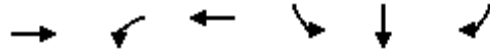
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	175	57	42	101	593	340	620	182	8	366	85
Future Volume (vph)	80	175	57	42	101	593	340	620	182	8	366	85
Ideal Flow (vphpl)	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lane Util. Factor	1.00	0.95	1.00	0.97	0.91	0.91	0.91	0.91	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.89	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600	1383	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600	1383	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	82	179	58	43	103	605	347	633	186	8	373	87
RTOR Reduction (vph)	0	0	22	0	246	69	0	0	123	0	0	73
Lane Group Flow (vph)	82	179	36	43	160	233	312	668	63	8	373	14
Confl. Peds. (#/hr)			2			1						
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	23.3	40.1	69.1	4.0	20.8	38.8	29.0	29.0	29.0	18.0	18.0	18.0
Effective Green, g (s)	23.3	40.1	69.1	4.0	20.8	38.8	29.0	29.0	29.0	18.0	18.0	18.0
Actuated g/C Ratio	0.21	0.36	0.63	0.04	0.19	0.35	0.26	0.26	0.26	0.16	0.16	0.16
Clearance Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	360	1312	1130	116	680	487	448	949	474	278	589	294
v/s Ratio Prot	c0.05	0.05	0.01	0.01	0.04	c0.08	0.18	c0.19		0.00	c0.10	
v/s Ratio Perm			0.01			0.09			0.04			0.01
v/c Ratio	0.23	0.14	0.03	0.37	0.24	0.48	0.70	0.70	0.13	0.03	0.63	0.05
Uniform Delay, d1	35.9	23.4	7.8	51.8	37.9	27.7	36.5	36.6	30.9	38.7	42.9	38.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.2	0.1	0.7	0.2	0.7	8.7	4.4	0.6	0.2	5.1	0.3
Delay (s)	36.0	23.6	7.8	52.5	38.0	28.5	45.2	41.0	31.5	38.8	48.0	39.1
Level of Service	D	C	A	D	D	C	D	D	C	D	D	D
Approach Delay (s)		23.9			35.0			40.6			46.2	
Approach LOS		C			D			D			D	

Intersection Summary		
HCM 2000 Control Delay	38.1	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.52	D
Actuated Cycle Length (s)	110.0	Sum of lost time (s)
Intersection Capacity Utilization	77.9%	18.9
Analysis Period (min)	15	ICU Level of Service
		D

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	175	57	42	101	593	340	620	182	8	366	85
Future Volume (veh/h)	80	175	57	42	101	593	340	620	182	8	366	85
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	82	179	41	43	103	593	327	661	146	8	373	69
Adj No. of Lanes	1	2	1	2	1	2	1	2	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	315	1257	958	101	363	1117	427	949	403	265	560	250
Arrive On Green	0.19	0.37	0.37	0.03	0.20	0.20	0.26	0.26	0.26	0.16	0.16	0.16
Sat Flow, veh/h	1619	3420	1508	3048	1800	3052	1619	3600	1530	1619	3420	1530
Grp Volume(v), veh/h	82	179	41	43	103	593	327	661	146	8	373	69
Grp Sat Flow(s),veh/h/ln	1619	1710	1508	1524	1800	1526	1619	1800	1530	1619	1710	1530
Q Serve(g_s), s	4.7	3.8	1.1	1.5	5.3	16.8	20.5	18.2	8.5	0.5	11.3	4.3
Cycle Q Clear(g_c), s	4.7	3.8	1.1	1.5	5.3	16.8	20.5	18.2	8.5	0.5	11.3	4.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	315	1257	958	101	363	1117	427	949	403	265	560	250
V/C Ratio(X)	0.26	0.14	0.04	0.42	0.28	0.53	0.77	0.70	0.36	0.03	0.67	0.28
Avail Cap(c_a), veh/h	315	1257	958	202	568	1464	427	949	403	265	560	250
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.6	23.2	7.7	52.1	37.2	27.5	37.4	36.5	33.0	38.7	43.2	40.3
Incr Delay (d2), s/veh	0.2	0.2	0.1	1.0	0.4	0.4	12.4	4.2	2.5	0.2	6.2	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	1.9	0.8	0.7	2.7	9.0	10.6	9.6	3.9	0.2	5.8	2.0
LnGrp Delay(d),s/veh	37.7	23.4	7.8	53.2	37.6	27.9	49.7	40.8	35.5	38.9	49.4	43.0
LnGrp LOS	D	C	A	D	D	C	D	D	D	D	D	D
Approach Vol, veh/h		302			739			1134			450	
Approach Delay, s/veh		25.2			30.7			42.7			48.2	
Approach LOS		C			C			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.3	45.5		22.6	26.5	27.3		33.6				
Change Period (Y+Rc), s	4.6	5.1		4.6	5.1	* 5.1		4.6				
Max Green Setting (Gmax), s	7.3	36.8		18.0	9.4	* 35		29.0				
Max Q Clear Time (g_c+I1), s	3.5	5.8		13.3	6.7	18.8		22.5				
Green Ext Time (p_c), s	0.0	1.3		1.2	0.3	2.8		3.0				
Intersection Summary												
HCM 2010 Ctrl Delay			38.2									
HCM 2010 LOS			D									
Notes												

Timings
1: I-215 SB Ramps & Auto Center Rd.

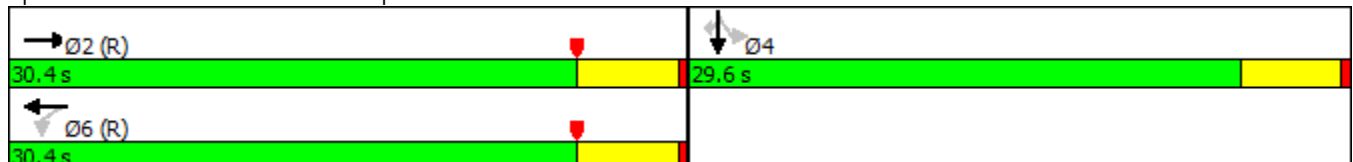


Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Configurations	↑↑		↑↑	↘	↙	↗
Traffic Volume (vph)	439	8	320	566	101	268
Future Volume (vph)	439	8	320	566	101	268
Turn Type	NA	Perm	NA	Perm	NA	Perm
Protected Phases	2		6		4	
Permitted Phases		6		4		4
Detector Phase	2	6	6	4	4	4
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	30.0	22.5	22.5	22.5	22.5	22.5
Total Split (s)	30.4	30.4	30.4	29.6	29.6	29.6
Total Split (%)	50.7%	50.7%	50.7%	49.3%	49.3%	49.3%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0		5.0	5.0	5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	Max	Max	Max
Act Effct Green (s)	25.4		25.4	24.6	24.6	24.6
Actuated g/C Ratio	0.42		0.42	0.41	0.41	0.41
v/c Ratio	0.40		0.22	0.49	0.48	0.31
Control Delay	10.5		6.2	16.1	15.7	2.8
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	10.5		6.2	16.1	15.7	2.8
LOS	B		A	B	B	A
Approach Delay	10.5		6.2		12.2	
Approach LOS	B		A		B	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 50 (83%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.49
 Intersection Signal Delay: 10.6
 Intersection LOS: B
 Intersection Capacity Utilization 48.5%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 1: I-215 SB Ramps & Auto Center Rd.



HCM Signalized Intersection Capacity Analysis
 1: I-215 SB Ramps & Auto Center Rd.

Gateway South Building 4 TIA (JN 10187)


















3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑					↘	↗	↗
Traffic Volume (vph)	0	439	174	8	320	0	0	0	0	566	101	268
Future Volume (vph)	0	439	174	8	320	0	0	0	0	566	101	268
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		5.0			5.0					5.0	5.0	5.0
Lane Util. Factor		0.95			0.95					0.95	0.95	1.00
Frbp, ped/bikes		0.99			1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00			1.00					1.00	1.00	1.00
Frt		0.96			1.00					1.00	1.00	0.85
Flt Protected		1.00			1.00					0.95	0.97	1.00
Satd. Flow (prot)		3600			3600					1700	1800	1800
Flt Permitted		1.00			0.94					0.95	0.97	1.00
Satd. Flow (perm)		3600			3600					1700	1800	1800
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	457	181	8	333	0	0	0	0	590	105	279
RTOR Reduction (vph)	0	70	0	0	0	0	0	0	0	0	0	165
Lane Group Flow (vph)	0	568	0	0	341	0	0	0	0	342	353	114
Confl. Peds. (#/hr)			1									
Confl. Bikes (#/hr)			1									
Turn Type		NA		Perm	NA					Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases				6						4		4
Actuated Green, G (s)		25.4			25.4					24.6	24.6	24.6
Effective Green, g (s)		25.4			25.4					24.6	24.6	24.6
Actuated g/C Ratio		0.42			0.42					0.41	0.41	0.41
Clearance Time (s)		5.0			5.0					5.0	5.0	5.0
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1524			1524					697	738	738
v/s Ratio Prot		c0.16										
v/s Ratio Perm					0.09					c0.20	0.20	0.06
v/c Ratio		0.37			0.22					0.49	0.48	0.16
Uniform Delay, d1		11.8			11.0					13.1	13.0	11.2
Progression Factor		1.00			0.54					1.00	1.00	1.00
Incremental Delay, d2		0.7			0.3					2.5	2.2	0.4
Delay (s)		12.5			6.2					15.5	15.2	11.6
Level of Service		B			A					B	B	B
Approach Delay (s)		12.5			6.2			0.0			14.3	
Approach LOS		B			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	48.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	439	174	8	320	0	0	0	0	566	101	268
Future Volume (veh/h)	0	439	174	8	320	0	0	0	0	566	101	268
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1800	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	457	130	8	333	0				665	0	158
Adj No. of Lanes	0	2	0	0	2	0				2	0	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1109	313	71	1403	0				1328	0	627
Arrive On Green	0.00	0.42	0.42	0.85	0.85	0.00				0.41	0.00	0.41
Sat Flow, veh/h	0	2711	739	20	3395	0				3238	0	1530
Grp Volume(v), veh/h	0	297	290	183	158	0				665	0	158
Grp Sat Flow(s),veh/h/ln	0	1710	1650	1777	1556	0				1619	0	1530
Q Serve(g_s), s	0.0	7.3	7.4	0.0	1.2	0.0				9.1	0.0	4.1
Cycle Q Clear(g_c), s	0.0	7.3	7.4	1.2	1.2	0.0				9.1	0.0	4.1
Prop In Lane	0.00		0.45	0.04		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	724	698	815	659	0				1328	0	627
V/C Ratio(X)	0.00	0.41	0.42	0.22	0.24	0.00				0.50	0.00	0.25
Avail Cap(c_a), veh/h	0	724	698	815	659	0				1328	0	627
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	12.1	12.1	2.7	2.7	0.0				13.1	0.0	11.6
Incr Delay (d2), s/veh	0.0	1.7	1.8	0.6	0.9	0.0				1.4	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.7	3.7	0.7	0.6	0.0				4.3	0.0	1.9
LnGrp Delay(d),s/veh	0.0	13.8	13.9	3.4	3.6	0.0				14.5	0.0	12.6
LnGrp LOS		B	B	A	A					B		B
Approach Vol, veh/h		587			341						823	
Approach Delay, s/veh		13.9			3.5						14.1	
Approach LOS		B			A						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		30.4		29.6		30.4						
Change Period (Y+Rc), s		5.0		5.0		5.0						
Max Green Setting (Gmax), s		25.4		24.6		25.4						
Max Q Clear Time (g_c+I1), s		9.4		11.1		3.2						
Green Ext Time (p_c), s		4.8		2.6		5.5						
Intersection Summary												
HCM 2010 Ctrl Delay			12.0									
HCM 2010 LOS			B									
Notes												

Timings

2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations	↶	↷	↶	↷	↶	↷	↷
Traffic Volume (vph)	222	783	862	662	116	7	920
Future Volume (vph)	222	783	862	662	116	7	920
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm
Protected Phases	5	2	6		8	8	
Permitted Phases				6			8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	8.0	8.0	8.0	5.0	5.0	5.0
Minimum Split (s)	8.5	39.0	13.0	13.0	10.0	10.0	10.0
Total Split (s)	9.8	39.0	29.2	29.2	21.0	21.0	21.0
Total Split (%)	16.3%	65.0%	48.7%	48.7%	35.0%	35.0%	35.0%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max
Act Effct Green (s)	6.3	34.0	24.2	24.2	16.0	16.0	16.0
Actuated g/C Ratio	0.10	0.57	0.40	0.40	0.27	0.27	0.27
v/c Ratio	1.28	0.39	0.61	0.60	0.14	0.13	0.80
Control Delay	184.5	4.9	11.8	3.8	17.8	17.7	20.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Total Delay	184.5	4.9	11.8	3.8	17.8	17.7	20.4
LOS	F	A	B	A	B	B	C
Approach Delay		44.6	8.3			20.0	
Approach LOS		D	A			C	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 43 (72%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.28
 Intersection Signal Delay: 22.0
 Intersection LOS: C
 Intersection Capacity Utilization 72.8%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.
























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↗	↗↗			
Traffic Volume (vph)	222	783	0	0	862	662	116	7	920	0	0	0
Future Volume (vph)	222	783	0	0	862	662	116	7	920	0	0	0
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800	1700	1800	1800	1800	1800	1800
Total Lost time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	0.88			
Frbp, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.96	1.00			
Satd. Flow (prot)	1700	3600			3600	1800	1700	1800	3600			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.96	1.00			
Satd. Flow (perm)	1700	3600			3600	1800	1700	1800	3600			
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	227	799	0	0	880	676	118	7	939	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	403	0	0	220	0	0	0
Lane Group Flow (vph)	227	799	0	0	880	273	63	62	719	0	0	0
Confl. Peds. (#/hr)			1									
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	6.3	34.0			24.2	24.2	16.0	16.0	16.0			
Effective Green, g (s)	6.3	34.0			24.2	24.2	16.0	16.0	16.0			
Actuated g/C Ratio	0.10	0.57			0.40	0.40	0.27	0.27	0.27			
Clearance Time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Vehicle Extension (s)	2.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	178	2040			1452	726	453	480	960			
v/s Ratio Prot	c0.13	0.22			c0.24		0.04	0.03				
v/s Ratio Perm						0.15			c0.20			
v/c Ratio	1.28	0.39			0.61	0.38	0.14	0.13	0.75			
Uniform Delay, d1	26.9	7.2			14.1	12.6	16.8	16.7	20.2			
Progression Factor	0.85	0.59			0.74	2.35	1.00	1.00	1.00			
Incremental Delay, d2	157.5	0.5			1.2	1.0	0.6	0.6	5.3			
Delay (s)	180.3	4.8			11.7	30.5	17.4	17.3	25.5			
Level of Service	F	A			B	C	B	B	C			
Approach Delay (s)		43.6			19.9			24.5			0.0	
Approach LOS		D			B			C			A	

Intersection Summary			
HCM 2000 Control Delay	27.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	222	783	0	0	862	662	116	7	920	0	0	0
Future Volume (veh/h)	222	783	0	0	862	662	116	7	920	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1700	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	227	799	0	0	880	472	123	0	605			
Adj No. of Lanes	1	2	0	0	2	1	2	0	2			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	170	1938	0	0	1379	617	863	0	816			
Arrive On Green	0.11	0.57	0.00	0.00	0.40	0.40	0.27	0.00	0.27			
Sat Flow, veh/h	1619	3510	0	0	3510	1530	3238	0	3060			
Grp Volume(v), veh/h	227	799	0	0	880	472	123	0	605			
Grp Sat Flow(s),veh/h/ln	1619	1710	0	0	1710	1530	1619	0	1530			
Q Serve(g_s), s	6.3	7.9	0.0	0.0	12.4	16.0	1.7	0.0	10.8			
Cycle Q Clear(g_c), s	6.3	7.9	0.0	0.0	12.4	16.0	1.7	0.0	10.8			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	170	1938	0	0	1379	617	863	0	816			
V/C Ratio(X)	1.34	0.41	0.00	0.00	0.64	0.76	0.14	0.00	0.74			
Avail Cap(c_a), veh/h	170	1938	0	0	1379	617	863	0	816			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.50	0.50	1.00	0.00	1.00			
Uniform Delay (d), s/veh	26.9	7.4	0.0	0.0	14.4	15.4	16.8	0.0	20.1			
Incr Delay (d2), s/veh	185.2	0.6	0.0	0.0	1.1	4.6	0.3	0.0	6.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	11.5	3.8	0.0	0.0	6.0	7.5	0.8	0.0	5.2			
LnGrp Delay(d),s/veh	212.1	8.0	0.0	0.0	15.5	20.0	17.1	0.0	26.1			
LnGrp LOS	F	A			B	C	B		C			
Approach Vol, veh/h		1026			1352			728				
Approach Delay, s/veh		53.2			17.1			24.6				
Approach LOS		D			B			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		39.0			9.8	29.2		21.0				
Change Period (Y+Rc), s		5.0			3.5	5.0		5.0				
Max Green Setting (Gmax), s		34.0			6.3	24.2		16.0				
Max Q Clear Time (g_c+I1), s		9.9			8.3	18.0		12.8				
Green Ext Time (p_c), s		14.7			0.0	5.1		1.0				
Intersection Summary												
HCM 2010 Ctrl Delay			30.8									
HCM 2010 LOS			C									
Notes												

Timings
3: E St. & Orange Show Rd.

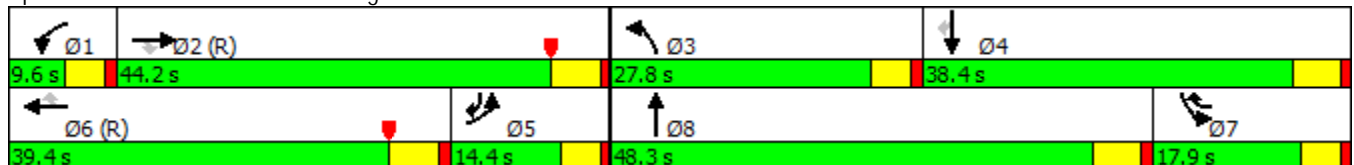


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑	↗	↔↔	↑↑	↗	↗	↑↑	↔↔	↑↑	↗
Traffic Volume (vph)	230	1121	344	147	888	124	307	374	221	260	250
Future Volume (vph)	230	1121	344	147	888	124	307	374	221	260	250
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8	7	4	5
Permitted Phases			2			6					4
Detector Phase	5	2	2	1	6	7	3	8	7	4	5
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0
Minimum Split (s)	9.6	39.4	39.4	9.6	39.4	9.6	9.6	38.4	9.6	38.4	9.6
Total Split (s)	14.4	44.2	44.2	9.6	39.4	17.9	27.8	48.3	17.9	38.4	14.4
Total Split (%)	12.0%	36.8%	36.8%	8.0%	32.8%	14.9%	23.2%	40.3%	14.9%	32.0%	12.0%
Yellow Time (s)	3.6	4.4	4.4	3.6	4.4	3.6	3.6	4.4	3.6	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4	4.6	5.4	4.6
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	Max	None	Max	None
Act Effct Green (s)	9.8	38.8	38.8	5.0	34.0	52.7	23.2	42.9	13.3	33.0	43.6
Actuated g/C Ratio	0.08	0.32	0.32	0.04	0.28	0.44	0.19	0.36	0.11	0.28	0.36
v/c Ratio	0.92	1.00	0.46	1.15	0.91	0.15	1.04	0.41	0.65	0.27	0.36
Control Delay	89.2	66.6	11.5	152.5	55.8	8.7	108.2	27.2	60.4	35.0	9.8
Queue Delay	0.0	7.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.2	73.8	11.5	152.5	55.8	8.7	108.2	27.2	60.4	35.0	9.8
LOS	F	E	B	F	E	A	F	C	E	D	A
Approach Delay		63.3			63.0			57.4		34.1	
Approach LOS		E			E			E		C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 108 (90%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.15
 Intersection Signal Delay: 57.3
 Intersection LOS: E
 Intersection Capacity Utilization 102.1%
 ICU Level of Service G
 Analysis Period (min) 15































Splits and Phases: 3: E St. & Orange Show Rd.



























HCM Signalized Intersection Capacity Analysis
3: E St. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	 	 		 	 			 		 	 		
Traffic Volume (vph)	230	1121	344	147	888	124	307	374	142	221	260	250	
Future Volume (vph)	230	1121	344	147	888	124	307	374	142	221	260	250	
Ideal Flow (vphp)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800	
Total Lost time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95		0.97	0.95	1.00	
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	3200	3600	1800	3200	3600	1800	1600	3600		3200	3600	1800	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	3200	3600	1800	3200	3600	1800	1600	3600		3200	3600	1800	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	240	1168	358	153	925	129	320	390	148	230	271	260	
RTOR Reduction (vph)	0	0	192	0	0	68	0	33	0	0	0	68	
Lane Group Flow (vph)	240	1168	166	153	925	61	320	505	0	230	271	192	
Confl. Peds. (#/hr)									2			2	
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov	
Protected Phases	5	2		1	6	7	3	8		7	4	5	
Permitted Phases			2			6						4	
Actuated Green, G (s)	9.8	38.8	38.8	5.0	34.0	47.3	23.2	42.9		13.3	33.0	42.8	
Effective Green, g (s)	9.8	38.8	38.8	5.0	34.0	47.3	23.2	42.9		13.3	33.0	42.8	
Actuated g/C Ratio	0.08	0.32	0.32	0.04	0.28	0.39	0.19	0.36		0.11	0.28	0.36	
Clearance Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6	
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	2.0	2.0	3.0		2.0	3.0	2.0	
Lane Grp Cap (vph)	261	1164	582	133	1020	778	309	1287		354	990	642	
v/s Ratio Prot	0.07	c0.32		0.05	c0.26	0.01	c0.20	c0.14		c0.07	0.08	0.02	
v/s Ratio Perm			0.09			0.03						0.08	
v/c Ratio	0.92	1.00	0.28	1.15	0.91	0.08	1.04	0.39		0.65	0.27	0.30	
Uniform Delay, d1	54.7	40.6	30.3	57.5	41.5	22.7	48.4	28.8		51.1	34.1	27.8	
Progression Factor	1.02	1.04	1.36	0.79	1.11	1.71	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2	29.3	24.5	1.0	110.2	9.4	0.0	60.7	0.9		3.1	0.7	0.1	
Delay (s)	85.3	66.6	42.0	155.4	55.5	39.0	109.1	29.7		54.2	34.8	27.9	
Level of Service	F	E	D	F	E	D	F	C		D	C	C	
Approach Delay (s)		64.2			66.4			59.3			38.3		
Approach LOS		E			E			E			D		
Intersection Summary													
HCM 2000 Control Delay			59.6									HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio			0.85										
Actuated Cycle Length (s)			120.0									Sum of lost time (s)	20.0
Intersection Capacity Utilization			102.1%									ICU Level of Service	G
Analysis Period (min)			15										
c Critical Lane Group													

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	1121	344	147	888	124	307	374	142	221	260	250
Future Volume (veh/h)	230	1121	344	147	888	124	307	374	142	221	260	250
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	240	1168	182	153	925	73	320	390	117	230	271	153
Adj No. of Lanes	2	2	1	2	2	1	1	2	0	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	610	1555	696	123	969	593	295	930	276	308	940	736
Arrive On Green	0.41	0.91	0.91	0.01	0.09	0.09	0.19	0.36	0.36	0.10	0.28	0.28
Sat Flow, veh/h	2956	3420	1530	2956	3420	1530	1524	2601	771	2956	3420	1527
Grp Volume(v), veh/h	240	1168	182	153	925	73	320	255	252	230	271	153
Grp Sat Flow(s),veh/h/ln	1478	1710	1530	1478	1710	1530	1524	1710	1662	1478	1710	1527
Q Serve(g_s), s	6.8	11.7	1.7	5.0	32.3	0.0	23.2	13.5	13.8	9.1	7.5	3.1
Cycle Q Clear(g_c), s	6.8	11.7	1.7	5.0	32.3	0.0	23.2	13.5	13.8	9.1	7.5	3.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.46	1.00		1.00
Lane Grp Cap(c), veh/h	610	1555	696	123	969	593	295	611	594	308	941	736
V/C Ratio(X)	0.39	0.75	0.26	1.24	0.95	0.12	1.09	0.42	0.42	0.75	0.29	0.21
Avail Cap(c_a), veh/h	610	1555	696	123	969	593	295	611	594	328	941	736
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.76	0.76	0.76	0.61	0.61	0.61	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.0	3.5	3.0	59.2	53.6	30.3	48.4	29.1	29.2	52.2	34.3	10.8
Incr Delay (d2), s/veh	0.1	2.6	0.7	143.7	14.1	0.3	77.4	2.1	2.2	7.3	0.8	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	5.4	0.8	4.5	17.2	2.0	16.1	6.7	6.7	4.0	3.6	2.0
LnGrp Delay(d),s/veh	30.1	6.1	3.7	202.8	67.7	30.6	125.8	31.2	31.4	59.5	35.0	11.4
LnGrp LOS	C	A	A	F	E	C	F	C	C	E	D	B
Approach Vol, veh/h		1590			1151			827			654	
Approach Delay, s/veh		9.4			83.3			67.9			38.1	
Approach LOS		A			F			E			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.6	60.1	27.8	38.4	30.3	39.4	17.9	48.3				
Change Period (Y+Rc), s	4.6	5.4	4.6	5.4	5.4	* 5.4	5.4	* 5.4				
Max Green Setting (Gmax), s	5.0	38.8	23.2	33.0	9.8	* 34	13.3	* 43				
Max Q Clear Time (g_c+I1), s	7.0	13.7	25.2	9.5	8.8	34.3	11.1	15.8				
Green Ext Time (p_c), s	0.0	13.8	0.0	2.5	0.3	0.0	0.6	3.0				
Intersection Summary												
HCM 2010 Ctrl Delay			45.5									
HCM 2010 LOS			D									
Notes												

Timings
4: Arrowhead Av. & Orange Show Rd.

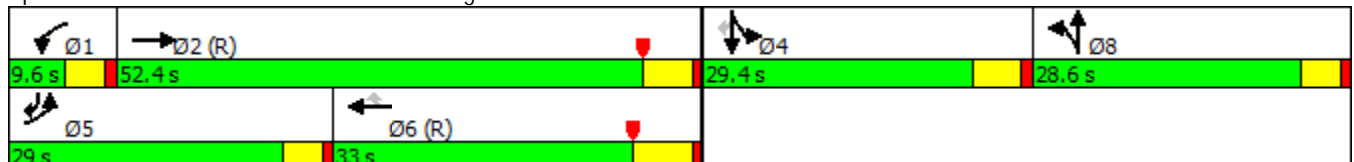


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	288	1032	10	691	136	20	9	184	2	481
Future Volume (vph)	288	1032	10	691	136	20	9	184	2	481
Turn Type	Prot	NA	Prot	NA	Perm	Split	NA	Split	NA	pm+ov
Protected Phases	5	2	1	6		8	8	4	4	5
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	8	8	4	4	5
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	28.4	9.6	29.2	29.2	28.6	28.6	29.4	29.4	9.6
Total Split (s)	29.0	52.4	9.6	33.0	33.0	28.6	28.6	29.4	29.4	29.0
Total Split (%)	24.2%	43.7%	8.0%	27.5%	27.5%	23.8%	23.8%	24.5%	24.5%	24.2%
Yellow Time (s)	3.6	4.4	3.6	5.2	5.2	3.6	3.6	4.4	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	6.2	6.2	4.6	4.6	5.4	5.4	4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	C-Max	None	C-Max	C-Max	Max	Max	Max	Max	None
Act Effct Green (s)	23.5	54.7	5.0	27.7	27.7	24.0	24.0	24.0	24.0	48.3
Actuated g/C Ratio	0.20	0.46	0.04	0.23	0.23	0.20	0.20	0.20	0.20	0.40
v/c Ratio	0.93	0.68	0.16	0.89	0.28	0.06	0.13	0.29	0.28	0.52
Control Delay	74.0	9.9	60.7	59.5	7.4	39.6	16.4	43.5	43.2	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.0	9.9	60.7	59.5	7.4	39.6	16.4	43.5	43.2	3.9
LOS	E	A	E	E	A	D	B	D	D	A
Approach Delay		23.8		51.0			23.5		14.9	
Approach LOS		C		D			C		B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 32 (27%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 29.6
 Intersection LOS: C
 Intersection Capacity Utilization 86.6%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 4: Arrowhead Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
4: Arrowhead Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	288	1032	4	10	691	136	20	9	37	184	2	481
Future Volume (vph)	288	1032	4	10	691	136	20	9	37	184	2	481
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	6.2	6.2	4.6	4.6		5.4	5.4	4.6
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		0.95	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	0.97		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.88		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00
Satd. Flow (prot)	1700	3600		1700	3600	1800	1700	1800		1700	1800	1800
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00
Satd. Flow (perm)	1700	3600		1700	3600	1800	1700	1800		1700	1800	1800
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	310	1110	4	11	743	146	22	10	40	198	2	517
RTOR Reduction (vph)	0	0	0	0	0	112	0	32	0	0	0	274
Lane Group Flow (vph)	310	1114	0	11	743	34	22	18	0	99	101	243
Confl. Peds. (#/hr)									15			23
Confl. Bikes (#/hr)												1
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		8	8		4	4	5
Permitted Phases						6						4
Actuated Green, G (s)	23.5	51.0		1.0	27.7	27.7	24.0	24.0		24.0	24.0	47.5
Effective Green, g (s)	23.5	51.0		1.0	27.7	27.7	24.0	24.0		24.0	24.0	47.5
Actuated g/C Ratio	0.20	0.42		0.01	0.23	0.23	0.20	0.20		0.20	0.20	0.40
Clearance Time (s)	4.6	5.4		4.6	6.2	6.2	4.6	4.6		5.4	5.4	4.6
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	3.0	3.0		3.0	3.0	2.0
Lane Grp Cap (vph)	332	1530		14	831	415	340	360		340	360	712
v/s Ratio Prot	c0.18	0.31		0.01	c0.21		c0.01	0.01		0.06	0.06	c0.07
v/s Ratio Perm						0.02						0.07
v/c Ratio	0.93	0.73		0.79	0.89	0.08	0.06	0.05		0.29	0.28	0.34
Uniform Delay, d1	47.5	28.7		59.4	44.7	36.2	38.9	38.8		40.8	40.7	25.3
Progression Factor	1.15	0.33		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	17.8	1.3		123.8	14.1	0.4	0.4	0.3		2.2	1.9	0.1
Delay (s)	72.5	10.9		183.2	58.8	36.6	39.3	39.1		42.9	42.6	25.4
Level of Service	E	B		F	E	D	D	D		D	D	C
Approach Delay (s)		24.3			56.7			39.1			30.3	
Approach LOS		C			E			D			C	

Intersection Summary

HCM 2000 Control Delay	35.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.8
Intersection Capacity Utilization	86.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	288	1032	4	10	691	136	20	9	37	184	2	481
Future Volume (veh/h)	288	1032	4	10	691	136	20	9	37	184	2	481
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	310	1110	4	11	743	94	22	10	25	199	0	448
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	327	1447	5	21	769	344	324	90	225	648	0	600
Arrive On Green	0.40	0.83	0.83	0.01	0.22	0.22	0.20	0.20	0.20	0.20	0.00	0.20
Sat Flow, veh/h	1619	3495	13	1619	3420	1530	1619	449	1123	3238	0	1458
Grp Volume(v), veh/h	310	543	571	11	743	94	22	0	35	199	0	448
Grp Sat Flow(s),veh/h/ln	1619	1710	1798	1619	1710	1530	1619	0	1572	1619	0	1458
Q Serve(g_s), s	22.2	18.0	18.0	0.8	25.8	6.1	1.3	0.0	2.2	6.3	0.0	24.0
Cycle Q Clear(g_c), s	22.2	18.0	18.0	0.8	25.8	6.1	1.3	0.0	2.2	6.3	0.0	24.0
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.71	1.00		1.00
Lane Grp Cap(c), veh/h	327	708	744	21	769	344	324	0	314	648	0	600
V/C Ratio(X)	0.95	0.77	0.77	0.53	0.97	0.27	0.07	0.00	0.11	0.31	0.00	0.75
Avail Cap(c_a), veh/h	329	708	744	67	769	344	324	0	314	648	0	600
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.22	0.22	0.22	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.2	7.6	7.6	58.9	46.1	38.4	38.9	0.0	39.3	40.9	0.0	31.0
Incr Delay (d2), s/veh	12.7	1.8	1.7	7.6	25.2	2.0	0.4	0.0	0.7	1.2	0.0	8.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.0	8.2	8.6	0.4	14.9	2.8	0.6	0.0	1.0	2.9	0.0	14.0
LnGrp Delay(d),s/veh	47.9	9.4	9.3	66.5	71.2	40.4	39.3	0.0	40.0	42.1	0.0	39.2
LnGrp LOS	D	A	A	E	E	D	D		D	D		D
Approach Vol, veh/h		1424			848			57			647	
Approach Delay, s/veh		17.8			67.8			39.7			40.1	
Approach LOS		B			E			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.1	55.9		29.4	28.8	33.2		28.6				
Change Period (Y+Rc), s	4.6	* 6.2		5.4	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.0	* 47		24.0	24.4	26.8		24.0				
Max Q Clear Time (g_c+I1), s	2.8	20.0		26.0	24.2	27.8		4.2				
Green Ext Time (p_c), s	0.0	18.9		0.0	0.0	0.0		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay				37.3								
HCM 2010 LOS				D								
Notes												

Timings

5: Washington Av./Washington Av. & Orange Show Rd.

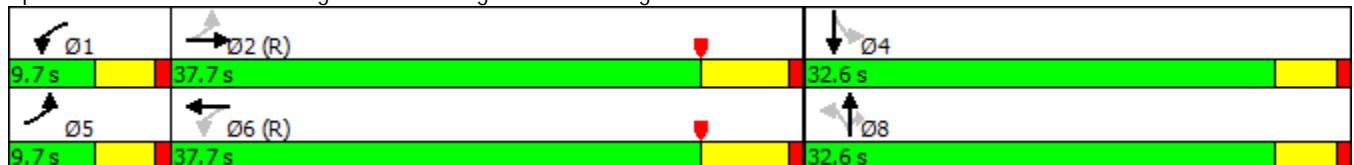


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↖	↗		↖	↗		↕
Traffic Volume (vph)	33	1232	4	765	47	2	5	1	1
Future Volume (vph)	33	1232	4	765	47	2	5	1	1
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	Perm	NA
Protected Phases	5	2	1	6		8			4
Permitted Phases	2		6		8		8	4	
Detector Phase	5	2	1	6	8	8	8	4	4
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	9.6	23.2	32.6	32.6	32.6	32.6	32.6
Total Split (s)	9.7	37.7	9.7	37.7	32.6	32.6	32.6	32.6	32.6
Total Split (%)	12.1%	47.1%	12.1%	47.1%	40.8%	40.8%	40.8%	40.8%	40.8%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6	4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None
Act Effect Green (s)	64.0	62.0	63.0	58.1		13.6	13.6		13.6
Actuated g/C Ratio	0.80	0.78	0.79	0.73		0.17	0.17		0.17
v/c Ratio	0.03	0.49	0.00	0.32		0.18	0.01		0.04
Control Delay	5.3	9.9	6.2	9.1		27.2	0.0		12.8
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Delay	5.3	9.9	6.2	9.1		27.2	0.0		12.8
LOS	A	A	A	A		C	A		B
Approach Delay		9.8		9.1		24.9			12.8
Approach LOS		A		A		C			B

Intersection Summary

Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.49
 Intersection Signal Delay: 9.9
 Intersection LOS: A
 Intersection Capacity Utilization 66.3%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 5: Washington Av./Washington Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
5: Washington Av./Washington Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	1232	25	4	765	8	47	2	5	1	1	11
Future Volume (vph)	33	1232	25	4	765	8	47	2	5	1	1	11
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2		4.6	6.2			4.6	4.6		4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85		0.88	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		1.00	
Satd. Flow (prot)	1700	3600		1700	3600			1800	1800		1800	
Flt Permitted	0.30	1.00		0.16	1.00			0.72	1.00		0.98	
Satd. Flow (perm)	1700	3600		1700	3600			1800	1800		1800	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	36	1354	27	4	841	9	52	2	5	1	1	12
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	4	0	11	0
Lane Group Flow (vph)	36	1380	0	4	849	0	0	54	1	0	3	0
Confl. Bikes (#/hr)			1									1
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)	57.0	54.0		53.0	52.0			9.6	9.6		9.6	
Effective Green, g (s)	57.0	54.0		53.0	52.0			9.6	9.6		9.6	
Actuated g/C Ratio	0.71	0.68		0.66	0.65			0.12	0.12		0.12	
Clearance Time (s)	4.6	6.2		4.6	6.2			4.6	4.6		4.6	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	1211	2430		1126	2340			216	216		216	
v/s Ratio Prot	c0.00	c0.38		0.00	0.24							
v/s Ratio Perm	0.02			0.00				0.03	0.00		0.00	
v/c Ratio	0.03	0.57		0.00	0.36			0.25	0.00		0.02	
Uniform Delay, d1	3.5	6.9		5.1	6.4			31.9	31.0		31.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.0	1.0		0.0	0.4			0.6	0.0		0.0	
Delay (s)	3.5	7.8		5.1	6.9			32.5	31.0		31.1	
Level of Service	A	A		A	A			C	C		C	
Approach Delay (s)		7.7			6.8			32.4			31.1	
Approach LOS		A			A			C			C	




















Intersection Summary

HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.4
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary
 5: Washington Av./Washington Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	1232	25	4	765	8	47	2	5	1	1	11
Future Volume (veh/h)	33	1232	25	4	765	8	47	2	5	1	1	11
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	36	1354	27	4	841	9	52	2	4	1	1	2
Adj No. of Lanes	1	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	505	2429	48	294	2356	25	218	7	143	73	58	75
Arrive On Green	0.03	0.71	0.71	0.01	0.68	0.68	0.09	0.09	0.09	0.09	0.09	0.09
Sat Flow, veh/h	1619	3428	68	1619	3466	37	1383	72	1530	183	617	799
Grp Volume(v), veh/h	36	675	706	4	415	435	54	0	4	4	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1786	1619	1710	1793	1454	0	1530	1599	0	0
Q Serve(g_s), s	0.5	15.2	15.2	0.1	8.2	8.2	2.6	0.0	0.2	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.5	15.2	15.2	0.1	8.2	8.2	2.8	0.0	0.2	0.2	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.02	0.96		1.00	0.25		0.50
Lane Grp Cap(c), veh/h	505	1212	1266	294	1162	1219	224	0	143	206	0	0
V/C Ratio(X)	0.07	0.56	0.56	0.01	0.36	0.36	0.24	0.00	0.03	0.02	0.00	0.00
Avail Cap(c_a), veh/h	552	1212	1266	388	1162	1219	595	0	535	604	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.30	0.30	0.30	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	3.8	5.6	5.6	5.0	5.4	5.4	34.1	0.0	33.0	33.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.9	1.8	0.0	0.3	0.2	0.5	0.0	0.1	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	7.7	8.1	0.0	3.9	4.1	1.2	0.0	0.1	0.1	0.0	0.0
LnGrp Delay(d),s/veh	3.8	7.5	7.4	5.0	5.7	5.7	34.7	0.0	33.0	33.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C		C	C		
Approach Vol, veh/h		1417			854			58				4
Approach Delay, s/veh		7.3			5.7			34.5				33.0
Approach LOS		A			A			C				C
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.0	62.9		12.1	7.4	60.6		12.1				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.1	31.5		28.0	5.1	31.5		28.0				
Max Q Clear Time (g_c+I1), s	2.1	17.2		2.2	2.5	10.2		4.8				
Green Ext Time (p_c), s	0.0	12.2		0.3	0.0	17.2		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			7.4									
HCM 2010 LOS			A									

Intersection

Int Delay, s/veh 4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	32	0	0	14	10	14
Future Vol, veh/h	32	0	0	14	10	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	35	0	0	15	11	15

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	33	18	26	0	-	0
Stage 1	18	-	-	-	-	-
Stage 2	15	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	986	1066	1601	-	-	-
Stage 1	1010	-	-	-	-	-
Stage 2	1013	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	986	1066	1601	-	-	-
Mov Cap-2 Maneuver	986	-	-	-	-	-
Stage 1	1010	-	-	-	-	-
Stage 2	1013	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1601	-	986	-	-
HCM Lane V/C Ratio	-	-	0.035	-	-
HCM Control Delay (s)	0	-	8.8	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection

Int Delay, s/veh 4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↔	
Traffic Vol, veh/h	0	0	0	0	0	17	0	0	0	15	0	0
Future Vol, veh/h	0	0	0	0	0	17	0	0	0	15	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	54	54	54	54	54	54	54	54	54	54	54	54
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	31	0	0	0	28	0	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	31	0	16
Stage 1	-	-	16
Stage 2	-	-	0
Critical Hdwy	4.1	-	6.4
Critical Hdwy Stg 1	-	-	5.4
Critical Hdwy Stg 2	-	-	5.4
Follow-up Hdwy	2.2	-	3.5
Pot Cap-1 Maneuver	1595	0	1008
Stage 1	-	0	1012
Stage 2	-	0	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1595	-	1008
Mov Cap-2 Maneuver	-	-	1008
Stage 1	-	-	1012
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1595	-	-	-	1008
HCM Lane V/C Ratio	-	-	-	-	0.028
HCM Control Delay (s)	0	-	-	-	8.7
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection

Int Delay, s/veh 7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	0	3	15	0	32	0	10	14	0
Future Vol, veh/h	0	0	0	0	3	15	0	32	0	10	14	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	69	69	69	69	69	69	69	69	69	69	69	69
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	4	22	0	46	0	14	20	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	26	0	0	1	0	0	26	27	1	40	16	15
Stage 1	-	-	-	-	-	-	1	1	-	15	15	-
Stage 2	-	-	-	-	-	-	25	26	-	25	1	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1601	-	-	1635	-	-	990	870	1090	969	882	1070
Stage 1	-	-	-	-	-	-	1027	899	-	1010	887	-
Stage 2	-	-	-	-	-	-	998	878	-	998	899	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1601	-	-	1635	-	-	973	870	1090	930	882	1070
Mov Cap-2 Maneuver	-	-	-	-	-	-	973	870	-	930	882	-
Stage 1	-	-	-	-	-	-	1027	899	-	1010	887	-
Stage 2	-	-	-	-	-	-	975	878	-	947	899	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	9.4	9.2
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	870	1601	-	-	1635	-	-	901
HCM Lane V/C Ratio	0.053	-	-	-	-	-	-	0.039
HCM Control Delay (s)	9.4	0	-	-	0	-	-	9.2
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.1

Timings

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.

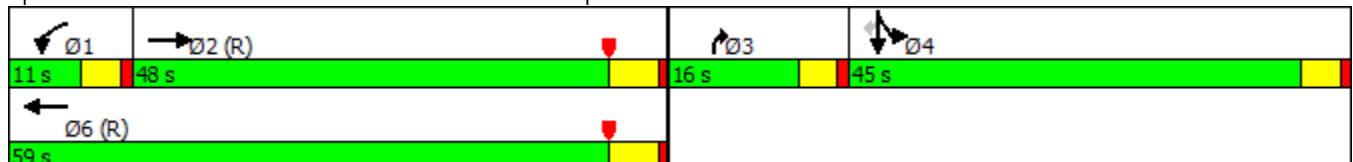


Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↖	↑↑	↗	↖	↕	↗
Traffic Volume (vph)	632	21	565	62	501	123	379
Future Volume (vph)	632	21	565	62	501	123	379
Turn Type	NA	Prot	NA	Prot	Split	NA	Perm
Protected Phases	2	1	6	3	4	4	
Permitted Phases							4
Detector Phase	2	1	6	3	4	4	4
Switch Phase							
Minimum Initial (s)	10.0	5.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	22.4	9.6	15.4	9.5	14.6	14.6	14.6
Total Split (s)	48.0	11.0	59.0	16.0	45.0	45.0	45.0
Total Split (%)	40.0%	9.2%	49.2%	13.3%	37.5%	37.5%	37.5%
Yellow Time (s)	4.4	3.6	4.4	3.5	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	4.6	5.4	4.5	4.6	4.6	4.6
Lead/Lag	Lag	Lead		Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes
Recall Mode	C-Max	None	C-Max	None	Max	Max	Max
Act Effect Green (s)	47.1	5.8	53.6	5.5	48.4	48.4	48.4
Actuated g/C Ratio	0.39	0.05	0.45	0.05	0.40	0.40	0.40
v/c Ratio	0.49	0.28	0.38	0.27	0.49	0.46	0.44
Control Delay	29.8	63.8	23.0	2.6	30.3	29.6	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	63.8	23.0	2.6	30.3	29.6	5.9
LOS	C	E	C	A	C	C	A
Approach Delay	29.8		24.5			20.9	
Approach LOS	C		C			C	

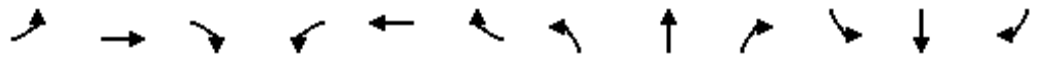
Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 11 (9%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.49
 Intersection Signal Delay: 23.8
 Intersection LOS: C
 Intersection Capacity Utilization 53.3%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.






















HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑↑				↑	↑	↑	↑
Traffic Volume (vph)	0	632	17	21	565	0	0	0	62	501	123	379
Future Volume (vph)	0	632	17	21	565	0	0	0	62	501	123	379
Ideal Flow (vphpl)	1800	1800	1800	1700	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Lane Util. Factor		0.95		1.00	0.95				1.00	0.95	0.95	1.00
Frbp, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00		1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00				1.00	0.95	0.97	1.00
Satd. Flow (prot)		3600		1700	3600				1800	1700	1800	1800
Flt Permitted		1.00		0.95	1.00				1.00	0.95	0.97	1.00
Satd. Flow (perm)		3600		1700	3600				1800	1700	1800	1800
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	680	18	23	608	0	0	0	67	539	132	408
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	65	0	0	212
Lane Group Flow (vph)	0	697	0	23	608	0	0	0	2	334	337	196
Confl. Peds. (#/hr)			3			1						
Turn Type		NA		Prot	NA				Prot	Split	NA	Perm
Protected Phases		2		1	6				3	4	4	
Permitted Phases												4
Actuated Green, G (s)		44.3		3.8	52.7				4.4	48.4	48.4	48.4
Effective Green, g (s)		44.3		3.8	52.7				4.4	48.4	48.4	48.4
Actuated g/C Ratio		0.37		0.03	0.44				0.04	0.40	0.40	0.40
Clearance Time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Vehicle Extension (s)		3.0		2.0	3.0				3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1329		53	1581				66	685	726	726
v/s Ratio Prot		c0.19		0.01	c0.17				c0.00	c0.20	0.19	
v/s Ratio Perm												0.11
v/c Ratio		0.52		0.43	0.38				0.04	0.49	0.46	0.27
Uniform Delay, d1		29.6		57.0	22.7				55.8	26.6	26.3	24.0
Progression Factor		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		1.5		2.1	0.7				0.2	2.5	2.1	0.9
Delay (s)		31.1		59.1	23.4				56.0	29.1	28.4	24.9
Level of Service		C		E	C				E	C	C	C
Approach Delay (s)		31.1			24.7			56.0			27.3	
Approach LOS		C			C			E			C	

Intersection Summary			
HCM 2000 Control Delay	28.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.1
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	632	17	21	565	0	0	0	62	501	123	379
Future Volume (veh/h)	0	632	17	21	565	0	0	0	62	501	123	379
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	0	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	680	12	23	608	0	0	0	39	336	417	406
Adj No. of Lanes	0	2	0	1	2	0	0	0	1	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1786	32	36	1984	0	0	0	0	545	606	515
Arrive On Green	0.00	0.52	0.52	0.02	0.58	0.00	0.00	0.00	0.00	0.34	0.34	0.34
Sat Flow, veh/h	0	3528	61	1619	3510	0		0		1619	1800	1530
Grp Volume(v), veh/h	0	338	354	23	608	0		0.0		336	417	406
Grp Sat Flow(s),veh/h/ln	0	1710	1789	1619	1710	0				1619	1800	1530
Q Serve(g_s), s	0.0	14.2	14.2	1.7	10.9	0.0				20.8	24.0	28.8
Cycle Q Clear(g_c), s	0.0	14.2	14.2	1.7	10.9	0.0				20.8	24.0	28.8
Prop In Lane	0.00		0.03	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	888	929	36	1984	0				545	606	515
V/C Ratio(X)	0.00	0.38	0.38	0.64	0.31	0.00				0.62	0.69	0.79
Avail Cap(c_a), veh/h	0	888	929	86	1984	0				545	606	515
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.57	0.57	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	17.3	17.3	58.2	12.9	0.0				33.3	34.4	35.9
Incr Delay (d2), s/veh	0.0	1.2	1.2	3.9	0.2	0.0				5.2	6.3	11.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.0	7.3	0.8	5.2	0.0				10.1	13.0	13.7
LnGrp Delay(d),s/veh	0.0	18.5	18.5	62.1	13.1	0.0				38.5	40.6	47.5
LnGrp LOS		B	B	E	B					D	D	D
Approach Vol, veh/h		692			631						1159	
Approach Delay, s/veh		18.5			14.9						42.4	
Approach LOS		B			B						D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	7.3	67.7		45.0		75.0						
Change Period (Y+Rc), s	4.6	5.4		4.6		5.4						
Max Green Setting (Gmax), s	6.4	42.6		40.4		53.6						
Max Q Clear Time (g_c+I1), s	3.7	16.2		30.8		12.9						
Green Ext Time (p_c), s	0.0	8.9		3.5		10.0						
Intersection Summary												
HCM 2010 Ctrl Delay				28.7								
HCM 2010 LOS				C								
Notes												

Timings

9: Waterman Av. & Orange Show Rd./Orange Show Rd.

3/27/2017

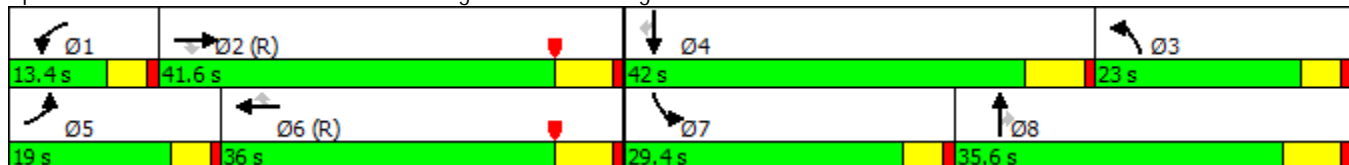


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗↗	↘	↘	↗	↘	↘	↗↗	↘	↘	↗↗	↘
Traffic Volume (vph)	168	855	232	79	445	84	243	723	139	139	753	118
Future Volume (vph)	168	855	232	79	445	84	243	723	139	139	753	118
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.2	35.2	9.6	35.2	35.2	9.6	33.2	33.2	9.6	33.2	33.2
Total Split (s)	19.0	41.6	41.6	13.4	36.0	36.0	23.0	35.6	35.6	29.4	42.0	42.0
Total Split (%)	15.8%	34.7%	34.7%	11.2%	30.0%	30.0%	19.2%	29.7%	29.7%	24.5%	35.0%	35.0%
Yellow Time (s)	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Act Effect Green (s)	13.9	35.9	35.9	8.3	30.3	30.3	18.4	39.5	39.5	14.7	35.8	35.8
Actuated g/C Ratio	0.12	0.30	0.30	0.07	0.25	0.25	0.15	0.33	0.33	0.12	0.30	0.30
v/c Ratio	0.90	0.83	0.35	0.71	1.03	0.14	0.98	0.64	0.21	0.71	0.74	0.19
Control Delay	94.4	47.5	5.6	85.8	94.9	0.5	103.1	38.1	5.1	68.0	42.8	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.4	47.5	5.6	85.8	94.9	0.5	103.1	38.1	5.1	68.0	42.8	2.2
LOS	F	D	A	F	F	A	F	D	A	E	D	A
Approach Delay		46.1			80.8			48.3			41.5	
Approach LOS		D			F			D			D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.03
 Intersection Signal Delay: 50.8
 Intersection LOS: D
 Intersection Capacity Utilization 90.1%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↘	↘	↑	↘	↘	↑↑	↘	↘	↑↑	↘
Traffic Volume (vph)	168	855	232	79	445	84	243	723	139	139	753	118
Future Volume (vph)	168	855	232	79	445	84	243	723	139	139	753	118
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	177	900	244	83	468	88	256	761	146	146	793	124
RTOR Reduction (vph)	0	0	169	0	0	66	0	0	98	0	0	87
Lane Group Flow (vph)	177	900	75	83	468	22	256	761	48	146	793	37
Confl. Peds. (#/hr)			1						1			
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	13.9	35.9	35.9	8.3	30.3	30.3	18.4	39.5	39.5	14.7	35.8	35.8
Effective Green, g (s)	13.9	35.9	35.9	8.3	30.3	30.3	18.4	39.5	39.5	14.7	35.8	35.8
Actuated g/C Ratio	0.12	0.30	0.30	0.07	0.25	0.25	0.15	0.33	0.33	0.12	0.30	0.30
Clearance Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	196	1077	538	117	454	454	260	1185	592	208	1074	537
v/s Ratio Prot	c0.10	0.25		0.05	c0.26		c0.15	0.21		0.09	c0.22	
v/s Ratio Perm			0.04			0.01			0.03			0.02
v/c Ratio	0.90	0.84	0.14	0.71	1.03	0.05	0.98	0.64	0.08	0.70	0.74	0.07
Uniform Delay, d1	52.4	39.3	30.8	54.7	44.9	33.9	50.7	34.2	27.7	50.5	37.9	30.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	37.7	7.7	0.5	14.8	50.4	0.2	51.0	2.7	0.3	8.4	4.6	0.2
Delay (s)	90.0	47.0	31.3	69.5	95.2	34.1	101.7	36.9	28.0	59.0	42.4	30.4
Level of Service	F	D	C	E	F	C	F	D	C	E	D	C
Approach Delay (s)		49.9			83.5			50.1			43.3	
Approach LOS		D			F			D			D	

























Intersection Summary		
HCM 2000 Control Delay	53.4	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.90	D
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	90.1%	21.6
Analysis Period (min)	15	ICU Level of Service
		E

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	168	855	232	79	445	84	243	723	139	139	753	118
Future Volume (veh/h)	168	855	232	79	445	84	243	723	139	139	753	118
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	177	900	191	83	468	53	256	761	95	146	793	86
Adj No. of Lanes	1	2	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	194	2549	1126	102	1239	1053	248	1229	549	171	1020	456
Arrive On Green	0.12	0.75	0.75	0.06	0.69	0.69	0.15	0.36	0.36	0.11	0.30	0.30
Sat Flow, veh/h	1619	3420	1511	1619	1800	1530	1619	3420	1529	1619	3420	1530
Grp Volume(v), veh/h	177	900	191	83	468	53	256	761	95	146	793	86
Grp Sat Flow(s),veh/h/ln	1619	1710	1511	1619	1800	1530	1619	1710	1529	1619	1710	1530
Q Serve(g_s), s	13.0	10.9	7.8	6.1	13.1	1.3	18.4	22.0	5.1	10.6	25.4	6.8
Cycle Q Clear(g_c), s	13.0	10.9	7.8	6.1	13.1	1.3	18.4	22.0	5.1	10.6	25.4	6.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	194	2549	1126	102	1239	1053	248	1229	549	171	1020	456
V/C Ratio(X)	0.91	0.35	0.17	0.81	0.38	0.05	1.03	0.62	0.17	0.85	0.78	0.19
Avail Cap(c_a), veh/h	194	2549	1126	119	1239	1053	248	1229	549	335	1020	456
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.89	0.89	0.89	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.2	5.3	14.0	55.5	7.9	6.0	50.8	31.7	26.3	52.8	38.5	56.8
Incr Delay (d2), s/veh	36.9	0.3	0.3	26.0	0.9	0.1	65.4	2.3	0.7	4.6	5.8	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.8	5.2	3.3	3.5	6.8	0.6	12.7	10.8	2.3	5.0	12.8	3.0
LnGrp Delay(d),s/veh	89.0	5.6	14.3	81.5	8.8	6.1	116.3	34.0	26.9	57.4	44.3	57.7
LnGrp LOS	F	A	B	F	A	A	F	C	C	E	D	E
Approach Vol, veh/h		1268			604			1112			1025	
Approach Delay, s/veh		18.6			18.5			52.3			47.3	
Approach LOS		B			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.2	97.2	24.6	42.0	19.0	90.4	17.3	49.3				
Change Period (Y+Rc), s	4.6	6.2	6.2	* 6.2	4.6	6.2	4.6	6.2				
Max Green Setting (Gmax), s	8.8	35.4	18.4	* 36	14.4	29.8	24.8	29.4				
Max Q Clear Time (g_c+I1), s	8.1	12.9	20.4	27.4	15.0	15.1	12.6	24.0				
Green Ext Time (p_c), s	0.0	13.4	0.0	3.2	0.0	10.0	0.1	2.5				
Intersection Summary												
HCM 2010 Ctrl Delay			35.3									
HCM 2010 LOS			D									
Notes												

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↕	
Traffic Vol, veh/h	2	11	9	1102	1032	4
Future Vol, veh/h	2	11	9	1102	1032	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	75	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	2	12	10	1198	1122	4

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1742	563	1126 0
Stage 1	1124	-	- -
Stage 2	618	-	- -
Critical Hdwy	6.8	6.9	4.1 -
Critical Hdwy Stg 1	5.8	-	- -
Critical Hdwy Stg 2	5.8	-	- -
Follow-up Hdwy	3.5	3.3	2.2 -
Pot Cap-1 Maneuver	*79	*671	*1008 -
Stage 1	*633	-	- -
Stage 2	*614	-	- -
Platoon blocked, %		1	1 -
Mov Cap-1 Maneuver	*78	*671	*1008 -
Mov Cap-2 Maneuver	*319	-	- -
Stage 1	*633	-	- -
Stage 2	*608	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	11.4	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	* 1008	-	319	671	-	-
HCM Lane V/C Ratio	0.01	-	0.007	0.018	-	-
HCM Control Delay (s)	8.6	-	16.4	10.5	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0	0.1	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Timings
11: Waterman Av. & Driveway 2/Park Center Dr.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↕		↕	↕	↕	↕↕	↕	↕	↕↕
Traffic Volume (vph)	53	0	100	0	32	36	1094	16	8	1199
Future Volume (vph)	53	0	100	0	32	36	1094	16	8	1199
Turn Type	Perm	NA	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4		8		5	2		1	6
Permitted Phases	4		8		8	2		2	6	
Detector Phase	4	4	8	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	21.6	21.6	21.6	9.6	23.2	23.2	9.6	33.2
Total Split (s)	21.6	21.6	21.6	21.6	21.6	9.6	33.8	33.8	9.6	33.8
Total Split (%)	33.2%	33.2%	33.2%	33.2%	33.2%	14.8%	52.0%	52.0%	14.8%	52.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		4.6	4.6	4.6	6.2	6.2	4.6	6.2
Lead/Lag						Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)		11.5		11.5	11.5	46.3	44.9	44.9	47.1	42.9
Actuated g/C Ratio		0.18		0.18	0.18	0.71	0.69	0.69	0.72	0.66
v/c Ratio		0.43		0.35	0.08	0.15	0.49	0.01	0.01	0.57
Control Delay		10.1		25.9	0.4	5.5	8.7	0.0	4.4	11.6
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		10.1		25.9	0.4	5.5	8.7	0.0	4.4	11.6
LOS		B		C	A	A	A	A	A	B
Approach Delay		10.1		19.6			8.5			11.5
Approach LOS		B		B			A			B

Intersection Summary

Cycle Length: 65
 Actuated Cycle Length: 65
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.57
 Intersection Signal Delay: 10.5
 Intersection LOS: B
 Intersection Capacity Utilization 61.6%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 11: Waterman Av. & Driveway 2/Park Center Dr.



HCM Signalized Intersection Capacity Analysis
 11: Waterman Av. & Driveway 2/Park Center Dr.

Gateway South Building 4 TIA (JN 10187)

3/27/2017
























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↕	↕	↕	↕↕	
Traffic Volume (vph)	53	0	81	100	0	32	36	1094	16	8	1199	22
Future Volume (vph)	53	0	81	100	0	32	36	1094	16	8	1199	22
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)		4.6			4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes		1.00			1.00	0.99	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.92			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1621			1800	1800	1615	3600	1800	1700	3600	
Flt Permitted		0.82			0.63	1.00	0.14	1.00	1.00	0.19	1.00	
Satd. Flow (perm)		1359			1800	1800	231	3600	1800	1700	3600	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	59	0	90	111	0	36	40	1216	18	9	1332	24
RTOR Reduction (vph)	0	112	0	0	0	31	0	0	7	0	1	0
Lane Group Flow (vph)	0	37	0	0	111	5	40	1216	11	9	1355	0
Confl. Peds. (#/hr)						1			1			1
Confl. Bikes (#/hr)									1			1
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1		6
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		9.5			9.5	9.5	41.2	39.1	39.1	39.0		38.0
Effective Green, g (s)		9.5			9.5	9.5	41.2	39.1	39.1	39.0		38.0
Actuated g/C Ratio		0.15			0.15	0.15	0.63	0.60	0.60	0.60		0.58
Clearance Time (s)		4.6			4.6	4.6	4.6	6.2	6.2	4.6		6.2
Vehicle Extension (s)		3.0			3.0	3.0	2.0	4.0	4.0	2.0		4.0
Lane Grp Cap (vph)		198			263	263	191	2165	1082	1020		2104
v/s Ratio Prot							c0.01	0.34		0.00		c0.38
v/s Ratio Perm		0.03			0.06	0.00	0.13		0.01	0.01		
v/c Ratio		0.19			0.42	0.02	0.21	0.56	0.01	0.01		0.64
Uniform Delay, d1		24.4			25.3	23.8	5.9	7.8	5.2	5.6		9.0
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2		0.5			1.1	0.0	0.2	1.1	0.0	0.0		1.5
Delay (s)		24.8			26.3	23.8	6.1	8.9	5.2	5.6		10.5
Level of Service		C			C	C	A	A	A	A		B
Approach Delay (s)		24.8			25.7			8.7				10.5
Approach LOS		C			C			A				B

Intersection Summary

HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	15.4
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	0	81	100	0	32	36	1094	16	8	1199	22
Future Volume (veh/h)	53	0	81	100	0	32	36	1094	16	8	1199	22
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	59	0	78	111	0	23	40	1216	18	9	1332	24
Adj No. of Lanes	0	1	0	0	1	1	1	2	1	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	134	28	109	312	0	286	268	1930	845	270	1842	33
Arrive On Green	0.19	0.00	0.19	0.19	0.00	0.19	0.04	0.56	0.56	0.01	0.54	0.54
Sat Flow, veh/h	291	148	580	1073	0	1528	1619	3420	1497	1619	3436	62
Grp Volume(v), veh/h	137	0	0	111	0	23	40	1216	18	9	663	693
Grp Sat Flow(s),veh/h/ln	1019	0	0	1073	0	1528	1619	1710	1497	1619	1710	1787
Q Serve(g_s), s	3.0	0.0	0.0	0.0	0.0	0.8	0.7	15.6	0.3	0.2	19.1	19.1
Cycle Q Clear(g_c), s	9.6	0.0	0.0	6.6	0.0	0.8	0.7	15.6	0.3	0.2	19.1	19.1
Prop In Lane	0.43		0.57	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	270	0	0	312	0	286	268	1930	845	270	917	958
V/C Ratio(X)	0.51	0.00	0.00	0.36	0.00	0.08	0.15	0.63	0.02	0.03	0.72	0.72
Avail Cap(c_a), veh/h	380	0	0	411	0	400	329	1930	845	376	917	958
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.3	0.0	0.0	24.1	0.0	21.8	9.1	9.6	6.2	8.2	11.4	11.4
Incr Delay (d2), s/veh	1.5	0.0	0.0	0.7	0.0	0.1	0.1	1.6	0.0	0.0	4.9	4.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	0.0	1.9	0.0	0.3	0.3	7.7	0.2	0.1	10.1	10.5
LnGrp Delay(d),s/veh	26.8	0.0	0.0	24.8	0.0	21.9	9.2	11.2	6.3	8.2	16.3	16.2
LnGrp LOS	C			C		C	A	B	A	A	B	B
Approach Vol, veh/h		137			134			1274			1365	
Approach Delay, s/veh		26.8			24.3			11.0			16.2	
Approach LOS		C			C			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.3	42.9		16.8	7.2	41.1		16.8				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.0	27.6		17.0	5.0	27.6		17.0				
Max Q Clear Time (g_c+I1), s	2.2	17.6		11.6	2.7	21.1		8.6				
Green Ext Time (p_c), s	0.0	9.3		0.7	0.0	6.2		1.0				
Intersection Summary												
HCM 2010 Ctrl Delay			14.8									
HCM 2010 LOS			B									

Timings

12: Waterman Av./Waterman Av. & Hospitality Ln.

3/27/2017

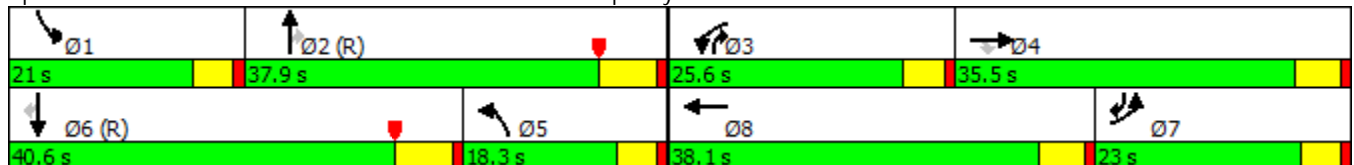


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↕	↘	↙↘	↕	↙↘	↕	↙↘	↙	↕↕	↘
Traffic Volume (vph)	168	383	554	390	450	265	464	687	200	976	166
Future Volume (vph)	168	383	554	390	450	265	464	687	200	976	166
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8	5	2	3	1	6	7
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	3	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	15.1	15.1	9.6	38.1	9.6	36.2	9.6	9.6	36.2	9.6
Total Split (s)	23.0	35.5	35.5	25.6	38.1	18.3	37.9	25.6	21.0	40.6	23.0
Total Split (%)	19.2%	29.6%	29.6%	21.3%	31.8%	15.3%	31.6%	21.3%	17.5%	33.8%	19.2%
Yellow Time (s)	3.6	4.1	4.1	3.6	4.1	3.6	5.2	3.6	3.6	5.2	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	5.1	4.6	5.1	4.6	6.2	4.6	4.6	6.2	4.6
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effect Green (s)	20.1	26.8	26.8	18.9	25.7	13.7	36.4	61.6	17.3	40.0	66.3
Actuated g/C Ratio	0.17	0.22	0.22	0.16	0.21	0.11	0.30	0.51	0.14	0.33	0.55
v/c Ratio	0.63	0.77	0.54	0.82	0.76	0.77	0.45	0.37	0.87	0.58	0.17
Control Delay	57.0	42.2	14.7	64.7	51.2	66.7	36.7	12.5	82.8	35.6	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.0	42.2	14.7	64.7	51.2	66.7	36.7	12.5	82.8	35.6	5.9
LOS	E	D	B	E	D	E	D	B	F	D	A
Approach Delay		37.1			56.7		30.6			39.0	
Approach LOS		D			E		C			D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 22 (18%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 105
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.87
 Intersection Signal Delay: 39.6
 Intersection LOS: D
 Intersection Capacity Utilization 85.1%
 ICU Level of Service E
 Analysis Period (min) 15

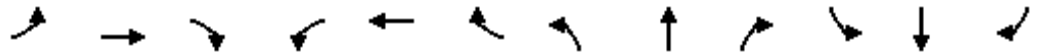
Splits and Phases: 12: Waterman Av./Waterman Av. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
 12: Waterman Av./Waterman Av. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)
























3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	168	383	554	390	450	118	265	464	687	200	976	166
Future Volume (vph)	168	383	554	390	450	118	265	464	687	200	976	166
Ideal Flow (vphp)	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Lane Util. Factor	1.00	0.91	0.91	0.97	0.95		0.97	0.95	0.88	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.94	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Flt Permitted	1.00	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	179	407	589	415	479	126	282	494	731	213	1038	177
RTOR Reduction (vph)	0	87	177	0	21	0	0	0	127	0	0	58
Lane Group Flow (vph)	179	597	135	415	584	0	282	494	604	213	1038	119
Confl. Peds. (#/hr)						7			5			13
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4						2			6
Actuated Green, G (s)	20.1	26.9	26.9	18.9	25.7		13.7	36.4	55.3	17.3	40.0	60.1
Effective Green, g (s)	20.1	26.9	26.9	18.9	25.7		13.7	36.4	55.3	17.3	40.0	60.1
Actuated g/C Ratio	0.17	0.22	0.22	0.16	0.21		0.11	0.30	0.46	0.14	0.33	0.50
Clearance Time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	4.0	2.0	2.0	4.0	2.0
Lane Grp Cap (vph)	284	807	403	504	771		365	1092	1659	245	1800	970
v/s Ratio Prot	0.11	c0.17		0.13	c0.16		c0.09	0.14	0.06	c0.13	c0.19	0.02
v/s Ratio Perm			0.08						0.11			0.05
v/c Ratio	0.63	0.74	0.34	0.82	0.76		0.77	0.45	0.36	0.87	0.58	0.12
Uniform Delay, d1	46.5	43.3	39.0	48.9	44.2		51.6	33.8	21.0	50.2	33.0	15.9
Progression Factor	1.00	1.00	1.00	1.05	1.07		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.3	3.6	0.5	9.5	4.1		8.9	1.4	0.0	25.5	1.4	0.0
Delay (s)	49.8	46.9	39.5	61.0	51.4		60.6	35.1	21.0	75.8	34.4	15.9
Level of Service	D	D	D	E	D		E	D	C	E	C	B
Approach Delay (s)		45.4			55.3			33.0			38.3	
Approach LOS		D			E			C			D	

Intersection Summary

HCM 2000 Control Delay	41.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	85.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	168	383	554	390	450	118	265	464	687	200	976	166
Future Volume (veh/h)	168	383	554	390	450	118	265	464	687	200	976	166
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	179	373	481	415	479	111	282	494	365	213	1038	107
Adj No. of Lanes	1	1	2	2	2	0	2	2	2	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	275	415	706	463	588	135	420	1044	1237	221	1409	692
Arrive On Green	0.17	0.23	0.23	0.16	0.21	0.21	0.14	0.31	0.31	0.14	0.29	0.29
Sat Flow, veh/h	1619	1800	3060	2956	2756	635	2956	3420	2671	1619	4914	1509
Grp Volume(v), veh/h	179	373	481	415	296	294	282	494	365	213	1038	107
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	1710	1681	1478	1710	1335	1619	1638	1509
Q Serve(g_s), s	12.4	24.1	11.9	16.5	19.8	20.0	10.9	14.1	10.2	15.7	22.9	0.0
Cycle Q Clear(g_c), s	12.4	24.1	11.9	16.5	19.8	20.0	10.9	14.1	10.2	15.7	22.9	0.0
Prop In Lane	1.00		1.00	1.00		0.38	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	275	415	706	463	365	358	420	1044	1237	221	1409	692
V/C Ratio(X)	0.65	0.90	0.68	0.90	0.81	0.82	0.67	0.47	0.30	0.96	0.74	0.15
Avail Cap(c_a), veh/h	275	456	775	517	470	462	420	1044	1237	221	1409	692
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.87	0.87	0.87	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.5	44.8	20.2	49.7	44.9	45.0	48.8	33.8	20.1	51.5	38.7	19.1
Incr Delay (d2), s/veh	4.3	19.2	2.2	14.3	7.2	7.8	3.4	1.5	0.6	49.5	3.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.8	14.2	5.2	7.7	10.1	10.1	4.6	6.9	3.9	10.1	10.8	2.1
LnGrp Delay(d),s/veh	50.8	64.0	22.4	64.0	52.1	52.8	52.2	35.4	20.7	101.0	42.2	19.5
LnGrp LOS	D	E	C	E	D	D	D	D	C	F	D	B
Approach Vol, veh/h		1033			1005			1141			1358	
Approach Delay, s/veh		42.4			57.2			34.9			49.6	
Approach LOS		D			E			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	21.0	42.8	23.4	32.8	23.2	40.6	25.5	30.7				
Change Period (Y+Rc), s	4.6	6.2	4.6	5.1	6.2	* 6.2	5.1	* 5.1				
Max Green Setting (Gmax), s	16.4	31.7	21.0	30.4	13.7	* 34	18.4	* 33				
Max Q Clear Time (g_c+I1), s	17.7	16.1	18.5	26.1	12.9	24.9	14.4	22.0				
Green Ext Time (p_c), s	0.0	5.9	0.2	1.6	0.1	5.7	1.8	2.6				
Intersection Summary												
HCM 2010 Ctrl Delay			45.9									
HCM 2010 LOS			D									
Notes												

Intersection

Int Delay, s/veh 1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↖ ↗	↖ ↗	↖ ↗	
Traffic Vol, veh/h	0	0	347	1439	1342	701
Future Vol, veh/h	0	0	347	1439	1342	701
Conflicting Peds, #/hr	0	0	0	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	0	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	377	1564	1459	762

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	732	1462 0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	7.1	5.3 -
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.9	3.1 -
Pot Cap-1 Maneuver	0	*615	*774 -
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	1	1 -
Mov Cap-1 Maneuver	-	*614	*774 -
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	2.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	* 774	-	-	-	-
HCM Lane V/C Ratio	0.487	-	-	-	-
HCM Control Delay (s)	14	-	0	-	-
HCM Lane LOS	B	-	A	-	-
HCM 95th %tile Q(veh)	2.7	-	-	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection

Int Delay, s/veh 0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations						↗		↑↑			↑↑	
Traffic Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Future Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	-	-	-	Free	-	-	-	-	-	None
Storage Length	-	-	-	-	-	0	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	1197	0	988	0	0	739	169

Major/Minor

	Minor1	Major1	Major2
Conflicting Flow All	-	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	0	0	0
Stage 1	0	0	0
Stage 2	0	0	0
Platoon blocked, %			
Mov Cap-1 Maneuver	-	0	-
Mov Cap-2 Maneuver	-	0	-
Stage 1	-	0	-
Stage 2	-	0	-

Approach

	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt

	NBTWBLn1	SBT	SBR
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	-	0	-
HCM Lane LOS	-	A	-
HCM 95th %tile Q(veh)	-	-	-

Intersection

Int Delay, s/veh

Movement	NWL	NWR
Lane Configurations		
Traffic Vol, veh/h	0	0
Future Vol, veh/h	0	0
Conflicting Peds, #/hr	0	0
Sign Control	Stop	Stop
RT Channelized	-	-
Storage Length	-	-
Veh in Median Storage, #	0	-
Grade, %	0	-
Peak Hour Factor	96	96
Heavy Vehicles, %	0	0
Mvmt Flow	0	0

Major/Minor

Conflicting Flow All
Stage 1
Stage 2
Critical Hdwy
Critical Hdwy Stg 1
Critical Hdwy Stg 2
Follow-up Hdwy
Pot Cap-1 Maneuver
Stage 1
Stage 2
Platoon blocked, %
Mov Cap-1 Maneuver
Mov Cap-2 Maneuver
Stage 1
Stage 2

Approach

HCM Control Delay, s
HCM LOS

Minor Lane/Major Mvmt

Timings

15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.

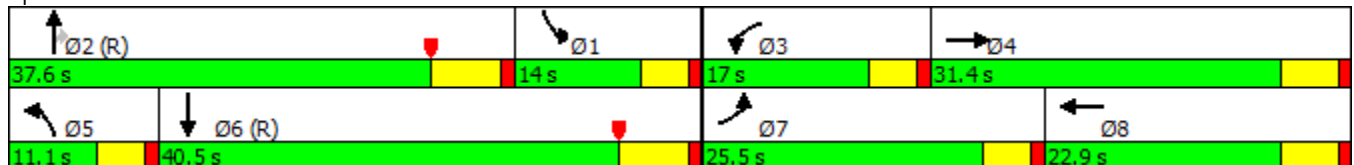


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖↗	↕	↖	↕	↖	↕	↗	↖	↕
Traffic Volume (vph)	483	654	169	353	51	884	83	201	519
Future Volume (vph)	483	654	169	353	51	884	83	201	519
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	9.6	31.4	9.6	15.4	9.6	36.2	36.2	9.6	36.2
Total Split (s)	25.5	31.4	17.0	22.9	11.1	37.6	37.6	14.0	40.5
Total Split (%)	25.5%	31.4%	17.0%	22.9%	11.1%	37.6%	37.6%	14.0%	40.5%
Yellow Time (s)	3.6	4.4	3.6	4.4	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	5.4	4.6	6.2	6.2	4.6	6.2
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)	19.1	25.5	12.0	18.4	6.2	32.2	32.2	9.4	37.4
Actuated g/C Ratio	0.19	0.26	0.12	0.18	0.06	0.32	0.32	0.09	0.37
v/c Ratio	0.84	0.91	0.88	0.78	0.52	0.81	0.12	1.35	0.54
Control Delay	52.1	49.3	83.0	42.2	63.1	38.0	0.4	228.4	25.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.1	49.3	83.0	42.2	63.1	38.0	0.4	228.4	25.4
LOS	D	D	F	D	E	D	A	F	C
Approach Delay		50.4		52.0		36.2			70.3
Approach LOS		D		D		D			E

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.35
 Intersection Signal Delay: 51.6
 Intersection LOS: D
 Intersection Capacity Utilization 90.0%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.



HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔	↕↔		↔	↕↕	↔	↔	↕↔	
Traffic Volume (vph)	483	654	143	169	353	181	51	884	83	201	519	188
Future Volume (vph)	483	654	143	169	353	181	51	884	83	201	519	188
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.95		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	514	696	152	180	376	193	54	940	88	214	552	200
RTOR Reduction (vph)	0	19	0	0	64	0	0	0	60	0	36	0
Lane Group Flow (vph)	514	829	0	180	505	0	54	940	28	214	716	0
Confl. Peds. (#/hr)			3						1			6
Confl. Bikes (#/hr)			1						1			
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	19.1	25.5		12.0	18.4		5.2	31.3	31.3	10.4	36.5	
Effective Green, g (s)	19.1	25.5		12.0	18.4		5.2	31.3	31.3	10.4	36.5	
Actuated g/C Ratio	0.19	0.26		0.12	0.18		0.05	0.31	0.31	0.10	0.36	
Clearance Time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	611	918		204	662		88	1126	563	176	1314	
v/s Ratio Prot	c0.16	c0.23		0.11	0.14		0.03	c0.26		c0.13	0.20	
v/s Ratio Perm									0.02			
v/c Ratio	0.84	0.90		0.88	0.76		0.61	0.83	0.05	1.22	0.55	
Uniform Delay, d1	39.0	36.1		43.3	38.7		46.4	31.9	24.0	44.8	25.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	9.8	12.1		32.2	5.2		8.6	7.4	0.2	137.8	1.6	
Delay (s)	48.8	48.1		75.5	43.9		55.0	39.3	24.1	182.6	26.8	
Level of Service	D	D		E	D		E	D	C	F	C	
Approach Delay (s)		48.4			51.5			38.8			61.3	
Approach LOS		D			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	49.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.8
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	483	654	143	169	353	181	51	884	83	201	519	188
Future Volume (veh/h)	483	654	143	169	353	181	51	884	83	201	519	188
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	514	696	145	180	376	152	54	940	57	214	552	139
Adj No. of Lanes	2	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	569	731	152	201	457	182	67	1074	474	951	2373	595
Arrive On Green	0.19	0.26	0.26	0.12	0.19	0.19	0.04	0.31	0.31	0.59	0.88	0.88
Sat Flow, veh/h	2956	2810	585	1619	2389	952	1619	3420	1509	1619	2709	680
Grp Volume(v), veh/h	514	423	418	180	268	260	54	940	57	214	348	343
Grp Sat Flow(s),veh/h/ln	1478	1710	1685	1619	1710	1632	1619	1710	1509	1619	1710	1678
Q Serve(g_s), s	17.0	24.3	24.4	11.0	15.0	15.4	3.3	26.0	3.8	6.3	3.2	3.2
Cycle Q Clear(g_c), s	17.0	24.3	24.4	11.0	15.0	15.4	3.3	26.0	3.8	6.3	3.2	3.2
Prop In Lane	1.00		0.35	1.00		0.58	1.00		1.00	1.00		0.40
Lane Grp Cap(c), veh/h	569	445	438	201	327	312	67	1074	474	951	1498	1471
V/C Ratio(X)	0.90	0.95	0.95	0.90	0.82	0.83	0.81	0.88	0.12	0.23	0.23	0.23
Avail Cap(c_a), veh/h	618	445	438	201	327	312	105	1074	474	951	1498	1471
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.87	0.87	0.87	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.5	36.4	36.4	43.2	38.8	38.9	47.5	32.4	48.2	9.8	1.0	1.0
Incr Delay (d2), s/veh	13.6	28.2	28.7	35.6	14.9	17.3	10.6	10.0	0.5	0.0	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.0	15.0	14.9	6.9	8.4	8.4	1.7	13.8	1.6	2.8	1.6	1.6
LnGrp Delay(d),s/veh	53.0	64.6	65.1	78.8	53.6	56.2	58.1	42.4	48.8	9.9	1.3	1.3
LnGrp LOS	D	E	E	E	D	E	E	D	D	A	A	A
Approach Vol, veh/h		1355			708			1051			905	
Approach Delay, s/veh		60.3			61.0			43.6			3.3	
Approach LOS		E			E			D			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	65.5	37.6	17.0	31.4	8.7	94.4	23.9	24.5				
Change Period (Y+Rc), s	6.2	* 6.2	4.6	5.4	4.6	6.2	4.6	5.4				
Max Green Setting (Gmax), s	9.4	* 31	12.4	26.0	6.5	34.3	20.9	17.5				
Max Q Clear Time (g_c+I1), s	8.3	28.0	13.0	26.4	5.3	5.2	19.0	17.4				
Green Ext Time (p_c), s	0.1	2.2	0.0	0.0	0.0	6.0	0.3	0.1				
Intersection Summary												
HCM 2010 Ctrl Delay			43.2									
HCM 2010 LOS			D									
Notes												

Timings
16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

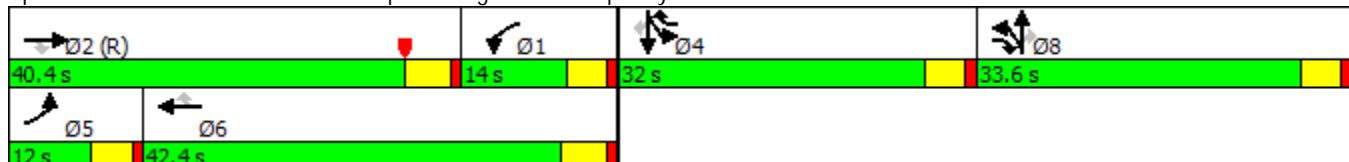


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↑	↗	↖↗	↑↑	↗	↖	↖↑	↗	↖	↑↑	↗
Traffic Volume (vph)	58	403	125	229	211	407	171	602	245	45	721	278
Future Volume (vph)	58	403	125	229	211	407	171	602	245	45	721	278
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	8	1	6	4	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	39.1	33.6	9.6	39.1	22.6	33.6	33.6	33.6	22.6	22.6	22.6
Total Split (s)	12.0	40.4	33.6	14.0	42.4	32.0	33.6	33.6	33.6	32.0	32.0	32.0
Total Split (%)	10.0%	33.7%	28.0%	11.7%	35.3%	26.7%	28.0%	28.0%	28.0%	26.7%	26.7%	26.7%
Yellow Time (s)	3.6	4.1	3.6	3.6	4.1	3.6	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lead	Lead		Lag	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	C-Max	Max	None	None	Max	Max	Max	Max	Max	Max	Max
Act Effect Green (s)	7.0	35.3	69.4	9.4	39.7	67.6	29.0	29.0	29.0	27.4	27.4	27.4
Actuated g/C Ratio	0.06	0.29	0.58	0.08	0.33	0.56	0.24	0.24	0.24	0.23	0.23	0.23
v/c Ratio	0.65	0.42	0.13	1.01	0.34	0.28	0.41	0.78	0.45	0.13	0.96	0.58
Control Delay	89.6	36.1	8.4	114.1	17.0	8.7	42.0	49.9	12.2	38.0	69.8	24.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.6	36.1	8.4	114.1	17.0	8.7	42.0	49.9	12.2	38.0	69.8	24.7
LOS	F	D	A	F	B	A	D	D	B	D	E	C
Approach Delay		35.5			41.3			39.6			56.4	
Approach LOS		D			D			D			E	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT, Start of Yellow
 Natural Cycle: 115
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.01
 Intersection Signal Delay: 44.4
 Intersection LOS: D
 Intersection Capacity Utilization 97.0%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)

























3/30/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	403	125	229	211	407	171	602	245	45	721	278
Future Volume (vph)	58	403	125	229	211	407	171	602	245	45	721	278
Ideal Flow (vphpl)	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lane Util. Factor	1.00	0.95	1.00	0.97	0.91	0.91	0.91	0.91	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99	0.99	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600	1376	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600	1376	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	64	443	137	252	232	447	188	662	269	49	792	305
RTOR Reduction (vph)	0	0	29	0	143	35	0	0	160	0	0	119
Lane Group Flow (vph)	64	443	108	252	313	188	169	681	109	49	792	186
Confl. Peds. (#/hr)			4			7			2			
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	5.9	34.4	63.4	10.3	38.8	66.2	29.0	29.0	29.0	27.4	27.4	27.4
Effective Green, g (s)	5.9	34.4	63.4	10.3	38.8	66.2	29.0	29.0	29.0	27.4	27.4	27.4
Actuated g/C Ratio	0.05	0.29	0.53	0.09	0.32	0.55	0.24	0.24	0.24	0.23	0.23	0.23
Clearance Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	83	1032	1020	274	1164	759	410	870	435	388	822	411
v/s Ratio Prot	c0.04	c0.12	0.03	c0.08	0.09	0.06	0.10	c0.19		0.03	c0.22	
v/s Ratio Perm			0.03			0.08			0.06			0.10
v/c Ratio	0.77	0.43	0.11	0.92	0.27	0.25	0.41	0.78	0.25	0.13	0.96	0.45
Uniform Delay, d1	56.4	34.8	14.1	54.4	30.1	14.0	38.3	42.6	36.7	36.8	45.8	39.8
Progression Factor	1.17	1.02	1.27	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	28.3	1.1	0.2	33.0	0.1	0.2	3.0	7.0	1.4	0.7	23.7	3.6
Delay (s)	94.0	36.7	18.2	87.4	30.2	14.1	41.4	49.5	38.1	37.5	69.5	43.4
Level of Service	F	D	B	F	C	B	D	D	D	D	E	D
Approach Delay (s)		38.4			41.8			45.5			61.2	
Approach LOS		D			D			D			E	

Intersection Summary		
HCM 2000 Control Delay	48.1	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.74	D
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	97.0%	18.9
Analysis Period (min)	15	ICU Level of Service
		F

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	403	125	229	211	407	171	602	245	45	721	278
Future Volume (veh/h)	58	403	125	229	211	407	171	602	245	45	721	278
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	64	443	94	252	232	420	188	662	234	49	792	268
Adj No. of Lanes	1	2	1	2	1	2	1	2	1	1	2	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	80	1006	818	658	836	2081	391	870	369	370	781	349
Arrive On Green	0.02	0.10	0.10	0.22	0.46	0.46	0.24	0.24	0.24	0.23	0.23	0.23
Sat Flow, veh/h	1619	3420	1524	3048	1800	2974	1619	3600	1526	1619	3420	1530
Grp Volume(v), veh/h	64	443	94	252	232	420	188	662	234	49	792	268
Grp Sat Flow(s),veh/h/ln	1619	1710	1524	1524	1800	1487	1619	1800	1526	1619	1710	1530
Q Serve(g_s), s	4.7	14.7	4.5	8.5	9.5	6.1	12.0	20.5	16.5	2.9	27.4	19.7
Cycle Q Clear(g_c), s	4.7	14.7	4.5	8.5	9.5	6.1	12.0	20.5	16.5	2.9	27.4	19.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	80	1006	818	658	836	2081	391	870	369	370	781	349
V/C Ratio(X)	0.80	0.44	0.11	0.38	0.28	0.20	0.48	0.76	0.63	0.13	1.01	0.77
Avail Cap(c_a), veh/h	100	1006	818	658	836	2081	391	870	369	370	781	349
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.76	0.76	0.76	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.4	44.9	17.9	40.2	19.7	6.6	39.0	42.3	40.8	36.8	46.3	43.3
Incr Delay (d2), s/veh	19.2	1.1	0.2	0.1	0.2	0.0	4.2	6.2	8.1	0.7	35.8	14.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	7.1	2.9	3.6	4.7	4.3	5.8	11.0	7.8	1.4	16.8	9.8
LnGrp Delay(d),s/veh	77.6	45.9	18.1	40.4	19.9	6.6	43.2	48.5	48.8	37.6	82.1	58.2
LnGrp LOS	E	D	B	D	B	A	D	D	D	D	F	E
Approach Vol, veh/h		601			904			1084			1109	
Approach Delay, s/veh		44.9			19.4			47.7			74.3	
Approach LOS		D			B			D			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	31.5	40.4		32.0	10.5	61.4		33.6				
Change Period (Y+Rc), s	5.1	* 5.1		4.6	4.6	5.1		4.6				
Max Green Setting (Gmax), s	9.4	* 35		27.4	7.4	37.3		29.0				
Max Q Clear Time (g_c+I1), s	10.5	16.7		29.4	6.7	11.5		22.5				
Green Ext Time (p_c), s	0.0	3.0		0.0	0.0	3.6		3.0				
Intersection Summary												
HCM 2010 Ctrl Delay			48.3									
HCM 2010 LOS			D									
Notes												

APPENDIX 5.2:

E+P CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

<u>DIST</u>	<u>CO</u>	<u>RTE</u>	<u>PM</u>	<u>CALC</u>	<u>TRAFFIC CONDITIONS</u>	<u>E+P</u>
Jurisdiction: <u>City of San Bernardino</u>				CHK <u>BA</u>	DATE <u>03/28/17</u>	
Major Street: <u>Washington Avenue</u>				Critical Approach Speed (Major) <u>25</u> mph	DATE <u>03/28/17</u>	
Minor Street: <u>Driveway 1</u>				Critical Approach Speed (Minor) <u>25</u> mph		

Major Street Approach Lanes = 1 lane Minor Street Approach Lanes: 1 lane

Major Street Future ADT = 661 vpd Minor Street Future ADT = 367 vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph);

or

In built up area of isolated community of < 10,000 population **URBAN (U)**

(Based on Estimated Average Daily Traffic - See Note)

<u>URBAN</u>	<u>RURAL</u>	Minimum Requirements EADT			
XX		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
CONDITION A - Minimum Vehicular Volume		<u>Urban</u>	<u>Rural</u>	<u>Urban</u>	<u>Rural</u>
<u>Satisfied</u>	<u>Not Satisfied</u>				
		Number of lanes for moving traffic on each approach		Number of lanes for moving traffic on each approach	
<u>Major Street</u>	<u>Minor Street</u>				
1 661	1 367	8,000	5,600	2,400	1,680
2 +	1	9,600	6,720	2,400	1,680
2 +	2 +	9,600	6,720	3,200	2,240
1	2 +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
<u>Satisfied</u>	<u>Not Satisfied</u>	<u>Urban</u>	<u>Rural</u>	<u>Urban</u>	<u>Rural</u>
	XX				
		Number of lanes for moving traffic on each approach		Number of lanes for moving traffic on each approach	
<u>Major Street</u>	<u>Minor Street</u>				
1 661	1 367	12,000	8,400	1,200	850
2 +	1	14,400	10,080	1,200	850
2 +	2 +	14,400	10,080	1,600	1,120
1	2 +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B		2 CONDITIONS 80%		2 CONDITIONS 80%	
<u>Satisfied</u>	<u>Not Satisfied</u>				
	XX				
No one condition satisfied, but following conditions fulfilled 80% of more					
	<u>A</u>				
	8%				
	<u>B</u>				
	6%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.



Figure 4C-3. Warrant 3, Peak Hour

Traffic Conditions = **E+P Conditions - Weekday PM Peak Hour**

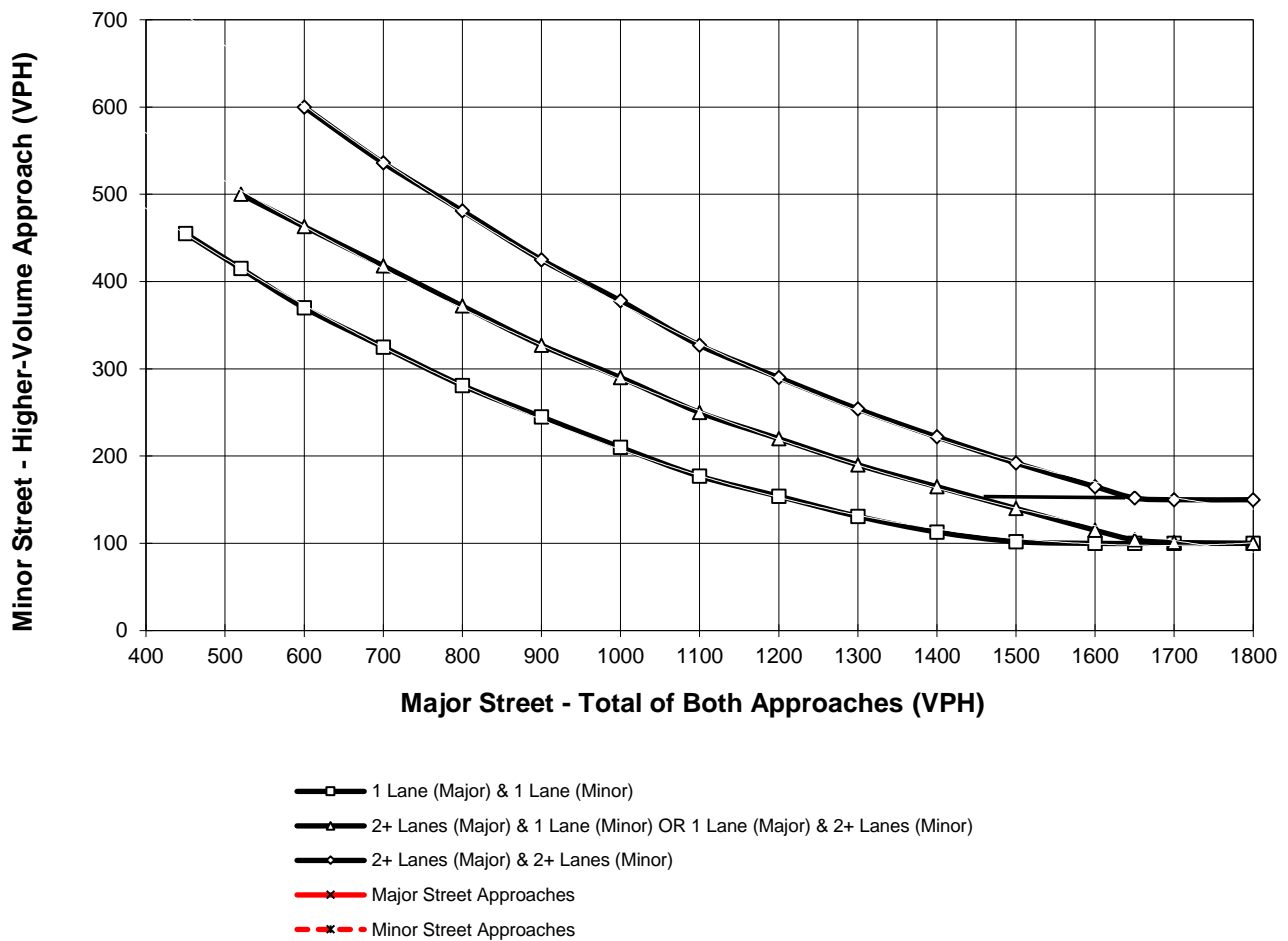
Major Street Name = **Dumas St.**

Total of Both Approaches (VPH) = **17**
 Number of Approach Lanes on Major Street = **1**

Minor Street Name = **Washington Av.**

High Volume Approach (VPH) = **15**
 Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 150 vph applies as the lower threshold for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-3. Warrant 3, Peak Hour

Traffic Conditions = **E+P (Alternative Access) Conditions - Weekday PM Peak Hour**

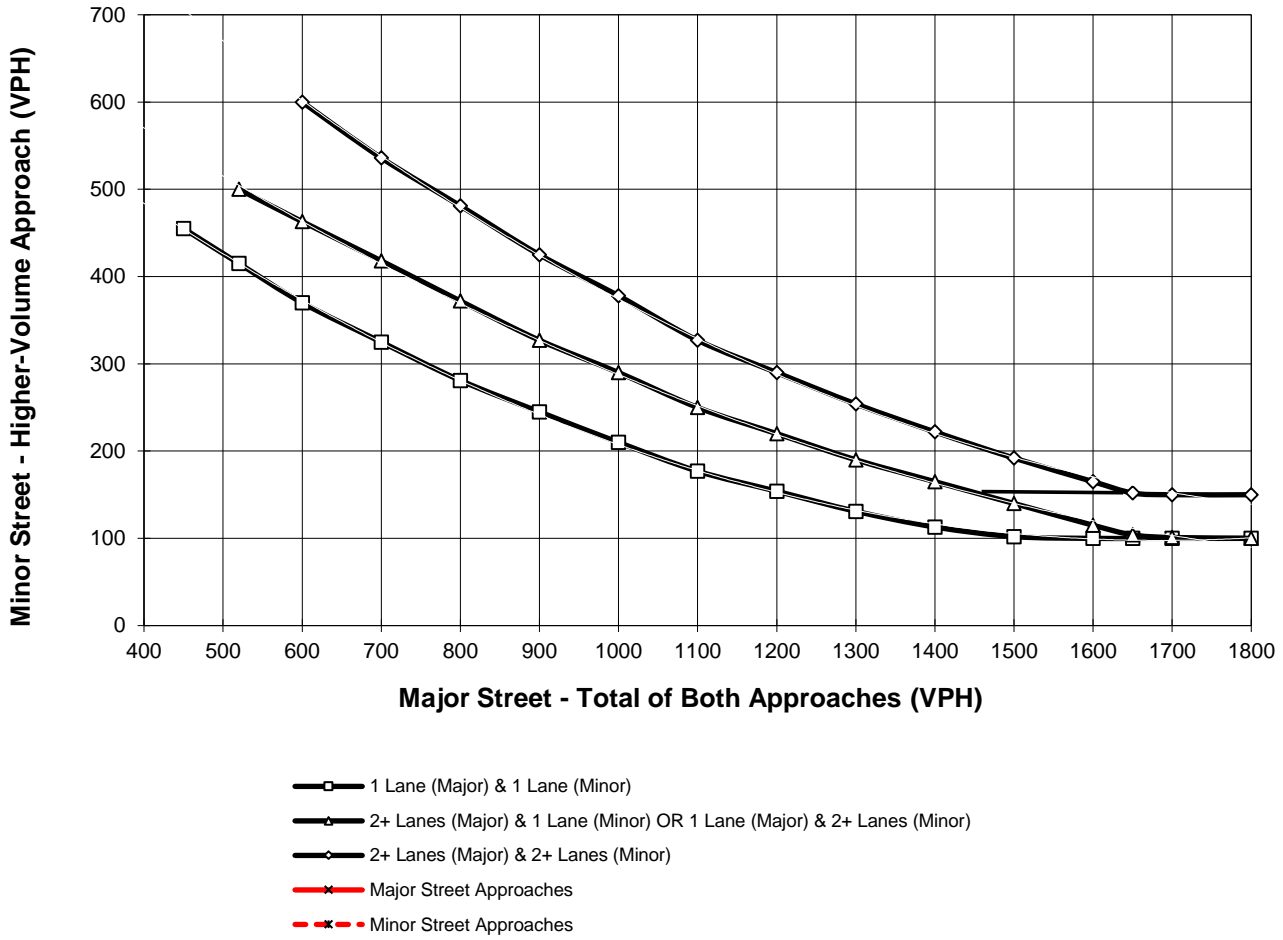
Major Street Name = **Washington Av.**

Total of Both Approaches (VPH) = **56**
 Number of Approach Lanes on Major Street = **1**

Minor Street Name = **Dumas St.**

High Volume Approach (VPH) = **18**
 Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 150 vph applies as the lower threshold for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold for a minor-street approach with one lane



Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **E+P Conditions - Weekday AM Peak Hour**

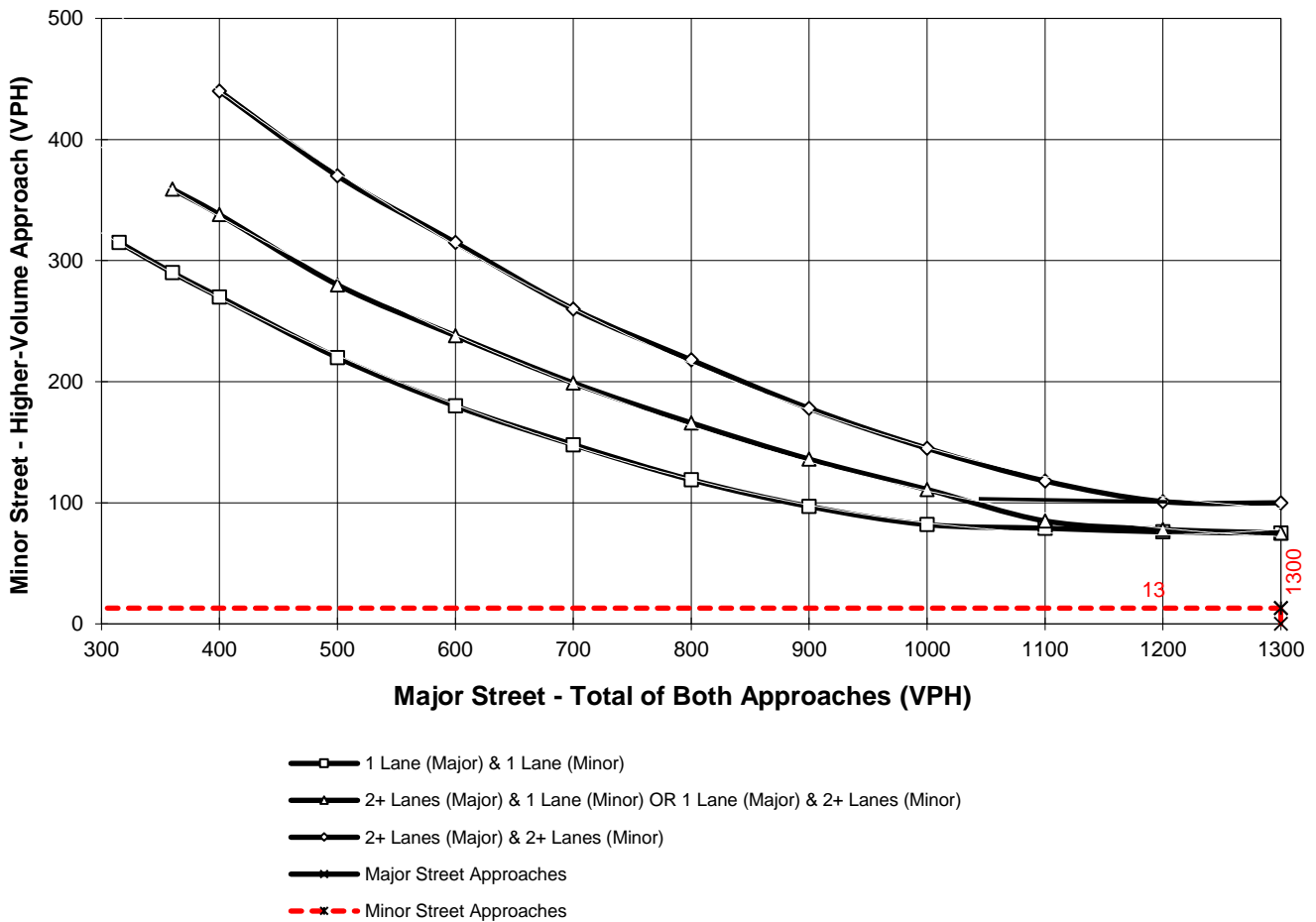
Major Street Name = **Waterman Av.**

Total of Both Approaches (VPH) = **1677**
 Number of Approach Lanes Major Street = **2**

Minor Street Name = **Dumas St.**

High Volume Approach (VPH) = **13**
 Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

APPENDIX 5.3:

E+P CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS

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Queues

1: I-215 SB Ramps & Auto Center Rd.



Lane Group	EBT	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	178	202	598	601	366
v/c Ratio	0.12	0.13	0.84	0.80	0.38
Control Delay	8.8	10.3	29.7	25.9	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	8.8	10.3	29.7	25.9	2.8
Queue Length 50th (ft)	15	26	195	191	0
Queue Length 95th (ft)	32	38	#381	#366	41
Internal Link Dist (ft)	663	209		2403	
Turn Bay Length (ft)					465
Base Capacity (vph)	1520	1500	708	750	963
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.12	0.13	0.84	0.80	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Queues

2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	76	1237	340	285	82	81	954
v/c Ratio	0.45	0.61	0.20	0.29	0.18	0.17	0.92
Control Delay	27.5	8.7	12.5	8.5	18.3	18.1	35.6
Queue Delay	0.0	0.5	0.0	0.0	0.0	0.0	20.7
Total Delay	27.5	9.2	12.5	8.5	18.3	18.1	56.3
Queue Length 50th (ft)	17	227	70	73	24	23	170
Queue Length 95th (ft)	m28	m298	m115	m139	54	54	#292
Internal Link Dist (ft)		295	473			974	
Turn Bay Length (ft)	270			230	315		275
Base Capacity (vph)	178	2040	1687	995	453	480	1035
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	360	0	0	0	0	113
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.74	0.20	0.29	0.18	0.17	1.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.



Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	523	38	447	25	472	488	668
v/c Ratio	0.54	0.38	0.37	0.08	0.52	0.51	0.61
Control Delay	41.0	64.2	31.6	0.5	21.4	21.0	13.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.0	64.2	31.6	0.5	21.4	21.0	13.0
Queue Length 50th (ft)	190	29	138	0	255	262	198
Queue Length 95th (ft)	256	65	184	0	364	368	323
Internal Link Dist (ft)	873		790			811	
Turn Bay Length (ft)		150			100		215
Base Capacity (vph)	970	136	1200	321	909	964	1103
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.28	0.37	0.08	0.52	0.51	0.61

Intersection Summary

Queues

16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

3/24/2017



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	82	179	58	43	708	312	668	186	8	373	87
v/c Ratio	0.27	0.13	0.05	0.25	0.59	0.70	0.70	0.31	0.03	0.63	0.20
Control Delay	42.1	23.8	1.2	53.0	17.2	46.0	41.4	8.1	39.1	48.4	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.1	23.8	1.2	53.0	17.2	46.0	41.4	8.1	39.1	48.4	1.1
Queue Length 50th (ft)	46	45	0	15	101	218	234	10	5	131	0
Queue Length 95th (ft)	107	73	9	34	135	329	303	65	20	182	0
Internal Link Dist (ft)		1015			1164		440			335	
Turn Bay Length (ft)	85		270	250		800		160	110		110
Base Capacity (vph)	314	1373	1220	212	1506	448	949	597	278	589	430
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.13	0.05	0.20	0.47	0.70	0.70	0.31	0.03	0.63	0.20

Intersection Summary

Queues

1: I-215 SB Ramps & Auto Center Rd.



Lane Group	EBT	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	638	341	342	353	279
v/c Ratio	0.40	0.22	0.49	0.48	0.31
Control Delay	10.5	6.2	16.1	15.7	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.5	6.2	16.1	15.7	2.8
Queue Length 50th (ft)	63	21	92	94	0
Queue Length 95th (ft)	98	26	161	163	37
Internal Link Dist (ft)	663	209		2403	
Turn Bay Length (ft)					465
Base Capacity (vph)	1593	1524	697	738	902
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.40	0.22	0.49	0.48	0.31

Intersection Summary

Queues

2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	227	799	880	676	63	62	939
v/c Ratio	1.28	0.39	0.61	0.60	0.14	0.13	0.80
Control Delay	184.4	4.8	12.4	4.3	17.8	17.7	20.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.6
Total Delay	184.4	4.9	12.4	4.3	17.8	17.7	20.6
Queue Length 50th (ft)	~98	24	133	70	17	17	119
Queue Length 95th (ft)	#220	47	m173	m94	45	44	#197
Internal Link Dist (ft)		295	473			974	
Turn Bay Length (ft)	270			230	315		275
Base Capacity (vph)	178	2040	1452	1129	453	480	1180
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	173	0	0	0	0	53
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.28	0.43	0.61	0.60	0.14	0.13	0.83

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Queues

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.



Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	698	23	608	67	334	337	408
v/c Ratio	0.49	0.28	0.38	0.27	0.49	0.46	0.44
Control Delay	29.8	63.8	23.0	2.6	30.3	29.6	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	63.8	23.0	2.6	30.3	29.6	5.9
Queue Length 50th (ft)	224	18	161	0	205	205	26
Queue Length 95th (ft)	286	46	208	0	302	297	96
Internal Link Dist (ft)	873		790			811	
Turn Bay Length (ft)		150			100		215
Base Capacity (vph)	1413	90	1608	333	685	726	937
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.26	0.38	0.20	0.49	0.46	0.44

Intersection Summary

Queues

16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

3/24/2017



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	64	443	137	252	679	169	681	269	49	792	305
v/c Ratio	0.65	0.42	0.13	1.01	0.46	0.41	0.78	0.45	0.13	0.96	0.58
Control Delay	89.6	36.1	8.4	114.1	12.8	42.0	49.9	12.2	38.0	69.8	24.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.6	36.1	8.4	114.1	12.8	42.0	49.9	12.2	38.0	69.8	24.7
Queue Length 50th (ft)	52	134	37	~103	77	121	272	35	30	321	102
Queue Length 95th (ft)	m#88	m173	m66	#191	133	196	346	111	65	#449	197
Internal Link Dist (ft)		1015			1164		440			335	
Turn Bay Length (ft)	85		270	250		800		160	110		110
Base Capacity (vph)	104	1059	1066	250	1474	410	870	595	388	822	529
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.42	0.13	1.01	0.46	0.41	0.78	0.45	0.13	0.96	0.58

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

APPENDIX 5.4:

E+P CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS

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BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Northbound
Agency or Company	Urban Crossroads, Inc.	From/To	North of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	5336	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			3
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain: Level
			Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.985
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1472	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	69.1	x f _p)	
D = v _p / S	21.3	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Northbound
Agency or Company	Urban Crossroads, Inc.	From/To	South of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6962	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			3
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.985
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1920	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	64.0	x f _p)	
D = v _p / S	30.0	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Southbound
Agency or Company	Urban Crossroads, Inc.	From/To	North of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6652	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			4
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
1475	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	69.1	x f _p)	
S	mph	S	mph
D = v _p / S	21.3	D = v _p / S	pc/mi/ln
21.3	pc/mi/ln	Required Number of Lanes, N	
LOS	C		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Southbound
Agency or Company	Urban Crossroads, Inc.	From/To	South of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6597	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			4
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain: Level
			Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	1463	Design LOS	
S	69.2	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	21.1	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Eastbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	7251	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			10
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.952
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2069	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	61.2	x f _p)	
S	mph	S	mph
D = v _p / S	33.8	D = v _p / S	pc/mi/ln
33.8	pc/mi/ln	Required Number of Lanes, N	
LOS	D		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Eastbound
Agency or Company	Urban Crossroads, Inc.	From/To	East of Waterman
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	6527	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 11
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)] 0.948	
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	1497 pc/h/ln	Design LOS	
S	69.0 mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	21.7 pc/mi/ln	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Westbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	4/3/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	7814	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			15
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.930
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2283	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	56.4	x f _p)	
mph		S	
D = v _p / S	40.5	mph	
pc/mi/ln		D = v _p / S	
LOS	E	pc/mi/ln	
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Westbound
Agency or Company	Urban Crossroads, Inc.	From/To	East of Waterman
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	E+P
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	8475	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			14
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.935
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2464	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	51.5	x f _p)	
S	mph	S	mph
D = v _p / S	47.9	D = v _p / S	pc/mi/ln
47.9	pc/mi/ln	Required Number of Lanes, N	
LOS	F		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Northbound
Agency or Company	Urban Crossroads, Inc.	From/To	North of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	6551	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			1
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.995
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1789	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	66.0	x f _p)	
D = v _p / S	27.1	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Northbound
Agency or Company	Urban Crossroads, Inc.	From/To	South of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	7550	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			2
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	2072	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	61.2	x f _p)	
D = v _p / S	33.9	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Southbound
Agency or Company	Urban Crossroads, Inc.	From/To	North of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	5483	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			2
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
1204	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	70.0	x f _p)	
S	mph	S	mph
D = v _p / S	17.2	D = v _p / S	pc/mi/ln
17.2	pc/mi/ln	Required Number of Lanes, N	
LOS	B		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Southbound
Agency or Company	Urban Crossroads, Inc.	From/To	South of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8200	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			3
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.985
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
1809	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	65.7	x f _p)	
S	mph	S	mph
D = v _p / S	27.5	D = v _p / S	pc/mi/ln
D	pc/mi/ln	Required Number of Lanes, N	
LOS	D		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Eastbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	6365	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			8
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.962
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
1799	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	65.8	x f _p)	
S	mph	S	mph
D = v _p / S	27.3	D = v _p / S	pc/mi/ln
pc/mi/ln		Required Number of Lanes, N	
LOS	D		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel <i>I-10 Eastbound</i>	
Agency or Company	<i>Urban Crossroads, Inc.</i>	From/To	<i>East of Waterman</i>
Date Performed	<i>3/20/2017</i>	Jurisdiction	<i>Caltrans</i>
Analysis Time Period	<i>PM Peak Hour</i>	Analysis Year	<i>E+P</i>
Project Description <i>Gateway South Building 4 TIA (JN 10187)</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6555	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			8
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			<i>Level</i>
			Grade % Length
			<i>mi</i>
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	
0.962			
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
1482	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	69.1	x f _p)	
mph		S	mph
D = v _p / S	21.5	D = v _p / S	pc/mi/ln
pc/mi/ln		Required Number of Lanes, N	
LOS	C		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Westbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	4/3/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	7781	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			17
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.922
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2294	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	56.1	x f _p)	
S	mph	S	mph
D = v _p / S	40.9	D = v _p / S	pc/mi/ln
40.9	pc/mi/ln	Required Number of Lanes, N	
LOS	E		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Westbound
Agency or Company	Urban Crossroads, Inc.	From/To	East of Waterman
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	E+P
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	7029	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			18
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.917
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	2082	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	61.0	x f _p)	
D = v _p / S	34.1	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

APPENDIX 5.5:

E+P CONDITIONS RAMP JUNCTION ANALYSIS WORKSHEETS

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RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information				Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound	Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Auto Center	Date Performed	3/20/2017
Date Performed	3/20/2017	Jurisdiction	Caltrans	Analysis Time Period	AM Peak Hour	Analysis Year	E+P	Project Description Gateway South Building 4 TIA (JN 10187)	
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp	Freeway Volume, V _F	5062				
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Volume, V _R	274				
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	240	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Free-Flow Speed, S _{FF}	65.0				
L _{up} = 1840 ft	Deceleration Lane Length L _D		L _{down} = ft	Ramp Free-Flow Speed, S _{FR}	45.0				
V _u = 946 veh/h			V _D = veh/h						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5062	0.92	Level	2	0	0.990	1.00	5557	
Ramp	274	0.92	Level	19	0	0.913	1.00	326	
UpStream	946	0.92	Level	2	0	0.990	1.00	1039	
DownStream									
Merge Areas				Diverge Areas					
Estimation of v₁₂				Estimation of v₁₂					
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.177 using Equation (Exhibit 13-6) V ₁₂ = 984 pc/h V ₃ or V _{av34} = 2286 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2222 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = V ₃ or V _{av34} = Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks				Capacity Checks					
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?		
V _{FO}	5883	Exhibit 13-8	No	V _F		Exhibit 13-8			
				V _{FO} = V _F - V _R		Exhibit 13-8			
				V _R		Exhibit 13-10			
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area					
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?		
V _{R12}	2548	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8			
Level of Service Determination (if not F)				Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 23.7 (pc/mi/ln) LOS = C (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					
Speed Determination				Speed Determination					
M _S = 0.349 (Exhibit 13-11)				D _s = (Exhibit 13-12)					
S _R = 57.0 mph (Exhibit 13-11)				S _R = mph (Exhibit 13-12)					
S ₀ = 60.8 mph (Exhibit 13-11)				S ₀ = mph (Exhibit 13-12)					
S = 59.1 mph (Exhibit 13-13)				S = mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	E+P						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N Ramp Number of Lanes, N Acceleration Lane Length, L _A Deceleration Lane Length L _D Freeway Volume, V _F Ramp Volume, V _R Freeway Free-Flow Speed, S _{FF} Ramp Free-Flow Speed, S _{FR}	4 2 975 6008 954 65.0 45.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off	L _{down} = 1260 ft V _D = 946 veh/h					
L _{up} = ft	V _u = veh/h								
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6008	0.92	Level	2	0	0.990	1.00	6596	
Ramp	954	0.92	Level	6	0	0.971	1.00	1068	
UpStream									
DownStream	946	0.92	Level	2	0	0.990	1.00	1039	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 2505 pc/h V ₃ or V _{av34} 2045 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2638 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	6596	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	5528	Exhibit 13-8	9400	No
					V _R	1068	Exhibit 13-10	4200	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	2505	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 7.9 (pc/mi/ln) LOS = A (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11)	S _R = mph (Exhibit 13-11)	S ₀ = mph (Exhibit 13-11)	S = mph (Exhibit 13-13)		D _S = 0.394 (Exhibit 13-12)	S _R = 55.9 mph (Exhibit 13-12)	S ₀ = 67.5 mph (Exhibit 13-12)	S = 62.3 mph (Exhibit 13-13)	

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	E+P						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	5	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	Freeway Volume, V _F	5229	L _{down} =	1790 ft	Freeway Free-Flow Speed, S _{FF}	65.0
L _{up} =	Ramp Number of Lanes, N	1	V _D =	Ramp Volume, V _R	1423			Ramp Free-Flow Speed, S _{FR}	45.0
V _u =	Acceleration Lane Length, L _A			Deceleration Lane Length L _D	180				
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5229	0.92	Level	4	0	0.980	1.00	5797	
Ramp	1423	0.92	Level	2	0	0.990	1.00	1562	
UpStream									
DownStream	688	0.92	Level	6	0	0.971	1.00	770	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 3030 pc/h V ₃ or V _{av34} 949 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	4928	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	3366	Exhibit 13-8	9400	No
					V _R	1562	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	3030	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 28.7 (pc/mi/ln) LOS = D (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S =	(Exhibit 13-11)				D _S =	0.439 (Exhibit 13-12)			
S _R =	mph (Exhibit 13-11)				S _R =	54.9 mph (Exhibit 13-12)			
S ₀ =	mph (Exhibit 13-11)				S ₀ =	71.3 mph (Exhibit 13-12)			
S =	mph (Exhibit 13-13)				S =	60.2 mph (Exhibit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Upstream)						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	E+P						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N		4		Downstream Adj Ramp				
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N		1		<input type="checkbox"/> Yes <input type="checkbox"/> On				
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A		200		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off				
L _{up} = 1070 ft	Deceleration Lane Length L _D				L _{down} = ft				
V _u = 688 veh/h	Freeway Volume, V _F		5917		V _D = veh/h				
	Ramp Volume, V _R		216						
	Freeway Free-Flow Speed, S _{FF}		65.0						
	Ramp Free-Flow Speed, S _{FR}		45.0						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5917	0.92	Level	4	0	0.980	1.00	6560	
Ramp	216	0.92	Level	17	0	0.922	1.00	255	
UpStream	688	0.92	Level	6	0	0.971	1.00	770	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.186 using Equation (Exhibit 13-6) V ₁₂ = 1220 pc/h V ₃ or V _{av34} = 2670 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2624 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	6815	Exhibit 13-8		No	V _F		Exhibit 13-8		
					V _{FO} = V _F - V _R		Exhibit 13-8		
					V _R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	2879	Exhibit 13-8	4600:All	No	V ₁₂		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 26.6 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = 0.372 (Exhibit 13-11)					D _s = (Exhibit 13-12)				
S _R = 56.4 mph (Exhibit 13-11)					S _R = mph (Exhibit 13-12)				
S ₀ = 59.7 mph (Exhibit 13-11)					S ₀ = mph (Exhibit 13-12)				
S = 58.3 mph (Exhibit 13-13)					S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information				Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Downstream)						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	E+P						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N Ramp Number of Lanes, N Acceleration Lane Length, L _A Deceleration Lane Length L _D Freeway Volume, V _F Ramp Volume, V _R Freeway Free-Flow Speed, S _{FF} Ramp Free-Flow Speed, S _{FR}	5 1 200 6507 216 65.0 45.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	L _{down} = 1115 ft V _D = 90 veh/h					
L _{up} = ft V _u = veh/h									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6507	0.92	Level	4	0	0.980	1.00	7214	
Ramp	216	0.92	Level	17	0	0.922	1.00	255	
UpStream									
DownStream	90	0.92	Level	6	0	0.971	1.00	101	
Merge Areas				Diverge Areas					
Estimation of v ₁₂				Estimation of v ₁₂					
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.186 using Equation (Exhibit 13-6) V ₁₂ = 979 pc/h V ₃ or V _{av34} = 2144 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2106 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks				Capacity Checks					
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?		
V _{FO}	5522	Exhibit 13-8	No	V _F		Exhibit 13-8			
				V _{FO} = V _F - V _R		Exhibit 13-8			
				V _R		Exhibit 13-10			
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area					
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?		
V _{R12}	2361	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8			
Level of Service Determination (if not F)				Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 22.5 (pc/mi/ln) LOS = C (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					
Speed Determination				Speed Determination					
M _S = 0.344 (Exhibit 13-11) S _R = 57.1 mph (Exhibit 13-11) S ₀ = 61.1 mph (Exhibit 13-11) S = 59.3 mph (Exhibit 13-13)								D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)	

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Eastbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Waterman						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	E+P						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	4	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	Freeway Volume, V _F	6126	L _{down} =	2950 ft	Freeway Free-Flow Speed, S _{FF}	65.0
L _{up} =	Ramp Number of Lanes, N	1	V _D =	Ramp Volume, V _R	1125			Ramp Free-Flow Speed, S _{FR}	45.0
V _u =	Acceleration Lane Length, L _A			Freeway Free-Flow Speed, S _{FF}	65.0				
	Deceleration Lane Length L _D	1500		Ramp Free-Flow Speed, S _{FR}	45.0				
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6126	0.92	Level	11	0	0.948	1.00	7025	
Ramp	1125	0.92	Level	3	0	0.985	1.00	1241	
UpStream									
DownStream	401	0.92	Level	7	0	0.966	1.00	451	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 3763 pc/h V ₃ or V _{av34} 1631 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	7025	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	5784	Exhibit 13-8	9400	No
					V _R	1241	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	3763	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 23.1 (pc/mi/ln) LOS = C (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S =	(Exhibit 13-11)				D _S =	0.410 (Exhibit 13-12)			
S _R =	mph (Exhibit 13-11)				S _R =	55.6 mph (Exhibit 13-12)			
S ₀ =	mph (Exhibit 13-11)				S ₀ =	68.8 mph (Exhibit 13-12)			
S =	mph (Exhibit 13-13)				S =	61.0 mph (Exhibit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Eastbound						
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	E+P						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp						
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On						
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	1500	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off						
L _{up} = 2950 ft	Deceleration Lane Length L _D		L _{down} = ft						
V _u = 1125 veh/h	Freeway Volume, V _F	6126	V _D = veh/h						
	Ramp Volume, V _R	401							
	Freeway Free-Flow Speed, S _{FF}	65.0							
	Ramp Free-Flow Speed, S _{FR}	45.0							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6126	0.92	Level	11	0	0.948	1.00	7025	
Ramp	401	0.92	Level	7	0	0.966	1.00	451	
UpStream	1125	0.92	Level	3	0	0.985	1.00	1241	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.161 using Equation (Exhibit 13-6) V ₁₂ = 1134 pc/h V ₃ or V _{av34} = 2945 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2810 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity	LOS F?			Actual	Capacity	LOS F?	
V _{FO}	7476	Exhibit 13-8	No		V _F	Exhibit 13-8			
					V _{FO} = V _F - V _R	Exhibit 13-8			
					V _R	Exhibit 13-10			
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}	3261	Exhibit 13-8	4600:All		No	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 21.3 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = 0.288 (Exhibit 13-11)					D _s = (Exhibit 13-12)				
S _R = 58.4 mph (Exhibit 13-11)					S _R = mph (Exhibit 13-12)				
S ₀ = 59.2 mph (Exhibit 13-11)					S ₀ = mph (Exhibit 13-12)				
S = 58.8 mph (Exhibit 13-13)					S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET								
General Information				Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Westbound					
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman					
Date Performed	4/3/2017	Jurisdiction	Caltrans					
Analysis Time Period	AM Peak Hour	Analysis Year	E+P					
Project Description Gateway South Building 4 TIA (JN 10187)								
Inputs								
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp					
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On					
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	1500	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off					
L _{up} = 1815 ft	Deceleration Lane Length L _D		L _{down} = ft					
V _u = 915 veh/h	Freeway Volume, V _F	7560	V _D = veh/h					
	Ramp Volume, V _R	254						
	Freeway Free-Flow Speed, S _{FF}	65.0						
	Ramp Free-Flow Speed, S _{FR}	45.0						
Conversion to pc/h Under Base Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	7560	0.92	Level	15	0	0.930	1.00	8834
Ramp	254	0.92	Level	9	0	0.957	1.00	289
UpStream	915	0.92	Level	3	0	0.985	1.00	1009
DownStream								
Merge Areas				Diverge Areas				
Estimation of v ₁₂				Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)				
L _{EQ} =	0.182 using Equation (Exhibit 13-6)			L _{EQ} =	using Equation (Exhibit 13-7)			
P _{FM} =	1605 pc/h			P _{FD} =	pc/h			
V ₁₂ =	3614 pc/h (Equation 13-14 or 13-17)			V ₁₂ =	pc/h (Equation 13-14 or 13-17)			
V ₃ or V _{av34}	Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			V ₃ or V _{av34}	Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No			
	Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No			
If Yes, V _{12a} =	3533 pc/h (Equation 13-16, 13-18, or 13-19)			If Yes, V _{12a} =	pc/h (Equation 13-16, 13-18, or 13-19)			
Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}	9123	Exhibit 13-8	No	V _F		Exhibit 13-8		
				V _{FO} = V _F - V _R		Exhibit 13-8		
				V _R		Exhibit 13-10		
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}	3822	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)				Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$				
D _R =	25.7 (pc/mi/ln)			D _R =	(pc/mi/ln)			
LOS =	C (Exhibit 13-2)			LOS =	(Exhibit 13-2)			
Speed Determination				Speed Determination				
M _S =	0.364 (Exhibit 13-11)			D _s =	(Exhibit 13-12)			
S _R =	56.6 mph (Exhibit 13-11)			S _R =	mph (Exhibit 13-12)			
S ₀ =	56.4 mph (Exhibit 13-11)			S ₀ =	mph (Exhibit 13-12)			
S =	56.5 mph (Exhibit 13-13)			S =	mph (Exhibit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst	BA	Freeway/Dir of Travel	I-10 Westbound							
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Waterman							
Date Performed	3/20/2017	Jurisdiction	Caltrans							
Analysis Time Period	AM Peak Hour	Analysis Year	E+P							
Project Description Gateway South Building 4 TIA (JN 10187)										
Inputs										
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N Ramp Number of Lanes, N Acceleration Lane Length, L _A Deceleration Lane Length L _D Freeway Volume, V _F Ramp Volume, V _R Freeway Free-Flow Speed, S _{FF} Ramp Free-Flow Speed, S _{FR}	4 1 1500 7560 915 65.0 45.0					Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 1815 ft V _D = 248 veh/h			
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	7560	0.92	Level	15	0	0.930	1.00	8834		
Ramp	915	0.92	Level	3	0	0.985	1.00	1009		
UpStream										
DownStream	248	0.92	Level	9	0	0.957	1.00	282		
Merge Areas					Diverge Areas					
Estimation of v ₁₂					Estimation of v ₁₂					
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 4421 pc/h V ₃ or V _{av34} 2206 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 13-8			V _F	8834	Exhibit 13-8	9400	No	
					V _{FO} = V _F - V _R	7825	Exhibit 13-8	9400	No	
					V _R	1009	Exhibit 13-10	2100	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?		
V _{R12}		Exhibit 13-8			V ₁₂	4421	Exhibit 13-8	4400:All	Yes	
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 28.8 (pc/mi/ln) LOS = D (Exhibit 13-2)					
Speed Determination					Speed Determination					
M _S = (Exhibit 13-11)					D _S = 0.389 (Exhibit 13-12)					
S _R = mph (Exhibit 13-11)					S _R = 56.1 mph (Exhibit 13-12)					
S ₀ = mph (Exhibit 13-11)					S ₀ = 66.6 mph (Exhibit 13-12)					
S = mph (Exhibit 13-13)					S = 60.9 mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET								
General Information				Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound					
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Auto Center					
Date Performed	3/20/2017	Jurisdiction	Caltrans					
Analysis Time Period	PM Peak Hour	Analysis Year	E+P					
Project Description Gateway South Building 4 TIA (JN 10187)								
Inputs								
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp					
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On					
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	240	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off					
L _{up} = 1840 ft	Deceleration Lane Length L _D		L _{down} = ft					
V _u = 898 veh/h	Freeway Volume, V _F	5685	V _D = veh/h					
	Ramp Volume, V _R	866						
	Freeway Free-Flow Speed, S _{FF}	65.0						
	Ramp Free-Flow Speed, S _{FR}	45.0						
Conversion to pc/h Under Base Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	5685	0.92	Level	1	0	0.995	1.00	6210
Ramp	866	0.92	Level	3	0	0.985	1.00	955
UpStream	898	0.92	Level	2	0	0.990	1.00	986
DownStream								
Merge Areas				Diverge Areas				
Estimation of v ₁₂				Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.098 using Equation (Exhibit 13-6) V ₁₂ = 611 pc/h V ₃ or V _{av34} = 2799 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2484 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}	7165	Exhibit 13-8	No	V _F		Exhibit 13-8		
				V _{FO} = V _F - V _R		Exhibit 13-8		
				V _R		Exhibit 13-10		
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}	3439	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)				Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 30.4 (pc/mi/ln) LOS = D (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination				Speed Determination				
M _S = 0.421 (Exhibit 13-11)				D _s = (Exhibit 13-12)				
S _R = 55.3 mph (Exhibit 13-11)				S _R = mph (Exhibit 13-12)				
S ₀ = 60.1 mph (Exhibit 13-11)				S ₀ = mph (Exhibit 13-12)				
S = 57.7 mph (Exhibit 13-13)				S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound							
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center							
Date Performed	3/20/2017	Jurisdiction	Caltrans							
Analysis Time Period	PM Peak Hour	Analysis Year	E+P							
Project Description Gateway South Building 4 TIA (JN 10187)										
Inputs										
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	4	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Ramp Number of Lanes, N	2	L _{down} =	1260 ft	Freeway Volume, V _F	6583	
L _{up} =	ft	Acceleration Lane Length, L _A		Deceleration Lane Length L _D	975	V _D =	898 veh/h	Ramp Volume, V _R	967	
V _u =	veh/h	Freeway Free-Flow Speed, S _{FF}		Ramp Free-Flow Speed, S _{FR}	45.0			Freeway Free-Flow Speed, S _{FF}	65.0	
								Ramp Free-Flow Speed, S _{FR}	45.0	
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	6583	0.92	Level	1	0	0.995	1.00	7191		
Ramp	967	0.92	Level	5	0	0.976	1.00	1077		
UpStream										
DownStream	898	0.92	Level	2	0	0.990	1.00	986		
Merge Areas					Diverge Areas					
Estimation of v ₁₂					Estimation of v ₁₂					
L _{EQ} =	V ₁₂ = V _F (P _{FM}) (Equation 13-6 or 13-7)				L _{EQ} =	V ₁₂ = V _R + (V _F - V _R)P _{FD} (Equation 13-12 or 13-13)				
P _{FM} =	using Equation (Exhibit 13-6)				P _{FD} =	0.260 using Equation (Exhibit 13-7)				
V ₁₂ =	pc/h				V ₁₂ =	2667 pc/h				
V ₃ or V _{av34}	pc/h (Equation 13-14 or 13-17)				V ₃ or V _{av34}	2262 pc/h (Equation 13-14 or 13-17)				
Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, V _{12a} =	pc/h (Equation 13-16, 13-18, or 13-19)				If Yes, V _{12a} =	2876 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 13-8			V _F	7191	Exhibit 13-8		9400	No
					V _{FO} = V _F - V _R	6114	Exhibit 13-8		9400	No
					V _R	1077	Exhibit 13-10		4200	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	2667	Exhibit 13-8		4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
D _R =	5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A				D _R =	4.252 + 0.0086 V ₁₂ - 0.009 L _D				
D _R =	(pc/mi/ln)				D _R =	9.9 (pc/mi/ln)				
LOS =	(Exhibit 13-2)				LOS =	A (Exhibit 13-2)				
Speed Determination					Speed Determination					
M _S =	(Exhibit 13-11)				D _S =	0.395 (Exhibit 13-12)				
S _R =	mph (Exhibit 13-11)				S _R =	55.9 mph (Exhibit 13-12)				
S ₀ =	mph (Exhibit 13-11)				S ₀ =	66.8 mph (Exhibit 13-12)				
S =	mph (Exhibit 13-13)				S =	62.0 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	E+P						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	5	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	Freeway Volume, V _F	4613	L _{down} =	1790 ft	Freeway Free-Flow Speed, S _{FF}	65.0
L _{up} =	Ramp Number of Lanes, N	1	V _D =	Ramp Volume, V _R	870				
V _u =	Acceleration Lane Length, L _A								
	Deceleration Lane Length L _D	180							
	Freeway Free-Flow Speed, S _{FF}	65.0							
	Ramp Free-Flow Speed, S _{FR}	45.0							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	4613	0.92	Level	1	0	0.995	1.00	5039	
Ramp	870	0.92	Level	6	0	0.971	1.00	974	
UpStream									
DownStream	1048	0.92	Level	3	0	0.985	1.00	1156	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 2527 pc/h V ₃ or V _{av34} 1004 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	4536	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	3562	Exhibit 13-8	9400	No
					V _R	974	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	2527	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 24.4 (pc/mi/ln) LOS = C (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S =	(Exhibit 13-11)				D _S =	0.386 (Exhibit 13-12)			
S _R =	mph (Exhibit 13-11)				S _R =	56.1 mph (Exhibit 13-12)			
S ₀ =	mph (Exhibit 13-11)				S ₀ =	71.3 mph (Exhibit 13-12)			
S =	mph (Exhibit 13-13)				S =	62.0 mph (Exhibit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Upstream)						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	E+P						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N		4		Downstream Adj Ramp				
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N		1		<input type="checkbox"/> Yes <input type="checkbox"/> On				
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A		200		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off				
L _{up} = 1070 ft	Deceleration Lane Length L _D				L _{down} = ft				
V _u = 1048 veh/h	Freeway Volume, V _F		5661		V _D = veh/h				
	Ramp Volume, V _R		614						
	Freeway Free-Flow Speed, S _{FF}		65.0						
	Ramp Free-Flow Speed, S _{FR}		45.0						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5661	0.92	Level	2	0	0.990	1.00	6215	
Ramp	614	0.92	Level	5	0	0.976	1.00	684	
UpStream	1048	0.92	Level	3	0	0.985	1.00	1156	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.132 using Equation (Exhibit 13-6) V ₁₂ = 822 pc/h V ₃ or V _{av34} = 2696 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2486 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	6899	Exhibit 13-8		No	V _F		Exhibit 13-8		
					V _{FO} = V _F - V _R		Exhibit 13-8		
					V _R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	3170	Exhibit 13-8	4600:All	No	V ₁₂		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 28.6 (pc/mi/ln) LOS = D (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = 0.396 (Exhibit 13-11) S _R = 55.9 mph (Exhibit 13-11) S ₀ = 60.1 mph (Exhibit 13-11) S = 58.1 mph (Exhibit 13-13)					D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information				Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Downstream)						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	E+P						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N Ramp Number of Lanes, N Acceleration Lane Length, L _A Deceleration Lane Length L _D	5 1 200	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	L _{up} = V _u =	ft veh/h	Freeway Volume, V _F Ramp Volume, V _R Freeway Free-Flow Speed, S _{FF} Ramp Free-Flow Speed, S _{FR}	7938 614 65.0 45.0	L _{down} = V _D =	1115 ft 262 veh/h
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	7938	0.92	Level	2	0	0.990	1.00	8715	
Ramp	614	0.92	Level	5	0	0.976	1.00	684	
UpStream									
DownStream	262	0.92	Level	5	0	0.976	1.00	292	
Merge Areas				Diverge Areas					
Estimation of v ₁₂				Estimation of v ₁₂					
L _{EQ} = P _{FM} = V ₁₂ = V ₃ or V _{av34} Is V ₃ or V _{av34} > 2,700 pc/h? Is V ₃ or V _{av34} > 1.5 * V _{12/2} If Yes, V _{12a} =	$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) 0.132 using Equation (Exhibit 13-6) 822 pc/h 2696 pc/h (Equation 13-14 or 13-17) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No 2486 pc/h (Equation 13-16, 13-18, or 13-19)			$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) using Equation (Exhibit 13-7) pc/h pc/h (Equation 13-14 or 13-17) <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks				Capacity Checks					
V _{FO}	Actual	Capacity	LOS F?	V _F	Actual	Capacity	LOS F?		
	6899	Exhibit 13-8	No	V _{FO} = V _F - V _R		Exhibit 13-8			
				V _R		Exhibit 13-10			
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area					
V _{R12}	Actual	Max Desirable	Violation?	V ₁₂	Actual	Max Desirable	Violation?		
	3170	Exhibit 13-8	4600:All No			Exhibit 13-8			
Level of Service Determination (if not F)				Level of Service Determination (if not F)					
D _R = D _R = LOS =	$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ 28.6 (pc/mi/ln) D (Exhibit 13-2)			$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ (pc/mi/ln) (Exhibit 13-2)					
Speed Determination				Speed Determination					
M _S = S _R = S ₀ = S =	0.396 (Exhibit 13-11) 55.9 mph (Exhibit 13-11) 60.1 mph (Exhibit 13-11) 58.1 mph (Exhibit 13-13)			(Exhibit 13-12) mph (Exhibit 13-12) mph (Exhibit 13-12) mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET											
General Information					Site Information						
Analyst	BA	Freeway/Dir of Travel	I-10 Eastbound								
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Waterman								
Date Performed	3/20/2017	Jurisdiction	Caltrans								
Analysis Time Period	PM Peak Hour	Analysis Year	E+P								
Project Description Gateway South Building 4 TIA (JN 10187)											
Inputs											
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	4	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	Freeway Volume, V _F	5704	L _{down} =	2950 ft	Freeway Free-Flow Speed, S _{FF}	65.0	V _D =	851 veh/h
L _{up} =	Ramp Number of Lanes, N	1	L _{down} =	Ramp Volume, V _R	661	V _D =	851 veh/h	Ramp Free-Flow Speed, S _{FR}	45.0		
V _u =	Acceleration Lane Length, L _A			Freeway Free-Flow Speed, S _{FF}	65.0			Ramp Free-Flow Speed, S _{FR}	45.0		
	Deceleration Lane Length L _D	1500									
Conversion to pc/h Under Base Conditions											
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p			
Freeway	5704	0.92	Level	8	0	0.962	1.00	6448			
Ramp	661	0.92	Level	3	0	0.985	1.00	729			
UpStream											
DownStream	851	0.92	Level	4	0	0.980	1.00	943			
Merge Areas					Diverge Areas						
Estimation of v ₁₂					Estimation of v ₁₂						
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 3222 pc/h V ₃ or V _{av34} 1613 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)						
Capacity Checks					Capacity Checks						
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?		
V _{FO}		Exhibit 13-8			V _F	6448	Exhibit 13-8	9400	No		
					V _{FO} = V _F - V _R	5719	Exhibit 13-8	9400	No		
					V _R	729	Exhibit 13-10	2100	No		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area						
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?			
V _{R12}		Exhibit 13-8			V ₁₂	3222	Exhibit 13-8	4400:All	No		
Level of Service Determination (if not F)					Level of Service Determination (if not F)						
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 18.5 (pc/mi/ln) LOS = B (Exhibit 13-2)						
Speed Determination					Speed Determination						
M _S =	(Exhibit 13-11)				D _S =	0.364 (Exhibit 13-12)					
S _R =	mph (Exhibit 13-11)				S _R =	56.6 mph (Exhibit 13-12)					
S ₀ =	mph (Exhibit 13-11)				S ₀ =	68.9 mph (Exhibit 13-12)					
S =	mph (Exhibit 13-13)				S =	62.2 mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Eastbound						
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	E+P						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp						
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On						
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	1500	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off						
L _{up} = 2950 ft	Deceleration Lane Length L _D		L _{down} = ft						
V _u = 661 veh/h	Freeway Volume, V _F	5704	V _D = veh/h						
	Ramp Volume, V _R	851							
	Freeway Free-Flow Speed, S _{FF}	65.0							
	Ramp Free-Flow Speed, S _{FR}	45.0							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5704	0.92	Level	8	0	0.962	1.00	6448	
Ramp	851	0.92	Level	4	0	0.980	1.00	943	
UpStream	661	0.92	Level	3	0	0.985	1.00	729	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.100 using Equation (Exhibit 13-6) V ₁₂ = 644 pc/h V ₃ or V _{av34} = 2902 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2579 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity	LOS F?			Actual	Capacity	LOS F?	
V _{FO}	7391	Exhibit 13-8	No		V _F	Exhibit 13-8			
					V _{FO} = V _F - V _R	Exhibit 13-8			
					V _R	Exhibit 13-10			
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}	3522	Exhibit 13-8	4600:All		No	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 23.1 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = 0.318 (Exhibit 13-11)					D _s = (Exhibit 13-12)				
S _R = 57.7 mph (Exhibit 13-11)					S _R = mph (Exhibit 13-12)				
S ₀ = 59.8 mph (Exhibit 13-11)					S ₀ = mph (Exhibit 13-12)				
S = 58.8 mph (Exhibit 13-13)					S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Westbound						
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman						
Date Performed	4/3/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	E+P						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp						
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On						
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	1500	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off						
L _{up} = 1815 ft	Deceleration Lane Length L _D		L _{down} = ft						
V _u = 471 veh/h	Freeway Volume, V _F	6558	V _D = veh/h						
	Ramp Volume, V _R	1223							
	Freeway Free-Flow Speed, S _{FF}	65.0							
	Ramp Free-Flow Speed, S _{FR}	45.0							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6558	0.92	Level	20	0	0.909	1.00	7841	
Ramp	1223	0.92	Level	1	0	0.995	1.00	1336	
UpStream	471	0.92	Level	3	0	0.985	1.00	520	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.051 using Equation (Exhibit 13-6) V ₁₂ = 398 pc/h V ₃ or V _{av34} = 3721 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 3136 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity	LOS F?			Actual	Capacity	LOS F?	
V _{FO}	9177	Exhibit 13-8	No		V _F	Exhibit 13-8			
					V _{FO} = V _F - V _R	Exhibit 13-8			
					V _R	Exhibit 13-10			
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}	4472	Exhibit 13-8	4600:All No		V ₁₂	Exhibit 13-8			
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 30.3 (pc/mi/ln) LOS = D (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = 0.527 (Exhibit 13-11)					D _s = (Exhibit 13-12)				
S _R = 52.9 mph (Exhibit 13-11)					S _R = mph (Exhibit 13-12)				
S ₀ = 58.2 mph (Exhibit 13-11)					S ₀ = mph (Exhibit 13-12)				
S = 55.5 mph (Exhibit 13-13)					S = mph (Exhibit 13-13)				

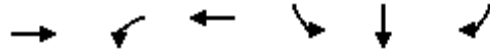
RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Westbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Waterman						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	E+P						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N 4				Downstream Adj Ramp				
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N 1				<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On				
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A				<input type="checkbox"/> No <input type="checkbox"/> Off				
L _{up} = ft	Deceleration Lane Length L _D 1500				L _{down} = 1815 ft				
V _u = veh/h	Freeway Volume, V _F 6558				V _D = 1206 veh/h				
	Ramp Volume, V _R 471								
	Freeway Free-Flow Speed, S _{FF} 65.0								
	Ramp Free-Flow Speed, S _{FR} 45.0								
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6558	0.92	Level	20	0	0.909	1.00	7841	
Ramp	471	0.92	Level	3	0	0.985	1.00	520	
UpStream									
DownStream	1206	0.92	Level	1	0	0.995	1.00	1317	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 3712 pc/h V ₃ or V _{av34} 2064 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	7841	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	7321	Exhibit 13-8	9400	No
					V _R	520	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	3712	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 22.7 (pc/mi/ln) LOS = C (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S =	(Exhibit 13-11)				D _S =	0.345 (Exhibit 13-12)			
S _R =	mph (Exhibit 13-11)				S _R =	57.1 mph (Exhibit 13-12)			
S ₀ =	mph (Exhibit 13-11)				S ₀ =	67.2 mph (Exhibit 13-12)			
S =	mph (Exhibit 13-13)				S =	62.0 mph (Exhibit 13-13)			

APPENDIX 6.1:

EA (2018) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Timings
1: I-215 SB Ramps & Auto Center Rd.

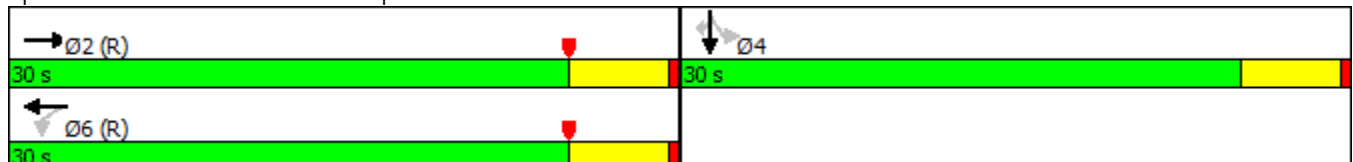


Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Configurations	↑↑		↑↑	↘	↙	↗
Traffic Volume (vph)	136	1	194	1068	67	354
Future Volume (vph)	136	1	194	1068	67	354
Turn Type	NA	Perm	NA	Perm	NA	Perm
Protected Phases	2		6		4	
Permitted Phases		6		4		4
Detector Phase	2	6	6	4	4	4
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	30.0	22.5	22.5	22.5	22.5	22.5
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0		5.0	5.0	5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	Max	Max	Max
Act Effect Green (s)	25.0		25.0	25.0	25.0	25.0
Actuated g/C Ratio	0.42		0.42	0.42	0.42	0.42
v/c Ratio	0.12		0.14	0.85	0.81	0.39
Control Delay	8.8		10.5	30.2	26.2	2.8
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	8.8		10.5	30.2	26.2	2.8
LOS	A		B	C	C	A
Approach Delay	8.8		10.5		22.2	
Approach LOS	A		B		C	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 2 (3%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.85
 Intersection Signal Delay: 19.7
 Intersection Capacity Utilization 48.1%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 1: I-215 SB Ramps & Auto Center Rd.



HCM Signalized Intersection Capacity Analysis
1: I-215 SB Ramps & Auto Center Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017




















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑					↑	↑	↑
Traffic Volume (vph)	0	136	34	1	194	0	0	0	0	1068	67	354
Future Volume (vph)	0	136	34	1	194	0	0	0	0	1068	67	354
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		5.0			5.0					5.0	5.0	5.0
Lane Util. Factor		0.95			0.95					0.95	0.95	1.00
Frt		0.97			1.00					1.00	1.00	0.85
Flt Protected		1.00			1.00					0.95	0.96	1.00
Satd. Flow (prot)		3600			3600					1700	1800	1800
Flt Permitted		1.00			0.95					0.95	0.96	1.00
Satd. Flow (perm)		3600			3600					1700	1800	1800
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	145	36	1	206	0	0	0	0	1136	71	377
RTOR Reduction (vph)	0	21	0	0	0	0	0	0	0	0	0	220
Lane Group Flow (vph)	0	160	0	0	207	0	0	0	0	602	605	157
Turn Type		NA		Perm	NA					Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases				6						4		4
Actuated Green, G (s)		25.0			25.0					25.0	25.0	25.0
Effective Green, g (s)		25.0			25.0					25.0	25.0	25.0
Actuated g/C Ratio		0.42			0.42					0.42	0.42	0.42
Clearance Time (s)		5.0			5.0					5.0	5.0	5.0
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1500			1500					708	750	750
v/s Ratio Prot		0.04										
v/s Ratio Perm					0.06					c0.35	0.34	0.09
v/c Ratio		0.11			0.14					0.85	0.81	0.21
Uniform Delay, d1		10.7			10.8					15.8	15.4	11.2
Progression Factor		1.00			0.95					1.00	1.00	1.00
Incremental Delay, d2		0.1			0.2					12.2	9.1	0.6
Delay (s)		10.8			10.5					28.0	24.4	11.8
Level of Service		B			B					C	C	B
Approach Delay (s)		10.8			10.5			0.0			22.8	
Approach LOS		B			B			A			C	

Intersection Summary

HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	136	34	1	194	0	0	0	0	1068	67	354
Future Volume (veh/h)	0	136	34	1	194	0	0	0	0	1068	67	354
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1800	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	145	29	1	206	0				1187	0	272
Adj No. of Lanes	0	2	0	0	2	0				2	0	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1189	233	61	1397	0				1349	0	637
Arrive On Green	0.00	0.42	0.42	0.83	0.83	0.00				0.42	0.00	0.42
Sat Flow, veh/h	0	2943	558	2	3435	0				3238	0	1530
Grp Volume(v), veh/h	0	86	88	111	96	0				1187	0	272
Grp Sat Flow(s),veh/h/ln	0	1710	1702	1799	1556	0				1619	0	1530
Q Serve(g_s), s	0.0	1.8	1.9	0.0	0.7	0.0				20.3	0.0	7.6
Cycle Q Clear(g_c), s	0.0	1.8	1.9	0.7	0.7	0.0				20.3	0.0	7.6
Prop In Lane	0.00		0.33	0.01		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	713	709	810	648	0				1349	0	637
V/C Ratio(X)	0.00	0.12	0.12	0.14	0.15	0.00				0.88	0.00	0.43
Avail Cap(c_a), veh/h	0	713	709	810	648	0				1349	0	637
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	10.7	10.8	3.0	3.0	0.0				16.1	0.0	12.4
Incr Delay (d2), s/veh	0.0	0.3	0.4	0.4	0.5	0.0				8.4	0.0	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.9	1.0	0.4	0.4	0.0				10.5	0.0	3.5
LnGrp Delay(d),s/veh	0.0	11.1	11.1	3.3	3.5	0.0				24.6	0.0	14.5
LnGrp LOS		B	B	A	A					C		B
Approach Vol, veh/h		174			207						1459	
Approach Delay, s/veh		11.1			3.4						22.7	
Approach LOS		B			A						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		30.0		30.0		30.0						
Change Period (Y+Rc), s		5.0		5.0		5.0						
Max Green Setting (Gmax), s		25.0		25.0		25.0						
Max Q Clear Time (g_c+I1), s		3.9		22.3		2.7						
Green Ext Time (p_c), s		1.9		1.6		2.0						
Intersection Summary												
HCM 2010 Ctrl Delay				19.4								
HCM 2010 LOS				B								
Notes												

Timings

2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.

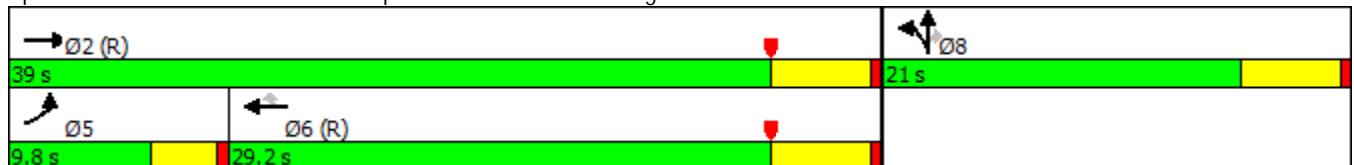


Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations	↶	↷	↷	↷	↶	↷	↷
Traffic Volume (vph)	71	1132	304	256	144	8	865
Future Volume (vph)	71	1132	304	256	144	8	865
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm
Protected Phases	5	2	6		8	8	
Permitted Phases				6			8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	8.0	8.0	8.0	5.0	5.0	5.0
Minimum Split (s)	8.5	39.0	13.0	13.0	10.0	10.0	10.0
Total Split (s)	9.8	39.0	29.2	29.2	21.0	21.0	21.0
Total Split (%)	16.3%	65.0%	48.7%	48.7%	35.0%	35.0%	35.0%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max
Act Effct Green (s)	6.0	34.0	28.1	28.1	16.0	16.0	16.0
Actuated g/C Ratio	0.10	0.57	0.47	0.47	0.27	0.27	0.27
v/c Ratio	0.46	0.61	0.20	0.28	0.19	0.17	0.92
Control Delay	27.8	8.8	12.3	8.2	18.3	18.1	35.3
Queue Delay	0.0	0.5	0.0	0.0	0.0	0.0	19.8
Total Delay	27.8	9.2	12.3	8.2	18.3	18.1	55.1
LOS	C	A	B	A	B	B	E
Approach Delay		10.3	10.4			49.6	
Approach LOS		B	B			D	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 1 (2%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 24.7
 Intersection LOS: C
 Intersection Capacity Utilization 73.3%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.



























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↖	↗↗			
Traffic Volume (vph)	71	1132	0	0	304	256	144	8	865	0	0	0
Future Volume (vph)	71	1132	0	0	304	256	144	8	865	0	0	0
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800	1700	1800	1800	1800	1800	1800
Total Lost time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	0.88			
Frbp, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.96	1.00			
Satd. Flow (prot)	1700	3600			3600	1800	1700	1800	3600			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.96	1.00			
Satd. Flow (perm)	1700	3600			3600	1800	1700	1800	3600			
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	78	1244	0	0	334	281	158	9	951	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	156	0	0	75	0	0	0
Lane Group Flow (vph)	78	1244	0	0	334	125	84	83	876	0	0	0
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	3.8	34.0			26.7	26.7	16.0	16.0	16.0			
Effective Green, g (s)	3.8	34.0			26.7	26.7	16.0	16.0	16.0			
Actuated g/C Ratio	0.06	0.57			0.44	0.44	0.27	0.27	0.27			
Clearance Time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Vehicle Extension (s)	2.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	107	2040			1602	801	453	480	960			
v/s Ratio Prot	0.05	c0.35			0.09		0.05	0.05				
v/s Ratio Perm						0.07			c0.24			
v/c Ratio	0.73	0.61			0.21	0.16	0.19	0.17	0.91			
Uniform Delay, d1	27.6	8.6			10.2	9.9	17.0	16.9	21.3			
Progression Factor	0.84	0.88			1.17	5.59	1.00	1.00	1.00			
Incremental Delay, d2	13.1	0.9			0.3	0.4	0.9	0.8	14.4			
Delay (s)	36.4	8.5			12.2	55.9	17.9	17.7	35.7			
Level of Service	D	A			B	E	B	B	D			
Approach Delay (s)		10.2			32.1			33.0			0.0	
Approach LOS		B			C			C			A	

Intersection Summary		
HCM 2000 Control Delay	23.0	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.76	C
Actuated Cycle Length (s)	60.0	Sum of lost time (s)
Intersection Capacity Utilization	73.3%	13.5
Analysis Period (min)	15	ICU Level of Service
		D

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 				 			
Traffic Volume (veh/h)	71	1132	0	0	304	256	144	8	865	0	0	0
Future Volume (veh/h)	71	1132	0	0	304	256	144	8	865	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1700	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	78	1244	0	0	334	199	164	0	792			
Adj No. of Lanes	1	2	0	0	2	1	2	0	2			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	98	1938	0	0	1531	685	863	0	816			
Arrive On Green	0.06	0.57	0.00	0.00	0.90	0.90	0.27	0.00	0.27			
Sat Flow, veh/h	1619	3510	0	0	3510	1530	3238	0	3060			
Grp Volume(v), veh/h	78	1244	0	0	334	199	164	0	792			
Grp Sat Flow(s),veh/h/ln	1619	1710	0	0	1710	1530	1619	0	1530			
Q Serve(g_s), s	2.9	14.9	0.0	0.0	0.8	1.1	2.3	0.0	15.4			
Cycle Q Clear(g_c), s	2.9	14.9	0.0	0.0	0.8	1.1	2.3	0.0	15.4			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	98	1938	0	0	1531	685	863	0	816			
V/C Ratio(X)	0.79	0.64	0.00	0.00	0.22	0.29	0.19	0.00	0.97			
Avail Cap(c_a), veh/h	170	1938	0	0	1531	685	863	0	816			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.86	0.86	1.00	0.00	1.00			
Uniform Delay (d), s/veh	27.8	8.9	0.0	0.0	1.8	1.8	17.0	0.0	21.8			
Incr Delay (d2), s/veh	5.4	1.6	0.0	0.0	0.3	0.9	0.5	0.0	25.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.4	7.4	0.0	0.0	0.4	0.6	1.1	0.0	9.3			
LnGrp Delay(d),s/veh	33.2	10.5	0.0	0.0	2.1	2.7	17.5	0.0	46.9			
LnGrp LOS	C	B			A	A	B		D			
Approach Vol, veh/h		1322			533			956				
Approach Delay, s/veh		11.8			2.3			41.8				
Approach LOS		B			A			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		39.0			7.1	31.9		21.0				
Change Period (Y+Rc), s		5.0			3.5	5.0		5.0				
Max Green Setting (Gmax), s		34.0			6.3	24.2		16.0				
Max Q Clear Time (g_c+I1), s		16.9			4.9	3.1		17.4				
Green Ext Time (p_c), s		10.5			0.0	12.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			20.2									
HCM 2010 LOS			C									
Notes												

Timings
3: E St. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

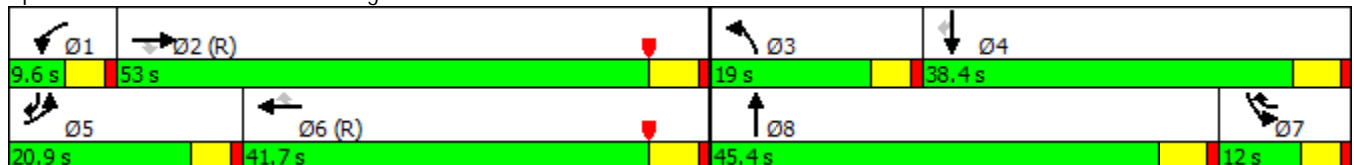


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑	↗	↔↔	↑↑	↗	↗	↑↑	↔↔	↑↑	↗
Traffic Volume (vph)	221	1242	474	60	348	63	167	173	43	129	43
Future Volume (vph)	221	1242	474	60	348	63	167	173	43	129	43
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8	7	4	5
Permitted Phases			2			6					4
Detector Phase	5	2	2	1	6	7	3	8	7	4	5
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0
Minimum Split (s)	9.6	39.4	39.4	9.6	39.4	9.6	9.6	38.4	9.6	38.4	9.6
Total Split (s)	20.9	53.0	53.0	9.6	41.7	12.0	19.0	45.4	12.0	38.4	20.9
Total Split (%)	17.4%	44.2%	44.2%	8.0%	34.8%	10.0%	15.8%	37.8%	10.0%	32.0%	17.4%
Yellow Time (s)	3.6	4.4	4.4	3.6	4.4	3.6	3.6	4.4	3.6	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4	4.6	5.4	4.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	Max	None	Max	None
Act Effct Green (s)	13.4	49.5	49.5	5.0	39.2	46.9	14.4	42.4	6.9	33.0	51.8
Actuated g/C Ratio	0.11	0.41	0.41	0.04	0.33	0.39	0.12	0.35	0.06	0.28	0.43
v/c Ratio	0.70	0.95	0.55	0.51	0.34	0.09	0.93	0.24	0.27	0.15	0.06
Control Delay	55.5	45.7	10.8	74.8	34.1	4.3	100.6	17.2	57.5	33.4	3.0
Queue Delay	0.0	22.3	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.5	68.0	11.3	74.8	34.1	4.3	100.6	17.2	57.5	33.4	3.0
LOS	E	E	B	E	C	A	F	B	E	C	A
Approach Delay		52.7			35.3			47.8		32.2	
Approach LOS		D			D			D		C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 92 (77%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.95
 Intersection Signal Delay: 47.9
 Intersection LOS: D
 Intersection Capacity Utilization 88.7%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 3: E St. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis

3: E St. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	221	1242	474	60	348	63	167	173	116	43	129	43
Future Volume (vph)	221	1242	474	60	348	63	167	173	116	43	129	43
Ideal Flow (vphp)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Total Lost time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95		0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3200	3600	1800	3200	3600	1800	1700	3600		3200	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3200	3600	1800	3200	3600	1800	1700	3600		3200	3600	1800
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	251	1411	539	68	395	72	190	197	132	49	147	49
RTOR Reduction (vph)	0	0	239	0	0	45	0	85	0	0	0	30
Lane Group Flow (vph)	251	1411	300	68	395	27	190	244	0	49	147	19
Confl. Peds. (#/hr)									2			
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	13.4	47.7	47.7	4.0	38.3	44.2	14.4	42.4		5.9	33.9	47.3
Effective Green, g (s)	13.4	47.7	47.7	4.0	38.3	44.2	14.4	42.4		5.9	33.9	47.3
Actuated g/C Ratio	0.11	0.40	0.40	0.03	0.32	0.37	0.12	0.35		0.05	0.28	0.39
Clearance Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	2.0	2.0	3.0		2.0	3.0	2.0
Lane Grp Cap (vph)	357	1431	715	106	1149	663	204	1272		157	1017	709
v/s Ratio Prot	c0.08	c0.39		0.02	0.11	0.00	c0.11	c0.07		c0.02	0.04	0.00
v/s Ratio Perm			0.17			0.01						0.01
v/c Ratio	0.70	0.99	0.42	0.64	0.34	0.04	0.93	0.19		0.31	0.14	0.03
Uniform Delay, d1	51.4	35.8	26.1	57.3	31.2	24.3	52.3	26.9		55.1	32.2	22.3
Progression Factor	0.94	1.02	1.32	1.10	1.07	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.3	16.2	1.2	9.0	0.8	0.0	43.5	0.3		0.4	0.3	0.0
Delay (s)	51.8	52.6	35.8	71.8	34.1	24.3	95.8	27.2		55.5	32.5	22.3
Level of Service	D	D	D	E	C	C	F	C		E	C	C
Approach Delay (s)		48.4			37.6			52.3			35.1	
Approach LOS		D			D			D			D	

Intersection Summary		
HCM 2000 Control Delay	46.4	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.72	D
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	88.7%	20.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	221	1242	474	60	348	63	167	173	116	43	129	43
Future Volume (veh/h)	221	1242	474	60	348	63	167	173	116	43	129	43
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	251	1411	288	68	395	41	190	197	100	49	147	27
Adj No. of Lanes	2	2	1	2	2	1	1	2	0	2	2	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	296	1371	614	110	1157	602	183	743	362	163	940	574
Arrive On Green	0.20	0.80	0.80	0.07	0.68	0.68	0.12	0.33	0.33	0.05	0.28	0.28
Sat Flow, veh/h	2956	3420	1530	2956	3420	1530	1524	2229	1087	2956	3420	1530
Grp Volume(v), veh/h	251	1411	288	68	395	41	190	149	148	49	147	27
Grp Sat Flow(s),veh/h/ln	1478	1710	1530	1478	1710	1530	1524	1710	1606	1478	1710	1530
Q Serve(g_s), s	9.8	48.1	7.2	2.7	5.8	0.2	14.4	7.6	8.1	1.9	3.9	1.3
Cycle Q Clear(g_c), s	9.8	48.1	7.2	2.7	5.8	0.2	14.4	7.6	8.1	1.9	3.9	1.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.68	1.00		1.00
Lane Grp Cap(c), veh/h	296	1371	614	110	1157	602	183	570	535	163	941	574
V/C Ratio(X)	0.85	1.03	0.47	0.62	0.34	0.07	1.04	0.26	0.28	0.30	0.16	0.05
Avail Cap(c_a), veh/h	402	1371	614	123	1157	602	183	570	535	182	941	574
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.59	0.59	0.59	0.94	0.94	0.94	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.1	11.9	7.8	54.7	13.8	4.8	52.8	29.2	29.4	54.5	33.0	23.9
Incr Delay (d2), s/veh	5.7	26.5	1.5	4.2	0.8	0.2	77.2	1.1	1.3	0.4	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	26.0	3.1	1.2	2.9	0.3	10.0	3.8	3.8	0.8	1.9	0.6
LnGrp Delay(d),s/veh	52.8	38.4	9.3	58.9	14.5	5.0	130.1	30.3	30.6	54.9	33.3	24.0
LnGrp LOS	D	F	A	E	B	A	F	C	C	D	C	C
Approach Vol, veh/h		1950			504			487			223	
Approach Delay, s/veh		35.9			19.8			69.4			36.9	
Approach LOS		D			B			E			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.1	53.5	19.0	38.4	16.6	46.0	12.0	45.4				
Change Period (Y+Rc), s	4.6	5.4	4.6	5.4	4.6	5.4	5.4	* 5.4				
Max Green Setting (Gmax), s	5.0	47.6	14.4	33.0	16.3	36.3	7.4	* 40				
Max Q Clear Time (g_c+I1), s	4.7	50.1	16.4	5.9	11.8	7.8	3.9	10.1				
Green Ext Time (p_c), s	0.0	0.0	0.0	1.0	0.2	21.8	0.3	1.7				
Intersection Summary												
HCM 2010 Ctrl Delay			38.6									
HCM 2010 LOS			D									
Notes												

Timings
4: Arrowhead Av. & Orange Show Rd.

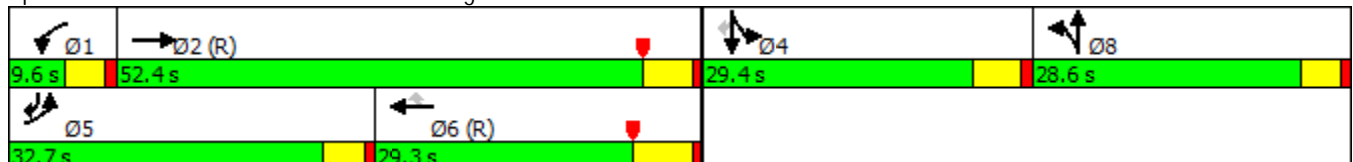


Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	294	1013	7	298	87	3	89	11	197
Future Volume (vph)	294	1013	7	298	87	3	89	11	197
Turn Type	Prot	NA	Prot	NA	Perm	NA	Split	NA	pm+ov
Protected Phases	5	2	1	6		8	4	4	5
Permitted Phases					6				4
Detector Phase	5	2	1	6	6	8	4	4	5
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	28.4	9.6	29.2	29.2	28.6	29.4	29.4	9.6
Total Split (s)	32.7	52.4	9.6	29.3	29.3	28.6	29.4	29.4	32.7
Total Split (%)	27.3%	43.7%	8.0%	24.4%	24.4%	23.8%	24.5%	24.5%	27.3%
Yellow Time (s)	3.6	4.4	3.6	5.2	5.2	3.6	4.4	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	6.2	6.2	4.6	5.4	5.4	4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag				Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				Yes
Recall Mode	None	C-Max	None	C-Max	C-Max	Max	Max	Max	None
Act Effect Green (s)	26.0	54.7	5.0	25.2	25.2	24.0	24.0	24.0	50.8
Actuated g/C Ratio	0.22	0.46	0.04	0.21	0.21	0.20	0.20	0.20	0.42
v/c Ratio	0.91	0.71	0.11	0.45	0.20	0.02	0.17	0.16	0.25
Control Delay	83.7	34.5	59.0	44.2	2.7	26.6	41.4	41.1	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.7	34.5	59.0	44.2	2.7	26.6	41.4	41.1	2.0
LOS	F	C	E	D	A	C	D	D	A
Approach Delay		45.4		35.2		26.6		15.2	
Approach LOS		D		D		C		B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 86 (72%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 38.9
 Intersection LOS: D
 Intersection Capacity Utilization 67.2%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 4: Arrowhead Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
4: Arrowhead Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



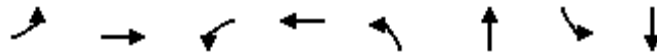
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	294	1013	18	7	298	87	0	3	5	89	11	197
Future Volume (vph)	294	1013	18	7	298	87	0	3	5	89	11	197
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	6.2	6.2		4.6		5.4	5.4	4.6
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00		0.99		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00		0.95	0.96	1.00
Satd. Flow (prot)	1700	3600		1700	3600	1800		1800		1700	1800	1800
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00		0.95	0.96	1.00
Satd. Flow (perm)	1700	3600		1700	3600	1800		1800		1700	1800	1800
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	334	1151	20	8	339	99	0	3	6	101	12	224
RTOR Reduction (vph)	0	1	0	0	0	78	0	5	0	0	0	131
Lane Group Flow (vph)	334	1170	0	8	339	21	0	4	0	57	57	93
Confl. Peds. (#/hr)									6			7
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		8	8		4	4	5
Permitted Phases						6						4
Actuated Green, G (s)	26.0	51.0		1.0	25.2	25.2		24.0		24.0	24.0	50.0
Effective Green, g (s)	26.0	51.0		1.0	25.2	25.2		24.0		24.0	24.0	50.0
Actuated g/C Ratio	0.22	0.42		0.01	0.21	0.21		0.20		0.20	0.20	0.42
Clearance Time (s)	4.6	5.4		4.6	6.2	6.2		4.6		5.4	5.4	4.6
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0		3.0		3.0	3.0	2.0
Lane Grp Cap (vph)	368	1530		14	756	378		360		340	360	750
v/s Ratio Prot	c0.20	c0.32		0.00	0.09			c0.00		c0.03	0.03	0.03
v/s Ratio Perm						0.01						0.02
v/c Ratio	0.91	0.76		0.57	0.45	0.06		0.01		0.17	0.16	0.12
Uniform Delay, d1	45.8	29.4		59.3	41.3	37.9		38.5		39.7	39.7	21.5
Progression Factor	1.49	1.22		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	13.8	1.8		30.5	1.9	0.3		0.1		1.1	0.9	0.0
Delay (s)	82.2	37.6		89.8	43.3	38.2		38.5		40.8	40.6	21.6
Level of Service	F	D		F	D	D		D		D	D	C
Approach Delay (s)		47.5			43.0			38.5			28.0	
Approach LOS		D			D			D			C	

Intersection Summary		
HCM 2000 Control Delay	43.7	HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio	0.50	
Actuated Cycle Length (s)	120.0	Sum of lost time (s) 20.8
Intersection Capacity Utilization	67.2%	ICU Level of Service C
Analysis Period (min)	15	
c Critical Lane Group		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	294	1013	18	7	298	87	0	3	5	89	11	197
Future Volume (veh/h)	294	1013	18	7	298	87	0	3	5	89	11	197
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	334	1151	19	8	339	79	0	3	6	110	0	130
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	355	1435	24	16	710	318	324	107	213	648	0	638
Arrive On Green	0.29	0.55	0.55	0.01	0.21	0.21	0.00	0.20	0.20	0.20	0.00	0.20
Sat Flow, veh/h	1619	3443	57	1619	3420	1530	1619	533	1067	3238	0	1514
Grp Volume(v), veh/h	334	572	598	8	339	79	0	0	9	110	0	130
Grp Sat Flow(s),veh/h/ln	1619	1710	1790	1619	1710	1530	1619	0	1600	1619	0	1514
Q Serve(g_s), s	24.2	32.2	32.2	0.6	10.5	5.2	0.0	0.0	0.5	3.4	0.0	6.5
Cycle Q Clear(g_c), s	24.2	32.2	32.2	0.6	10.5	5.2	0.0	0.0	0.5	3.4	0.0	6.5
Prop In Lane	1.00		0.03	1.00		1.00	1.00		0.67	1.00		1.00
Lane Grp Cap(c), veh/h	355	713	746	16	710	318	324	0	320	648	0	638
V/C Ratio(X)	0.94	0.80	0.80	0.51	0.48	0.25	0.00	0.00	0.03	0.17	0.00	0.20
Avail Cap(c_a), veh/h	379	713	746	67	710	318	324	0	320	648	0	638
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.26	0.26	0.26	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.8	22.8	22.8	59.1	41.8	39.7	0.0	0.0	38.6	39.8	0.0	22.1
Incr Delay (d2), s/veh	11.5	2.6	2.5	9.0	2.3	1.9	0.0	0.0	0.2	0.6	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.9	15.5	16.3	0.3	5.2	2.4	0.0	0.0	0.3	1.6	0.0	2.9
LnGrp Delay(d),s/veh	53.2	25.3	25.2	68.2	44.1	41.6	0.0	0.0	38.8	40.3	0.0	22.9
LnGrp LOS	D	C	C	E	D	D			D	D		C
Approach Vol, veh/h		1504			426			9			240	
Approach Delay, s/veh		31.5			44.1			38.8			30.9	
Approach LOS		C			D			D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.8	56.2		29.4	30.9	31.1		28.6				
Change Period (Y+Rc), s	4.6	* 6.2		5.4	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.0	* 47		24.0	28.1	23.1		24.0				
Max Q Clear Time (g_c+I1), s	2.6	34.2		8.5	26.2	12.5		2.5				
Green Ext Time (p_c), s	0.0	9.2		0.7	0.1	7.9		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			33.9									
HCM 2010 LOS			C									
Notes												

Timings

5: Washington Av./Washington Av. & Orange Show Rd.

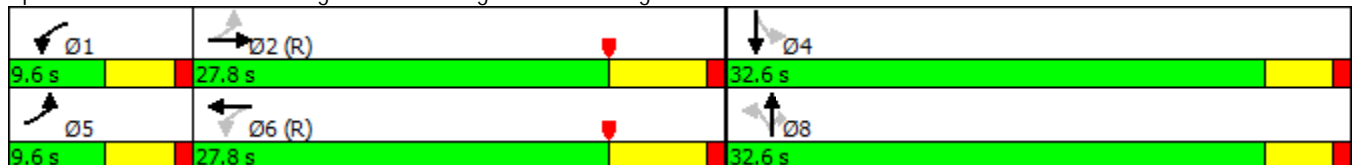


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↙	↕	↙	↕		↕		↕
Traffic Volume (vph)	50	1053	2	382	6	3	3	1
Future Volume (vph)	50	1053	2	382	6	3	3	1
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	9.6	23.2	32.6	32.6	32.6	32.6
Total Split (s)	9.6	27.8	9.6	27.8	32.6	32.6	32.6	32.6
Total Split (%)	13.7%	39.7%	13.7%	39.7%	46.6%	46.6%	46.6%	46.6%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effect Green (s)	62.6	60.3	62.6	54.0		13.6		13.6
Actuated g/C Ratio	0.89	0.86	0.89	0.77		0.19		0.19
v/c Ratio	0.04	0.37	0.00	0.15		0.03		0.03
Control Delay	4.6	8.6	6.0	6.8		18.8		12.6
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	4.6	8.6	6.0	6.8		18.8		12.6
LOS	A	A	A	A		B		B
Approach Delay		8.4		6.8		18.8		12.6
Approach LOS		A		A		B		B

Intersection Summary

Cycle Length: 70
 Actuated Cycle Length: 70
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.37
 Intersection Signal Delay: 8.1
 Intersection LOS: A
 Intersection Capacity Utilization 56.3%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 5: Washington Av./Washington Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 5: Washington Av./Washington Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↖	↗		↗	↖
Traffic Volume (vph)	50	1053	8	2	382	12	6	3	0	3	1	7
Future Volume (vph)	50	1053	8	2	382	12	6	3	0	3	1	7
Ideal Flow (vphp)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2		4.6	6.2			4.6			4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			1.00			0.91	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.99	
Satd. Flow (prot)	1700	3600		1700	3600			1800			1800	
Flt Permitted	0.48	1.00		0.23	1.00			0.79			0.92	
Satd. Flow (perm)	1700	3600		1700	3600			1800			1800	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	54	1132	9	2	411	13	6	3	0	3	1	8
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	7	0
Lane Group Flow (vph)	54	1141	0	2	422	0	0	9	0	0	5	0
Confl. Peds. (#/hr)			1									
Confl. Bikes (#/hr)			1			1						
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)	51.0	48.0		47.0	46.0			5.6			5.6	
Effective Green, g (s)	51.0	48.0		47.0	46.0			5.6			5.6	
Actuated g/C Ratio	0.73	0.69		0.67	0.66			0.08			0.08	
Clearance Time (s)	4.6	6.2		4.6	6.2			4.6			4.6	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	1238	2468		1141	2365			144			144	
v/s Ratio Prot	c0.00	c0.32		0.00	0.12							
v/s Ratio Perm	0.03			0.00				0.01			0.00	
v/c Ratio	0.04	0.46		0.00	0.18			0.06			0.03	
Uniform Delay, d1	2.7	5.1		3.8	4.7			29.8			29.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	0.6		0.0	0.2			0.2			0.1	
Delay (s)	2.7	5.7		3.8	4.8			30.0			29.8	
Level of Service	A	A		A	A			C			C	
Approach Delay (s)		5.6			4.8			30.0			29.8	
Approach LOS		A			A			C			C	

Intersection Summary		
HCM 2000 Control Delay	5.7	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.42	A
Actuated Cycle Length (s)	70.0	Sum of lost time (s)
Intersection Capacity Utilization	56.3%	15.4
Analysis Period (min)	15	ICU Level of Service
		B

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	1053	8	2	382	12	6	3	0	3	1	7
Future Volume (veh/h)	50	1053	8	2	382	12	6	3	0	3	1	7
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	54	1132	9	2	411	13	6	3	0	3	1	0
Adj No. of Lanes	1	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	788	2591	21	402	2373	75	119	17	49	127	12	0
Arrive On Green	0.05	0.75	0.75	0.00	0.70	0.70	0.03	0.03	0.00	0.03	0.03	0.00
Sat Flow, veh/h	1619	3477	28	1619	3382	107	1037	519	1530	1163	388	0
Grp Volume(v), veh/h	54	557	584	2	207	217	9	0	0	4	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1794	1619	1710	1779	1556	0	1530	1550	0	0
Q Serve(g_s), s	0.6	8.6	8.6	0.0	2.9	2.9	0.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.6	8.6	8.6	0.0	2.9	2.9	0.4	0.0	0.0	0.2	0.0	0.0
Prop In Lane	1.00		0.02	1.00		0.06	0.67		1.00	0.75		0.00
Lane Grp Cap(c), veh/h	788	1275	1338	402	1200	1248	135	0	49	139	0	0
V/C Ratio(X)	0.07	0.44	0.44	0.00	0.17	0.17	0.07	0.00	0.00	0.03	0.00	0.00
Avail Cap(c_a), veh/h	829	1275	1338	513	1200	1248	703	0	612	696	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.86	0.86	0.86	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	2.3	3.4	3.4	3.3	3.5	3.5	33.0	0.0	0.0	32.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.1	1.0	0.0	0.3	0.3	0.2	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	4.4	4.6	0.0	1.4	1.5	0.2	0.0	0.0	0.1	0.0	0.0
LnGrp Delay(d),s/veh	2.3	4.5	4.4	3.3	3.8	3.8	33.2	0.0	0.0	33.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C			C		
Approach Vol, veh/h		1195			426			9			4	
Approach Delay, s/veh		4.3			3.8			33.2			33.0	
Approach LOS		A			A			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.8	58.4		6.8	7.9	55.3		6.8				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.0	21.6		28.0	5.0	21.6		28.0				
Max Q Clear Time (g_c+I1), s	2.0	10.6		2.2	2.6	4.9		2.4				
Green Ext Time (p_c), s	0.0	7.9		0.0	0.0	10.8		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			4.4									
HCM 2010 LOS			A									

Intersection												
Int Delay, s/veh	5.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↔	
Traffic Vol, veh/h	0	0	0	0	0	8	0	0	0	12	0	0
Future Vol, veh/h	0	0	0	0	0	8	0	0	0	12	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	70	70	70	70	70	70	70	70	70	70	70
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	11	0	0	0	17	0	0

Major/Minor	Major1			Major2			Minor2				
Conflicting Flow All	11	0	-	-	-	0	-	-	6	6	6
Stage 1	-	-	-	-	-	-	-	-	6	6	-
Stage 2	-	-	-	-	-	-	-	-	0	0	-
Critical Hdwy	4.1	-	-	-	-	-	-	-	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	-	-	-	-	-	3.5	4	3.3
Pot Cap-1 Maneuver	1621	-	0	0	-	-	-	-	1019	893	1083
Stage 1	-	-	0	0	-	-	-	-	1021	895	-
Stage 2	-	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1621	-	-	-	-	-	-	-	1019	893	1083
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	1019	893	-
Stage 1	-	-	-	-	-	-	-	-	1021	895	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1621	-	-	-	1019
HCM Lane V/C Ratio	-	-	-	-	0.017
HCM Control Delay (s)	0	-	-	-	8.6
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Timings

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.

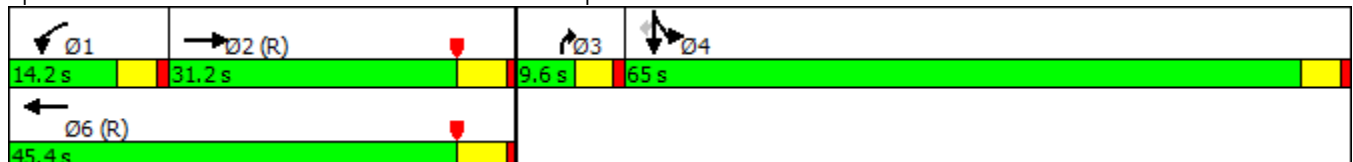


Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↖	↑↑	↗	↖	↗	↗
Traffic Volume (vph)	464	36	423	23	597	313	633
Future Volume (vph)	464	36	423	23	597	313	633
Turn Type	NA	Prot	NA	Prot	Split	NA	Perm
Protected Phases	2	1	6	3	4	4	
Permitted Phases							4
Detector Phase	2	1	6	3	4	4	4
Switch Phase							
Minimum Initial (s)	10.0	5.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	22.4	9.6	15.4	9.5	14.6	14.6	14.6
Total Split (s)	31.2	14.2	45.4	9.6	65.0	65.0	65.0
Total Split (%)	26.0%	11.8%	37.8%	8.0%	54.2%	54.2%	54.2%
Yellow Time (s)	4.4	3.6	4.4	3.5	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	4.6	5.4	4.5	4.6	4.6	4.6
Lead/Lag	Lag	Lead		Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes
Recall Mode	C-Max	None	C-Max	None	Max	Max	Max
Act Effect Green (s)	32.2	7.2	40.0	5.1	64.2	64.2	64.2
Actuated g/C Ratio	0.27	0.06	0.33	0.04	0.54	0.54	0.54
v/c Ratio	0.56	0.38	0.38	0.08	0.54	0.52	0.63
Control Delay	41.4	64.3	31.7	0.5	21.8	21.3	14.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.4	64.3	31.7	0.5	21.8	21.3	14.0
LOS	D	E	C	A	C	C	B
Approach Delay	41.4		34.3			18.4	
Approach LOS	D		C			B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.63
 Intersection Signal Delay: 25.7
 Intersection LOS: C
 Intersection Capacity Utilization 62.0%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.



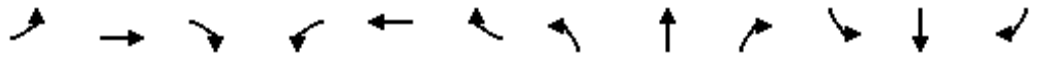
HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑				↗	↖	↑↑	↗
Traffic Volume (vph)	0	464	32	36	423	0	0	0	23	597	313	633
Future Volume (vph)	0	464	32	36	423	0	0	0	23	597	313	633
Ideal Flow (vphpl)	1800	1800	1800	1700	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Lane Util. Factor		0.95		1.00	0.95				1.00	0.95	0.95	1.00
Frbp, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Frt		0.99		1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00				1.00	0.95	0.98	1.00
Satd. Flow (prot)		3600		1700	3600				1800	1700	1800	1800
Flt Permitted		1.00		0.95	1.00				1.00	0.95	0.98	1.00
Satd. Flow (perm)		3600		1700	3600				1800	1700	1800	1800
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	504	35	39	460	0	0	0	25	649	340	688
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	24	0	0	136
Lane Group Flow (vph)	0	535	0	39	460	0	0	0	1	487	502	552
Confl. Peds. (#/hr)			6			1						
Confl. Bikes (#/hr)						2						
Turn Type		NA		Prot	NA				Prot	Split	NA	Perm
Protected Phases		2		1	6				3	4	4	
Permitted Phases												4
Actuated Green, G (s)		28.6		5.0	38.2				3.1	64.2	64.2	64.2
Effective Green, g (s)		28.6		5.0	38.2				3.1	64.2	64.2	64.2
Actuated g/C Ratio		0.24		0.04	0.32				0.03	0.54	0.54	0.54
Clearance Time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Vehicle Extension (s)		3.0		2.0	3.0				3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		858		70	1146				46	909	963	963
v/s Ratio Prot		c0.15		0.02	c0.13				c0.00	0.29	0.28	
v/s Ratio Perm												c0.31
v/c Ratio		0.62		0.56	0.40				0.01	0.54	0.52	0.57
Uniform Delay, d1		40.9		56.4	32.0				57.0	18.2	18.0	18.7
Progression Factor		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		3.4		5.4	1.0				0.1	2.3	2.0	2.5
Delay (s)		44.3		61.8	33.0				57.1	20.4	20.0	21.2
Level of Service		D		E	C				E	C	C	C
Approach Delay (s)		44.3			35.3			57.1			20.6	
Approach LOS		D			D			E			C	

Intersection Summary			
HCM 2000 Control Delay	28.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.1
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑				↗	↖	↑	↗
Traffic Volume (veh/h)	0	464	32	36	423	0	0	0	23	597	313	633
Future Volume (veh/h)	0	464	32	36	423	0	0	0	23	597	313	633
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	0	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	504	24	39	460	0	0	0	12	494	556	686
Adj No. of Lanes	0	2	0	1	2	0	0	0	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1145	54	49	1414	0	0	0	0	815	906	770
Arrive On Green	0.00	0.34	0.34	0.03	0.41	0.00	0.00	0.00	0.00	0.50	0.50	0.50
Sat Flow, veh/h	0	3413	158	1619	3510	0		0		1619	1800	1530
Grp Volume(v), veh/h	0	259	269	39	460	0		0.0		494	556	686
Grp Sat Flow(s),veh/h/ln	0	1710	1770	1619	1710	0				1619	1800	1530
Q Serve(g_s), s	0.0	14.0	14.1	2.9	10.9	0.0				26.2	26.6	48.4
Cycle Q Clear(g_c), s	0.0	14.0	14.1	2.9	10.9	0.0				26.2	26.6	48.4
Prop In Lane	0.00		0.09	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	589	610	49	1414	0				815	906	770
V/C Ratio(X)	0.00	0.44	0.44	0.79	0.33	0.00				0.61	0.61	0.89
Avail Cap(c_a), veh/h	0	589	610	130	1414	0				815	906	770
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.77	0.77	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	30.4	30.4	57.8	23.9	0.0				21.3	21.4	26.8
Incr Delay (d2), s/veh	0.0	2.4	2.3	8.0	0.5	0.0				3.3	3.1	14.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.0	7.3	1.4	5.3	0.0				12.4	13.9	23.5
LnGrp Delay(d),s/veh	0.0	32.7	32.7	65.8	24.3	0.0				24.6	24.5	41.5
LnGrp LOS		C	C	E	C					C	C	D
Approach Vol, veh/h		528			499						1736	
Approach Delay, s/veh		32.7			27.6						31.3	
Approach LOS		C			C						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	8.2	46.8		65.0		55.0						
Change Period (Y+Rc), s	4.6	5.4		4.6		5.4						
Max Green Setting (Gmax), s	9.6	25.8		60.4		40.0						
Max Q Clear Time (g_c+I1), s	4.9	16.1		50.4		12.9						
Green Ext Time (p_c), s	0.0	4.0		5.5		6.4						
Intersection Summary												
HCM 2010 Ctrl Delay				30.9								
HCM 2010 LOS				C								
Notes												

Timings

Gateway South Building 4 TIA (JN 10187)

9: Waterman Av. & Orange Show Rd./Orange Show Rd.

3/27/2017

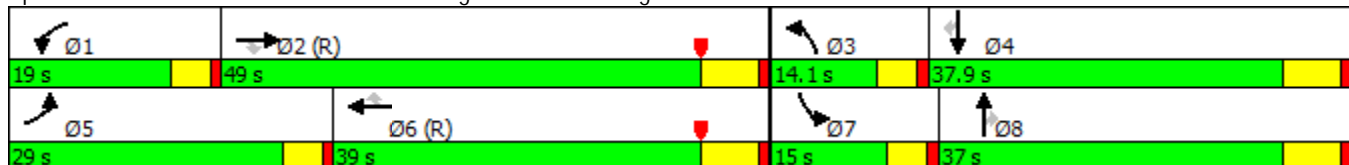


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	174	534	334	97	282	86	56	483	64	74	581	66
Future Volume (vph)	174	534	334	97	282	86	56	483	64	74	581	66
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.2	35.2	9.6	35.2	35.2	9.6	33.2	33.2	9.6	33.2	33.2
Total Split (s)	29.0	49.0	49.0	19.0	39.0	39.0	14.1	37.0	37.0	15.0	37.9	37.9
Total Split (%)	24.2%	40.8%	40.8%	15.8%	32.5%	32.5%	11.8%	30.8%	30.8%	12.5%	31.6%	31.6%
Yellow Time (s)	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Act Effect Green (s)	18.3	45.5	45.5	11.7	38.9	38.9	8.1	32.0	32.0	9.2	35.0	35.0
Actuated g/C Ratio	0.15	0.38	0.38	0.10	0.32	0.32	0.07	0.27	0.27	0.08	0.29	0.29
v/c Ratio	0.78	0.45	0.45	0.68	0.56	0.15	0.57	0.58	0.12	0.67	0.64	0.12
Control Delay	68.4	29.8	9.0	72.6	39.4	1.4	73.3	41.5	0.4	77.7	41.4	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.4	29.8	9.0	72.6	39.4	1.4	73.3	41.5	0.4	77.7	41.4	0.4
LOS	E	C	A	E	D	A	E	D	A	E	D	A
Approach Delay		29.6			39.3			40.1			41.3	
Approach LOS		C			D			D			D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 36.4
 Intersection LOS: D
 Intersection Capacity Utilization 65.6%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	174	534	334	97	282	86	56	483	64	74	581	66
Future Volume (vph)	174	534	334	97	282	86	56	483	64	74	581	66
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	202	621	388	113	328	100	65	562	74	86	676	77
RTOR Reduction (vph)	0	0	185	0	0	68	0	0	54	0	0	55
Lane Group Flow (vph)	202	621	203	113	328	32	65	562	20	86	676	22
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	18.3	44.6	44.6	11.7	38.0	38.0	7.1	32.9	32.9	9.2	35.0	35.0
Effective Green, g (s)	18.3	44.6	44.6	11.7	38.0	38.0	7.1	32.9	32.9	9.2	35.0	35.0
Actuated g/C Ratio	0.15	0.37	0.37	0.10	0.32	0.32	0.06	0.27	0.27	0.08	0.29	0.29
Clearance Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	259	1338	669	165	570	570	100	987	493	130	1050	525
v/s Ratio Prot	c0.12	0.17		0.07	c0.18		0.04	0.16		c0.05	c0.19	
v/s Ratio Perm			0.11			0.02			0.01			0.01
v/c Ratio	0.78	0.46	0.30	0.68	0.58	0.06	0.65	0.57	0.04	0.66	0.64	0.04
Uniform Delay, d1	48.9	28.6	26.7	52.4	34.3	28.5	55.2	37.5	32.0	53.9	37.1	30.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.7	1.2	1.2	9.0	4.2	0.2	10.9	2.4	0.2	9.4	3.0	0.2
Delay (s)	61.6	29.8	27.9	61.4	38.4	28.7	66.2	39.8	32.1	63.3	40.1	30.6
Level of Service	E	C	C	E	D	C	E	D	C	E	D	C
Approach Delay (s)		34.5			41.4			41.5			41.6	
Approach LOS		C			D			D			D	

Intersection Summary

HCM 2000 Control Delay	38.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	174	534	334	97	282	86	56	483	64	74	581	66
Future Volume (veh/h)	174	534	334	97	282	86	56	483	64	74	581	66
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	202	621	289	113	328	59	65	562	38	86	676	54
Adj No. of Lanes	1	2	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	227	1417	634	136	644	547	81	878	393	106	930	416
Arrive On Green	0.14	0.41	0.41	0.08	0.36	0.36	0.05	0.26	0.26	0.07	0.27	0.27
Sat Flow, veh/h	1619	3420	1530	1619	1800	1530	1619	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	202	621	289	113	328	59	65	562	38	86	676	54
Grp Sat Flow(s),veh/h/ln	1619	1710	1530	1619	1800	1530	1619	1710	1530	1619	1710	1530
Q Serve(g_s), s	14.7	15.6	16.4	8.2	17.2	3.1	4.8	17.5	2.3	6.3	21.5	3.2
Cycle Q Clear(g_c), s	14.7	15.6	16.4	8.2	17.2	3.1	4.8	17.5	2.3	6.3	21.5	3.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	227	1417	634	136	644	547	81	878	393	106	930	416
V/C Ratio(X)	0.89	0.44	0.46	0.83	0.51	0.11	0.80	0.64	0.10	0.81	0.73	0.13
Avail Cap(c_a), veh/h	329	1417	634	194	644	547	128	878	393	140	930	416
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.94	0.94	0.94	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.7	25.2	25.4	54.1	30.3	25.7	56.4	39.7	34.0	55.4	39.6	33.0
Incr Delay (d2), s/veh	13.5	0.9	2.2	13.0	2.9	0.4	7.8	3.6	0.5	17.7	5.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.4	7.5	7.3	4.2	9.1	1.4	2.3	8.7	1.0	3.3	10.8	1.4
LnGrp Delay(d),s/veh	64.2	26.1	27.6	67.2	33.1	26.1	64.2	43.2	34.5	73.0	44.6	33.6
LnGrp LOS	E	C	C	E	C	C	E	D	C	E	D	C
Approach Vol, veh/h		1112			500			665			816	
Approach Delay, s/veh		33.4			40.0			44.8			46.9	
Approach LOS		C			D			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.7	55.9	10.6	38.8	21.4	49.1	12.4	37.0				
Change Period (Y+Rc), s	4.6	6.2	4.6	6.2	4.6	6.2	4.6	6.2				
Max Green Setting (Gmax), s	14.4	42.8	9.5	31.7	24.4	32.8	10.4	30.8				
Max Q Clear Time (g_c+I1), s	10.2	18.4	6.8	23.5	16.7	19.2	8.3	19.5				
Green Ext Time (p_c), s	0.0	10.5	0.0	4.6	0.2	7.5	0.0	5.7				
Intersection Summary												
HCM 2010 Ctrl Delay			40.5									
HCM 2010 LOS			D									

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↕	↕
Traffic Vol, veh/h	3	10	1	599	1052	8
Future Vol, veh/h	3	10	1	599	1052	8
Conflicting Peds, #/hr	0	0	0	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	75	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	4	13	1	749	1315	10

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1699	665	1327 0
Stage 1	1322	-	- -
Stage 2	377	-	- -
Critical Hdwy	6.8	6.9	4.1 -
Critical Hdwy Stg 1	5.8	-	- -
Critical Hdwy Stg 2	5.8	-	- -
Follow-up Hdwy	3.5	3.3	2.2 -
Pot Cap-1 Maneuver	*85	*645	837 -
Stage 1	*504	-	- -
Stage 2	*839	-	- -
Platoon blocked, %		1	1 -
Mov Cap-1 Maneuver	*85	*644	837 -
Mov Cap-2 Maneuver	*323	-	- -
Stage 1	*503	-	- -
Stage 2	*837	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	12	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	837	-	323	644	-	-
HCM Lane V/C Ratio	0.001	-	0.012	0.019	-	-
HCM Control Delay (s)	9.3	-	16.3	10.7	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0	0.1	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Timings
11: Waterman Av. & Driveway 2/Park Center Dr.



Lane Group	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	Ø4
Lane Configurations		↖	↗	↖	↗	↗	↖	↗	
Traffic Volume (vph)	20	1	7	21	651	122	45	801	
Future Volume (vph)	20	1	7	21	651	122	45	801	
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		8		5	2		1	6	4
Permitted Phases	8		8	2		2	6		
Detector Phase	8	8	8	5	2	2	1	6	
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	21.6	21.6	21.6	9.6	23.2	23.2	9.6	33.2	14.6
Total Split (s)	21.6	21.6	21.6	9.6	32.0	32.0	11.4	33.8	21.6
Total Split (%)	33.2%	33.2%	33.2%	14.8%	49.2%	49.2%	17.5%	52.0%	33%
Yellow Time (s)	3.6	3.6	3.6	3.6	5.2	5.2	3.6	5.2	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Lead/Lag				Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max	None
Act Effect Green (s)		11.4	11.4	50.0	47.9	47.9	54.5	51.4	
Actuated g/C Ratio		0.18	0.18	0.77	0.74	0.74	0.84	0.79	
v/c Ratio		0.08	0.02	0.06	0.30	0.11	0.04	0.35	
Control Delay		21.7	0.1	4.1	7.5	2.6	3.4	7.0	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		21.7	0.1	4.1	7.5	2.6	3.4	7.0	
LOS		C	A	A	A	A	A	A	
Approach Delay		16.1			6.6			6.8	
Approach LOS		B			A			A	

Intersection Summary

Cycle Length: 65
 Actuated Cycle Length: 65
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.35
 Intersection Signal Delay: 6.9
 Intersection Capacity Utilization 48.9%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 11: Waterman Av. & Driveway 2/Park Center Dr.



HCM Signalized Intersection Capacity Analysis
 11: Waterman Av. & Driveway 2/Park Center Dr.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↕	↕	↕	↕↕	
Traffic Volume (vph)	0	0	0	20	1	7	21	651	122	45	801	5
Future Volume (vph)	0	0	0	20	1	7	21	651	122	45	801	5
Ideal Flow (vphp)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)					4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor					1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes					1.00	1.00	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes					1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt					1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected					0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)					1800	1800	1615	3600	1800	1700	3600	
Flt Permitted					0.73	1.00	0.28	1.00	1.00	0.33	1.00	
Satd. Flow (perm)					1800	1800	469	3600	1800	1700	3600	
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	0	0	0	25	1	9	26	804	151	56	989	6
RTOR Reduction (vph)	0	0	0	0	0	8	0	0	56	0	0	0
Lane Group Flow (vph)	0	0	0	0	26	1	26	804	95	56	995	0
Confl. Bikes (#/hr)									2			2
Turn Type				Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1		6
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)					5.4	5.4	42.8	40.8	40.8	45.6	42.2	
Effective Green, g (s)					5.4	5.4	42.8	40.8	40.8	45.6	42.2	
Actuated g/C Ratio					0.08	0.08	0.66	0.63	0.63	0.70	0.65	
Clearance Time (s)					4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Vehicle Extension (s)					3.0	3.0	2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)					149	149	344	2259	1129	1192	2337	
v/s Ratio Prot							0.00	0.22		c0.00	c0.28	
v/s Ratio Perm					0.01	0.00	0.05		0.05	0.03		
v/c Ratio					0.17	0.01	0.08	0.36	0.08	0.05	0.43	
Uniform Delay, d1					27.7	27.3	3.9	5.8	4.8	3.0	5.5	
Progression Factor					1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2					0.6	0.0	0.0	0.4	0.1	0.0	0.6	
Delay (s)					28.3	27.3	3.9	6.2	4.9	3.1	6.1	
Level of Service					C	C	A	A	A	A	A	
Approach Delay (s)		0.0			28.0			6.0			5.9	
Approach LOS		A			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			6.3		HCM 2000 Level of Service				A			
HCM 2000 Volume to Capacity ratio			0.38									
Actuated Cycle Length (s)			65.0		Sum of lost time (s)				15.4			
Intersection Capacity Utilization			48.9%		ICU Level of Service				A			
Analysis Period (min)			15									
c Critical Lane Group												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	20	1	7	21	651	122	45	801	5
Future Volume (veh/h)	0	0	0	20	1	7	21	651	122	45	801	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	0	0	25	1	7	26	804	147	56	989	6
Adj No. of Lanes	0	1	0	0	1	1	1	2	1	1	2	0
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	124	0	203	6	106	447	2206	966	493	2318	14
Arrive On Green	0.00	0.00	0.00	0.07	0.07	0.07	0.03	0.65	0.65	0.05	0.67	0.67
Sat Flow, veh/h	0	1800	0	1370	87	1530	1619	3420	1498	1619	3485	21
Grp Volume(v), veh/h	0	0	0	26	0	7	26	804	147	56	485	510
Grp Sat Flow(s),veh/h/ln	0	1800	0	1457	0	1530	1619	1710	1498	1619	1710	1796
Q Serve(g_s), s	0.0	0.0	0.0	1.0	0.0	0.3	0.3	7.1	2.5	0.7	8.6	8.6
Cycle Q Clear(g_c), s	0.0	0.0	0.0	1.1	0.0	0.3	0.3	7.1	2.5	0.7	8.6	8.6
Prop In Lane	0.00		0.00	0.96		1.00	1.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	0	124	0	209	0	106	447	2206	966	493	1137	1195
V/C Ratio(X)	0.00	0.00	0.00	0.12	0.00	0.07	0.06	0.36	0.15	0.11	0.43	0.43
Avail Cap(c_a), veh/h	0	471	0	489	0	400	524	2206	966	584	1137	1195
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	28.7	0.0	28.3	3.9	5.4	4.5	3.6	5.1	5.1
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.3	0.0	0.3	0.0	0.5	0.3	0.0	1.2	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.5	0.0	0.1	0.1	3.4	1.1	0.3	4.4	4.6
LnGrp Delay(d),s/veh	0.0	0.0	0.0	28.9	0.0	28.6	4.0	5.8	4.9	3.6	6.3	6.2
LnGrp LOS				C		C	A	A	A	A	A	A
Approach Vol, veh/h		0			33			977			1051	
Approach Delay, s/veh		0.0			28.8			5.6			6.1	
Approach LOS					C			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.8	48.1		9.1	6.5	49.4		9.1				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	6.8	25.8		17.0	5.0	27.6		17.0				
Max Q Clear Time (g_c+I1), s	2.7	9.1		0.0	2.3	10.6		3.1				
Green Ext Time (p_c), s	0.0	12.7		0.0	0.0	12.8		0.1				
Intersection Summary												
HCM 2010 Ctrl Delay				6.2								
HCM 2010 LOS				A								

Timings

12: Waterman Av./Waterman Av. & Hospitality Ln.

3/27/2017

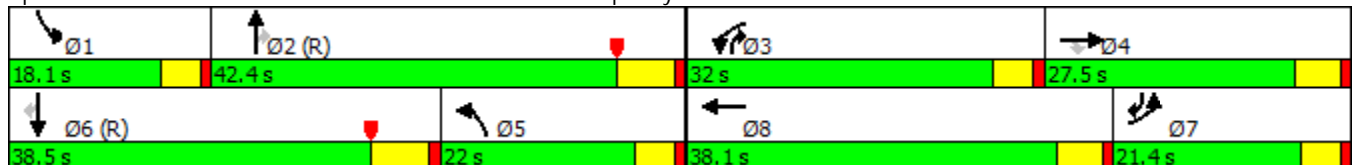


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗	↗	↗	↘	↗	↘
Traffic Volume (vph)	163	188	132	369	410	292	826	826	93	449	146
Future Volume (vph)	163	188	132	369	410	292	826	826	93	449	146
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8	5	2	3	1	6	7
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	3	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	15.1	15.1	9.6	38.1	9.6	36.2	9.6	9.6	36.2	9.6
Total Split (s)	21.4	27.5	27.5	32.0	38.1	22.0	42.4	32.0	18.1	38.5	21.4
Total Split (%)	17.8%	22.9%	22.9%	26.7%	31.8%	18.3%	35.3%	26.7%	15.1%	32.1%	17.8%
Yellow Time (s)	3.6	4.1	4.1	3.6	4.1	3.6	5.2	3.6	3.6	5.2	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	5.1	4.6	5.1	4.6	6.2	4.6	4.6	6.2	4.6
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effect Green (s)	15.8	19.2	19.2	20.1	23.5	17.4	49.4	75.7	10.8	42.8	64.8
Actuated g/C Ratio	0.13	0.16	0.16	0.17	0.20	0.14	0.41	0.63	0.09	0.36	0.54
v/c Ratio	0.78	0.41	0.24	0.74	0.72	0.68	0.60	0.36	0.65	0.25	0.15
Control Delay	74.0	43.6	1.9	56.0	49.1	56.8	32.0	4.8	71.9	29.3	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.0	43.6	1.9	56.0	49.1	56.8	32.0	4.8	71.9	29.3	5.5
LOS	E	D	A	E	D	E	C	A	E	C	A
Approach Delay		45.5			52.1		24.1			30.0	
Approach LOS		D			D		C			C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 105
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 33.7
 Intersection LOS: C
 Intersection Capacity Utilization 79.9%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 12: Waterman Av./Waterman Av. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
12: Waterman Av./Waterman Av. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗		↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	163	188	132	369	410	68	292	826	826	93	449	146
Future Volume (vph)	163	188	132	369	410	68	292	826	826	93	449	146
Ideal Flow (vphpl)	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Lane Util. Factor	1.00	0.91	0.91	0.97	0.95		0.97	0.95	0.88	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	175	202	142	397	441	73	314	888	888	100	483	157
RTOR Reduction (vph)	0	13	88	0	12	0	0	0	223	0	0	60
Lane Group Flow (vph)	175	226	17	397	502	0	314	888	665	100	483	97
Confl. Peds. (#/hr)						9			1			3
Confl. Bikes (#/hr)						2			3			
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4						2			6
Actuated Green, G (s)	15.8	19.2	19.2	20.1	23.5		17.4	49.4	69.5	10.8	42.8	58.6
Effective Green, g (s)	15.8	19.2	19.2	20.1	23.5		17.4	49.4	69.5	10.8	42.8	58.6
Actuated g/C Ratio	0.13	0.16	0.16	0.17	0.20		0.14	0.41	0.58	0.09	0.36	0.49
Clearance Time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	4.0	2.0	2.0	4.0	2.0
Lane Grp Cap (vph)	223	576	288	536	705		464	1482	2085	153	1926	948
v/s Ratio Prot	c0.10	c0.06		0.12	c0.14		c0.10	c0.25	0.05	c0.06	0.09	0.01
v/s Ratio Perm			0.01						0.13			0.04
v/c Ratio	0.78	0.39	0.06	0.74	0.71		0.68	0.60	0.32	0.65	0.25	0.10
Uniform Delay, d1	50.5	45.2	42.7	47.5	45.1		48.6	27.6	13.0	52.8	27.3	16.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.3	0.4	0.1	4.8	3.4		3.1	1.8	0.0	7.4	0.3	0.0
Delay (s)	65.7	45.6	42.8	52.3	48.5		51.7	29.4	13.1	60.2	27.6	16.6
Level of Service	E	D	D	D	D		D	C	B	E	C	B
Approach Delay (s)		51.8			50.1			25.8			29.7	
Approach LOS		D			D			C			C	
























Intersection Summary		
HCM 2000 Control Delay	34.8	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.67	
Actuated Cycle Length (s)	120.0	Sum of lost time (s) 20.5
Intersection Capacity Utilization	79.9%	ICU Level of Service D
Analysis Period (min)	15	

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
 12: Waterman Av./Waterman Av. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	163	188	132	369	410	68	292	826	826	93	449	146
Future Volume (veh/h)	163	188	132	369	410	68	292	826	826	93	449	146
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	175	202	68	397	441	58	314	888	456	100	483	59
Adj No. of Lanes	1	2	1	2	2	0	2	2	2	1	3	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	203	601	255	452	576	75	671	1485	1553	122	1323	602
Arrive On Green	0.13	0.17	0.17	0.15	0.19	0.19	0.23	0.43	0.43	0.08	0.27	0.27
Sat Flow, veh/h	1619	3600	1530	2956	3030	396	2956	3420	2629	1619	4914	1525
Grp Volume(v), veh/h	175	202	68	397	248	251	314	888	456	100	483	59
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	1710	1717	1478	1710	1315	1619	1638	1525
Q Serve(g_s), s	12.7	5.9	2.9	15.8	16.5	16.7	11.0	23.8	10.4	7.3	9.6	0.0
Cycle Q Clear(g_c), s	12.7	5.9	2.9	15.8	16.5	16.7	11.0	23.8	10.4	7.3	9.6	0.0
Prop In Lane	1.00		1.00	1.00		0.23	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	203	601	255	452	325	326	671	1485	1553	122	1323	602
V/C Ratio(X)	0.86	0.34	0.27	0.88	0.76	0.77	0.47	0.60	0.29	0.82	0.37	0.10
Avail Cap(c_a), veh/h	227	672	286	675	470	472	671	1485	1553	182	1323	602
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.77	0.77	0.77	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.5	44.1	16.5	49.7	46.0	46.1	40.1	25.9	12.4	54.7	35.5	22.9
Incr Delay (d2), s/veh	23.3	0.3	0.6	5.0	3.4	3.7	0.2	1.8	0.5	10.4	0.8	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.0	3.0	1.2	6.8	8.1	8.2	4.5	11.6	3.9	3.6	4.4	1.3
LnGrp Delay(d),s/veh	74.8	44.4	17.0	54.7	49.4	49.8	40.3	27.7	12.9	65.1	36.3	23.2
LnGrp LOS	E	D	B	D	D	D	D	C	B	E	D	C
Approach Vol, veh/h		445			896			1658			642	
Approach Delay, s/veh		52.2			51.9			26.0			39.6	
Approach LOS		D			D			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.6	58.3	22.9	25.1	33.4	38.5	20.2	27.9				
Change Period (Y+Rc), s	4.6	6.2	4.6	5.1	6.2	* 6.2	5.1	* 5.1				
Max Green Setting (Gmax), s	13.5	36.2	27.4	22.4	17.4	* 32	16.8	* 33				
Max Q Clear Time (g_c+I1), s	9.3	25.8	17.8	7.9	13.0	11.6	14.7	18.7				
Green Ext Time (p_c), s	0.0	7.0	0.6	1.4	0.6	4.2	0.4	2.5				
Intersection Summary												
HCM 2010 Ctrl Delay			38.0									
HCM 2010 LOS			D									
Notes												

Intersection

Int Delay, s/veh 1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↘ ↗	↗ ↗	↗ ↗ ↗	
Traffic Vol, veh/h	0	0	289	1944	795	158
Future Vol, veh/h	0	0	289	1944	795	158
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	0	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	301	2025	828	165

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	414	828 0
Stage 1	-	-	- -
Stage 2	-	-	- -
Critical Hdwy	-	7.1	5.3 -
Critical Hdwy Stg 1	-	-	- -
Critical Hdwy Stg 2	-	-	- -
Follow-up Hdwy	-	3.9	3.1 -
Pot Cap-1 Maneuver	0	*745	*937 -
Stage 1	0	-	- -
Stage 2	0	-	- -
Platoon blocked, %	-	1	1 -
Mov Cap-1 Maneuver	-	*745	*937 -
Mov Cap-2 Maneuver	-	-	- -
Stage 1	-	-	- -
Stage 2	-	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	0	1.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	* 937	-	-	-	-
HCM Lane V/C Ratio	0.321	-	-	-	-
HCM Control Delay (s)	10.7	-	0	-	-
HCM Lane LOS	B	-	A	-	-
HCM 95th %tile Q(veh)	1.4	-	-	-	-

Notes

-: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations						↗		↕			↕	
Traffic Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Future Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	-	-	-	Free	-	-	-	-	-	None
Storage Length	-	-	-	-	-	0	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	1209	0	998	0	0	746	171

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	-	-	-	-	0	-	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	0	0	-	0	0	-	0
Stage 1	0	0	0	0	-	0	0	-	0
Stage 2	0	0	0	0	-	0	0	-	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	0	-	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	0	-	-	-	-	-	-	-
Stage 1	-	0	-	-	-	-	-	-	-
Stage 2	-	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBTWBLn1	SBT	SBR
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	-	0	-
HCM Lane LOS	-	A	-
HCM 95th %tile Q(veh)	-	-	-

Intersection

Int Delay, s/veh

Movement	NWL	NWR
Lane Configurations		
Traffic Vol, veh/h	0	0
Future Vol, veh/h	0	0
Conflicting Peds, #/hr	0	0
Sign Control	Stop	Stop
RT Channelized	-	-
Storage Length	-	-
Veh in Median Storage, #	0	-
Grade, %	0	-
Peak Hour Factor	95	95
Heavy Vehicles, %	0	0
Mvmt Flow	0	0

Major/Minor

Conflicting Flow All

Stage 1

Stage 2

Critical Hdwy

Critical Hdwy Stg 1

Critical Hdwy Stg 2

Follow-up Hdwy

Pot Cap-1 Maneuver

Stage 1

Stage 2

Platoon blocked, %

Mov Cap-1 Maneuver

Mov Cap-2 Maneuver

Stage 1

Stage 2

Approach

HCM Control Delay, s

HCM LOS

Minor Lane/Major Mvmt

Timings

15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.

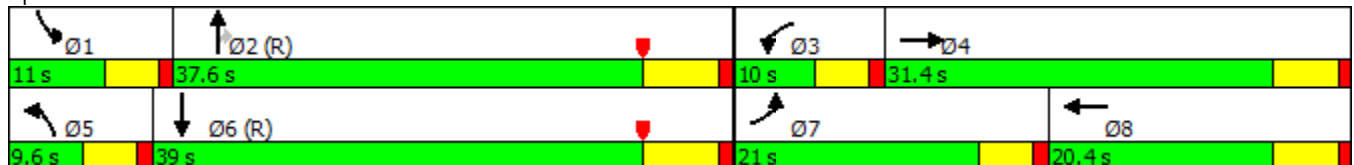


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖↗	↕	↖	↕	↖	↕	↗	↖	↕
Traffic Volume (vph)	485	378	111	228	40	783	113	75	408
Future Volume (vph)	485	378	111	228	40	783	113	75	408
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	9.6	31.4	9.6	15.4	9.6	36.2	36.2	9.6	36.2
Total Split (s)	21.0	31.4	10.0	20.4	9.6	37.6	37.6	11.0	39.0
Total Split (%)	23.3%	34.9%	11.1%	22.7%	10.7%	41.8%	41.8%	12.2%	43.3%
Yellow Time (s)	3.6	4.4	3.6	4.4	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	5.4	4.6	6.2	6.2	4.6	6.2
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)	16.0	22.9	5.4	12.4	5.7	35.7	35.7	7.1	39.1
Actuated g/C Ratio	0.18	0.25	0.06	0.14	0.06	0.40	0.40	0.08	0.43
v/c Ratio	0.89	0.62	1.14	0.63	0.40	0.57	0.14	0.58	0.38
Control Delay	55.5	24.6	172.3	33.8	51.9	24.5	0.7	59.0	16.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.5	24.6	172.3	33.8	51.9	24.5	0.7	59.0	16.7
LOS	E	C	F	C	D	C	A	E	B
Approach Delay		38.2		68.4		22.8			21.4
Approach LOS		D		E		C			C

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.14
 Intersection Signal Delay: 34.3
 Intersection LOS: C
 Intersection Capacity Utilization 73.7%
 ICU Level of Service D
 Analysis Period (min) 15























Splits and Phases: 15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.



HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 15: Waterman Av./Waterman Av. & Redlands Bl./Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	485	378	240	111	228	107	40	783	113	75	408	184
Future Volume (vph)	485	378	240	111	228	107	40	783	113	75	408	184
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.94		1.00	0.95		1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Flt Permitted	1.00	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	505	394	250	116	238	111	42	816	118	78	425	192
RTOR Reduction (vph)	0	118	0	0	63	0	0	0	73	0	53	0
Lane Group Flow (vph)	505	526	0	116	286	0	42	816	45	78	564	0
Confl. Peds. (#/hr)			3						1			4
Confl. Bikes (#/hr)			1						1			
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	16.0	23.0		5.4	12.4		3.6	34.7	34.7	6.1	37.2	
Effective Green, g (s)	16.0	23.0		5.4	12.4		3.6	34.7	34.7	6.1	37.2	
Actuated g/C Ratio	0.18	0.26		0.06	0.14		0.04	0.39	0.39	0.07	0.41	
Clearance Time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	568	920		102	496		68	1388	694	115	1488	
v/s Ratio Prot	c0.16	c0.15		0.07	0.08		0.02	c0.23		c0.05	0.16	
v/s Ratio Perm									0.03			
v/c Ratio	0.89	0.57		1.14	0.58		0.62	0.59	0.07	0.68	0.38	
Uniform Delay, d1	36.1	29.2		42.3	36.3		42.5	22.0	17.4	41.0	18.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	15.3	0.9		130.8	1.6		11.2	1.8	0.2	11.8	0.7	
Delay (s)	51.4	30.1		173.1	38.0		53.7	23.8	17.6	52.8	19.1	
Level of Service	D	C		F	D		D	C	B	D	B	
Approach Delay (s)		39.4			71.7			24.3			22.9	
Approach LOS		D			E			C			C	
Intersection Summary												
HCM 2000 Control Delay			36.0								HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			90.0								Sum of lost time (s)	20.8
Intersection Capacity Utilization			73.7%								ICU Level of Service	D
Analysis Period (min)			15									

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	485	378	240	111	228	107	40	783	113	75	408	184
Future Volume (veh/h)	485	378	240	111	228	107	40	783	113	75	408	184
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	505	394	196	116	238	86	42	816	76	78	425	137
Adj No. of Lanes	2	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	539	580	285	97	347	122	58	1323	584	97	1047	334
Arrive On Green	0.18	0.26	0.26	0.06	0.14	0.14	0.04	0.39	0.39	0.06	0.41	0.41
Sat Flow, veh/h	2956	2212	1085	1619	2482	873	1619	3420	1510	1619	2550	814
Grp Volume(v), veh/h	505	303	287	116	162	162	42	816	76	78	284	278
Grp Sat Flow(s),veh/h/ln	1478	1710	1587	1619	1710	1646	1619	1710	1510	1619	1710	1654
Q Serve(g_s), s	15.2	14.3	14.6	5.4	8.1	8.5	2.3	17.3	2.9	4.3	10.6	10.7
Cycle Q Clear(g_c), s	15.2	14.3	14.6	5.4	8.1	8.5	2.3	17.3	2.9	4.3	10.6	10.7
Prop In Lane	1.00		0.68	1.00		0.53	1.00		1.00	1.00		0.49
Lane Grp Cap(c), veh/h	539	448	416	97	239	230	58	1323	584	97	702	679
V/C Ratio(X)	0.94	0.68	0.69	1.19	0.68	0.70	0.72	0.62	0.13	0.80	0.40	0.41
Avail Cap(c_a), veh/h	539	494	459	97	285	274	90	1323	584	115	702	679
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.83	0.83	0.83	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.3	29.8	29.9	42.3	36.8	36.9	42.9	22.2	17.8	41.8	18.7	18.8
Incr Delay (d2), s/veh	21.0	2.7	3.2	152.6	4.9	6.3	6.0	2.2	0.5	24.3	1.7	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.7	7.1	6.7	6.5	4.2	4.2	1.1	8.6	1.3	2.6	5.3	5.2
LnGrp Delay(d),s/veh	57.3	32.5	33.1	194.9	41.7	43.3	48.9	24.4	18.3	66.1	20.5	20.6
LnGrp LOS	E	C	C	F	D	D	D	C	B	E	C	C
Approach Vol, veh/h		1095			440			934			640	
Approach Delay, s/veh		44.1			82.7			25.0			26.1	
Approach LOS		D			F			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.0	41.0	10.0	29.0	7.9	43.2	21.0	18.0				
Change Period (Y+Rc), s	4.6	6.2	4.6	5.4	4.6	6.2	4.6	5.4				
Max Green Setting (Gmax), s	6.4	31.4	5.4	26.0	5.0	32.8	16.4	15.0				
Max Q Clear Time (g_c+I1), s	6.3	19.3	7.4	16.6	4.3	12.7	17.2	10.5				
Green Ext Time (p_c), s	0.0	8.1	0.0	3.6	0.0	11.5	0.0	2.1				
Intersection Summary												
HCM 2010 Ctrl Delay			40.1									
HCM 2010 LOS			D									

Timings
16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

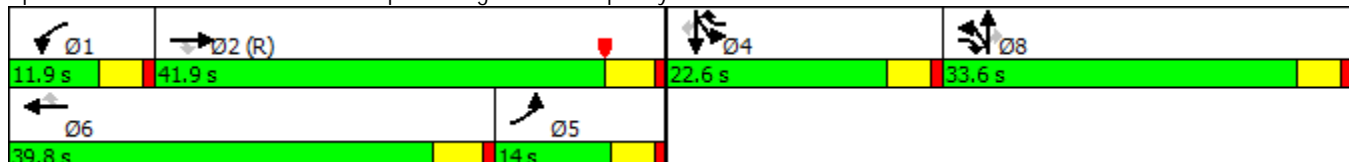


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	82	180	56	43	104	597	337	638	187	8	377	82
Future Volume (vph)	82	180	56	43	104	597	337	638	187	8	377	82
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	8	1	6	4	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	39.1	33.6	9.6	39.1	22.6	33.6	33.6	33.6	22.6	22.6	22.6
Total Split (s)	14.0	41.9	33.6	11.9	39.8	22.6	33.6	33.6	33.6	22.6	22.6	22.6
Total Split (%)	12.7%	38.1%	30.5%	10.8%	36.2%	20.5%	30.5%	30.5%	30.5%	20.5%	20.5%	20.5%
Yellow Time (s)	3.6	4.1	3.6	3.6	4.1	3.6	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	C-Max	Max	None	None	Max	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	23.4	40.0	70.4	6.0	22.7	41.2	29.0	29.0	29.0	18.0	18.0	18.0
Actuated g/C Ratio	0.21	0.36	0.64	0.05	0.21	0.37	0.26	0.26	0.26	0.16	0.16	0.16
v/c Ratio	0.23	0.14	0.05	0.25	0.42	0.52	0.69	0.72	0.32	0.03	0.65	0.20
Control Delay	38.2	24.9	1.2	53.0	12.1	13.4	45.8	41.9	8.5	39.1	49.0	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.2	24.9	1.2	53.0	12.1	13.4	45.8	41.9	8.5	39.1	49.0	1.0
LOS	D	C	A	D	B	B	D	D	A	D	D	A
Approach Delay		24.2			15.0			37.6			40.4	
Approach LOS		C			B			D			D	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:EBT, Start of Yellow
 Natural Cycle: 105
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.72
 Intersection Signal Delay: 30.2
 Intersection LOS: C
 Intersection Capacity Utilization 78.5%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)

























3/30/2017



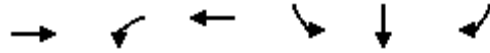
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	82	180	56	43	104	597	337	638	187	8	377	82
Future Volume (vph)	82	180	56	43	104	597	337	638	187	8	377	82
Ideal Flow (vphpl)	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lane Util. Factor	1.00	0.95	1.00	0.97	0.91	0.91	0.91	0.91	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	0.99	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.89	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600	1382	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600	1382	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	84	184	57	44	106	609	344	651	191	8	385	84
RTOR Reduction (vph)	0	0	22	0	245	64	0	0	123	0	0	70
Lane Group Flow (vph)	84	184	35	44	166	240	310	685	68	8	385	14
Confl. Peds. (#/hr)			2			1						
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	22.3	39.1	68.1	5.0	21.8	39.8	29.0	29.0	29.0	18.0	18.0	18.0
Effective Green, g (s)	22.3	39.1	68.1	5.0	21.8	39.8	29.0	29.0	29.0	18.0	18.0	18.0
Actuated g/C Ratio	0.20	0.36	0.62	0.05	0.20	0.36	0.26	0.26	0.26	0.16	0.16	0.16
Clearance Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	344	1279	1114	145	713	500	448	949	474	278	589	294
v/s Ratio Prot	c0.05	0.05	0.01	0.01	0.05	c0.08	0.18	c0.19		0.00	c0.11	
v/s Ratio Perm			0.01			0.09			0.04			0.01
v/c Ratio	0.24	0.14	0.03	0.30	0.23	0.48	0.69	0.72	0.14	0.03	0.65	0.05
Uniform Delay, d1	36.8	24.1	8.1	50.8	37.1	27.1	36.5	36.8	31.0	38.7	43.1	38.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.2	0.1	0.4	0.2	0.7	8.5	4.7	0.6	0.2	5.6	0.3
Delay (s)	36.9	24.3	8.2	51.2	37.2	27.8	45.0	41.6	31.6	38.8	48.6	39.1
Level of Service	D	C	A	D	D	C	D	D	C	D	D	D
Approach Delay (s)		24.7			34.3			40.9			46.8	
Approach LOS		C			C			D			D	

Intersection Summary		
HCM 2000 Control Delay	38.2	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.53	D
Actuated Cycle Length (s)	110.0	Sum of lost time (s)
Intersection Capacity Utilization	78.5%	18.9
Analysis Period (min)	15	ICU Level of Service
		D

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	82	180	56	43	104	597	337	638	187	8	377	82
Future Volume (veh/h)	82	180	56	43	104	597	337	638	187	8	377	82
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	84	184	40	44	106	597	332	668	151	8	385	66
Adj No. of Lanes	1	2	1	2	1	2	1	2	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	313	1256	957	102	365	1120	427	949	403	265	560	250
Arrive On Green	0.19	0.37	0.37	0.03	0.20	0.20	0.26	0.26	0.26	0.16	0.16	0.16
Sat Flow, veh/h	1619	3420	1508	3048	1800	3052	1619	3600	1530	1619	3420	1530
Grp Volume(v), veh/h	84	184	40	44	106	597	332	668	151	8	385	66
Grp Sat Flow(s),veh/h/ln	1619	1710	1508	1524	1800	1526	1619	1800	1530	1619	1710	1530
Q Serve(g_s), s	4.9	4.0	1.1	1.6	5.5	16.9	20.9	18.5	8.9	0.5	11.7	4.1
Cycle Q Clear(g_c), s	4.9	4.0	1.1	1.6	5.5	16.9	20.9	18.5	8.9	0.5	11.7	4.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	313	1256	957	102	365	1120	427	949	403	265	560	250
V/C Ratio(X)	0.27	0.15	0.04	0.43	0.29	0.53	0.78	0.70	0.37	0.03	0.69	0.26
Avail Cap(c_a), veh/h	313	1256	957	202	568	1464	427	949	403	265	560	250
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.7	23.3	7.7	52.1	37.1	27.4	37.5	36.6	33.1	38.7	43.4	40.2
Incr Delay (d2), s/veh	0.2	0.2	0.1	1.1	0.4	0.4	13.1	4.4	2.6	0.2	6.8	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	1.9	0.8	0.7	2.8	9.0	10.9	9.8	4.0	0.2	6.0	1.9
LnGrp Delay(d),s/veh	37.9	23.5	7.8	53.2	37.6	27.8	50.6	41.0	35.7	38.9	50.1	42.8
LnGrp LOS	D	C	A	D	D	C	D	D	D	D	D	D
Approach Vol, veh/h		308			747			1151			459	
Approach Delay, s/veh		25.4			30.7			43.1			48.9	
Approach LOS		C			C			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.3	45.5		22.6	26.4	27.4		33.6				
Change Period (Y+Rc), s	4.6	5.1		4.6	5.1	* 5.1		4.6				
Max Green Setting (Gmax), s	7.3	36.8		18.0	9.4	* 35		29.0				
Max Q Clear Time (g_c+I1), s	3.6	6.0		13.7	6.9	18.9		22.9				
Green Ext Time (p_c), s	0.0	1.3		1.1	0.3	2.8		2.9				
Intersection Summary												
HCM 2010 Ctrl Delay			38.6									
HCM 2010 LOS			D									
Notes												

Timings
1: I-215 SB Ramps & Auto Center Rd.

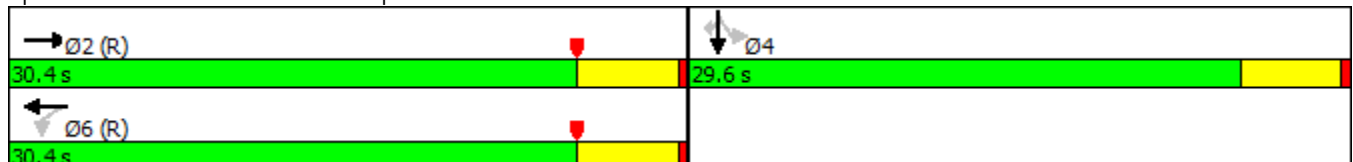


Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Configurations	↑↑		↑↑	↘	↙	↗
Traffic Volume (vph)	451	8	327	571	104	276
Future Volume (vph)	451	8	327	571	104	276
Turn Type	NA	Perm	NA	Perm	NA	Perm
Protected Phases	2		6		4	
Permitted Phases		6		4		4
Detector Phase	2	6	6	4	4	4
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	30.0	22.5	22.5	22.5	22.5	22.5
Total Split (s)	30.4	30.4	30.4	29.6	29.6	29.6
Total Split (%)	50.7%	50.7%	50.7%	49.3%	49.3%	49.3%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0		5.0	5.0	5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	Max	Max	Max
Act Effct Green (s)	25.4		25.4	24.6	24.6	24.6
Actuated g/C Ratio	0.42		0.42	0.41	0.41	0.41
v/c Ratio	0.41		0.23	0.50	0.48	0.32
Control Delay	10.6		6.3	16.3	15.7	2.8
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	10.6		6.3	16.3	15.7	2.8
LOS	B		A	B	B	A
Approach Delay	10.6		6.3		12.2	
Approach LOS	B		A		B	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 50 (83%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.50
 Intersection Signal Delay: 10.6
 Intersection LOS: B
 Intersection Capacity Utilization 48.7%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 1: I-215 SB Ramps & Auto Center Rd.



HCM Signalized Intersection Capacity Analysis
1: I-215 SB Ramps & Auto Center Rd.

Gateway South Building 4 TIA (JN 10187)


















3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑					↘	↙	↗
Traffic Volume (vph)	0	451	179	8	327	0	0	0	0	571	104	276
Future Volume (vph)	0	451	179	8	327	0	0	0	0	571	104	276
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		5.0			5.0					5.0	5.0	5.0
Lane Util. Factor		0.95			0.95					0.95	0.95	1.00
Frbp, ped/bikes		0.99			1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00			1.00					1.00	1.00	1.00
Frt		0.96			1.00					1.00	1.00	0.85
Flt Protected		1.00			1.00					0.95	0.97	1.00
Satd. Flow (prot)		3600			3600					1700	1800	1800
Flt Permitted		1.00			0.94					0.95	0.97	1.00
Satd. Flow (perm)		3600			3600					1700	1800	1800
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	470	186	8	341	0	0	0	0	595	108	288
RTOR Reduction (vph)	0	70	0	0	0	0	0	0	0	0	0	170
Lane Group Flow (vph)	0	586	0	0	349	0	0	0	0	351	352	118
Confl. Peds. (#/hr)			1									
Confl. Bikes (#/hr)			1									
Turn Type		NA		Perm	NA					Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases				6						4		4
Actuated Green, G (s)		25.4			25.4					24.6	24.6	24.6
Effective Green, g (s)		25.4			25.4					24.6	24.6	24.6
Actuated g/C Ratio		0.42			0.42					0.41	0.41	0.41
Clearance Time (s)		5.0			5.0					5.0	5.0	5.0
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1524			1524					697	738	738
v/s Ratio Prot		c0.16										
v/s Ratio Perm					0.10					c0.21	0.20	0.07
v/c Ratio		0.38			0.23					0.50	0.48	0.16
Uniform Delay, d1		11.9			11.0					13.2	13.0	11.2
Progression Factor		1.00			0.54					1.00	1.00	1.00
Incremental Delay, d2		0.7			0.3					2.6	2.2	0.5
Delay (s)		12.6			6.3					15.7	15.2	11.6
Level of Service		B			A					B	B	B
Approach Delay (s)		12.6			6.3			0.0			14.4	
Approach LOS		B			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	451	179	8	327	0	0	0	0	571	104	276
Future Volume (veh/h)	0	451	179	8	327	0	0	0	0	571	104	276
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1800	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	470	135	8	341	0				672	0	167
Adj No. of Lanes	0	2	0	0	2	0				2	0	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1107	315	71	1403	0				1328	0	627
Arrive On Green	0.00	0.42	0.42	0.85	0.85	0.00				0.41	0.00	0.41
Sat Flow, veh/h	0	2704	745	20	3395	0				3238	0	1530
Grp Volume(v), veh/h	0	306	299	187	162	0				672	0	167
Grp Sat Flow(s),veh/h/ln	0	1710	1649	1777	1556	0				1619	0	1530
Q Serve(g_s), s	0.0	7.5	7.7	0.0	1.2	0.0				9.3	0.0	4.3
Cycle Q Clear(g_c), s	0.0	7.5	7.7	1.2	1.2	0.0				9.3	0.0	4.3
Prop In Lane	0.00		0.45	0.04		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	724	698	815	659	0				1328	0	627
V/C Ratio(X)	0.00	0.42	0.43	0.23	0.25	0.00				0.51	0.00	0.27
Avail Cap(c_a), veh/h	0	724	698	815	659	0				1328	0	627
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	12.2	12.2	2.7	2.7	0.0				13.2	0.0	11.7
Incr Delay (d2), s/veh	0.0	1.8	1.9	0.7	0.9	0.0				1.4	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.9	3.9	0.7	0.6	0.0				4.4	0.0	2.0
LnGrp Delay(d),s/veh	0.0	14.0	14.1	3.4	3.6	0.0				14.6	0.0	12.8
LnGrp LOS		B	B	A	A					B		B
Approach Vol, veh/h		605			349						839	
Approach Delay, s/veh		14.0			3.5						14.2	
Approach LOS		B			A						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		30.4		29.6		30.4						
Change Period (Y+Rc), s		5.0		5.0		5.0						
Max Green Setting (Gmax), s		25.4		24.6		25.4						
Max Q Clear Time (g_c+I1), s		9.7		11.3		3.2						
Green Ext Time (p_c), s		5.0		2.6		5.6						
Intersection Summary												
HCM 2010 Ctrl Delay				12.1								
HCM 2010 LOS				B								
Notes												

Timings

2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations	↶	↷↷	↷↷	↷	↶	↷	↷↷
Traffic Volume (vph)	229	793	851	653	119	7	932
Future Volume (vph)	229	793	851	653	119	7	932
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm
Protected Phases	5	2	6		8	8	
Permitted Phases				6			8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	8.0	8.0	8.0	5.0	5.0	5.0
Minimum Split (s)	8.5	39.0	13.0	13.0	10.0	10.0	10.0
Total Split (s)	9.8	39.0	29.2	29.2	21.0	21.0	21.0
Total Split (%)	16.3%	65.0%	48.7%	48.7%	35.0%	35.0%	35.0%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max
Act Effct Green (s)	6.3	34.0	24.2	24.2	16.0	16.0	16.0
Actuated g/C Ratio	0.10	0.57	0.40	0.40	0.27	0.27	0.27
v/c Ratio	1.31	0.40	0.60	0.59	0.14	0.13	0.81
Control Delay	199.5	5.0	11.9	3.8	17.8	17.7	21.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.7
Total Delay	199.5	5.0	11.9	3.8	17.8	17.7	21.7
LOS	F	A	B	A	B	B	C
Approach Delay		48.6	8.4			21.2	
Approach LOS		D	A			C	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 43 (72%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.31
 Intersection Signal Delay: 23.7
 Intersection LOS: C
 Intersection Capacity Utilization 72.7%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.



HCM Signalized Intersection Capacity Analysis

Gateway South Building 4 TIA (JN 10187)

2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.

3/27/2017

























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↗	↗↗			
Traffic Volume (vph)	229	793	0	0	851	653	119	7	932	0	0	0
Future Volume (vph)	229	793	0	0	851	653	119	7	932	0	0	0
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800	1700	1800	1800	1800	1800	1800
Total Lost time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	0.88			
Frbp, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.96	1.00			
Satd. Flow (prot)	1700	3600			3600	1800	1700	1800	3600			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.96	1.00			
Satd. Flow (perm)	1700	3600			3600	1800	1700	1800	3600			
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	234	809	0	0	868	666	121	7	951	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	397	0	0	215	0	0	0
Lane Group Flow (vph)	234	809	0	0	868	269	64	64	736	0	0	0
Confl. Peds. (#/hr)			1									
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	6.3	34.0			24.2	24.2	16.0	16.0	16.0			
Effective Green, g (s)	6.3	34.0			24.2	24.2	16.0	16.0	16.0			
Actuated g/C Ratio	0.10	0.57			0.40	0.40	0.27	0.27	0.27			
Clearance Time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Vehicle Extension (s)	2.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	178	2040			1452	726	453	480	960			
v/s Ratio Prot	c0.14	0.22			c0.24		0.04	0.04				
v/s Ratio Perm						0.15			c0.20			
v/c Ratio	1.31	0.40			0.60	0.37	0.14	0.13	0.77			
Uniform Delay, d1	26.9	7.3			14.1	12.6	16.8	16.7	20.3			
Progression Factor	0.86	0.60			0.76	2.58	1.00	1.00	1.00			
Incremental Delay, d2	172.9	0.5			1.1	0.8	0.7	0.6	5.8			
Delay (s)	195.9	4.9			11.8	33.2	17.4	17.3	26.1			
Level of Service	F	A			B	C	B	B	C			
Approach Delay (s)		47.7			21.1			25.1			0.0	
Approach LOS		D			C			C			A	

Intersection Summary

HCM 2000 Control Delay	29.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 				 			
Traffic Volume (veh/h)	229	793	0	0	851	653	119	7	932	0	0	0
Future Volume (veh/h)	229	793	0	0	851	653	119	7	932	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1700	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	234	809	0	0	868	462	126	0	617			
Adj No. of Lanes	1	2	0	0	2	1	2	0	2			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	170	1938	0	0	1379	617	863	0	816			
Arrive On Green	0.11	0.57	0.00	0.00	0.40	0.40	0.27	0.00	0.27			
Sat Flow, veh/h	1619	3510	0	0	3510	1530	3238	0	3060			
Grp Volume(v), veh/h	234	809	0	0	868	462	126	0	617			
Grp Sat Flow(s),veh/h/ln	1619	1710	0	0	1710	1530	1619	0	1530			
Q Serve(g_s), s	6.3	8.1	0.0	0.0	12.2	15.5	1.8	0.0	11.1			
Cycle Q Clear(g_c), s	6.3	8.1	0.0	0.0	12.2	15.5	1.8	0.0	11.1			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	170	1938	0	0	1379	617	863	0	816			
V/C Ratio(X)	1.38	0.42	0.00	0.00	0.63	0.75	0.15	0.00	0.76			
Avail Cap(c_a), veh/h	170	1938	0	0	1379	617	863	0	816			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.46	0.46	1.00	0.00	1.00			
Uniform Delay (d), s/veh	26.9	7.4	0.0	0.0	14.3	15.3	16.8	0.0	20.2			
Incr Delay (d2), s/veh	201.9	0.7	0.0	0.0	1.0	3.9	0.4	0.0	6.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	12.3	3.9	0.0	0.0	5.9	7.1	0.8	0.0	5.4			
LnGrp Delay(d),s/veh	228.7	8.0	0.0	0.0	15.3	19.2	17.1	0.0	26.7			
LnGrp LOS	F	A			B	B	B		C			
Approach Vol, veh/h		1043			1330			743				
Approach Delay, s/veh		57.6			16.7			25.1				
Approach LOS		E			B			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		39.0			9.8	29.2		21.0				
Change Period (Y+Rc), s		5.0			3.5	5.0		5.0				
Max Green Setting (Gmax), s		34.0			6.3	24.2		16.0				
Max Q Clear Time (g_c+I1), s		10.1			8.3	17.5		13.1				
Green Ext Time (p_c), s		14.6			0.0	5.4		1.0				
Intersection Summary												
HCM 2010 Ctrl Delay			32.4									
HCM 2010 LOS			C									
Notes												

Timings
3: E St. & Orange Show Rd.

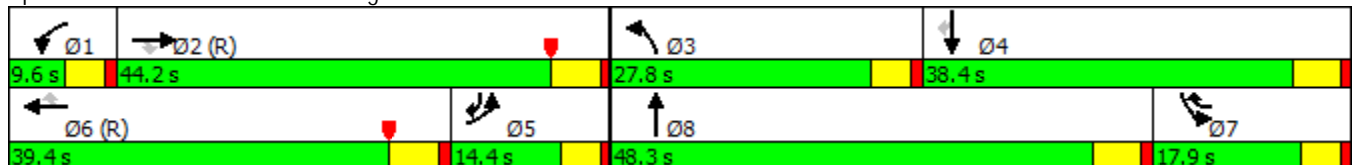


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑	↗	↔↔	↑↑	↗	↗	↑↑	↔↔	↑↑	↗
Traffic Volume (vph)	237	1126	354	150	851	126	316	385	227	268	258
Future Volume (vph)	237	1126	354	150	851	126	316	385	227	268	258
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8	7	4	5
Permitted Phases			2			6					4
Detector Phase	5	2	2	1	6	7	3	8	7	4	5
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0
Minimum Split (s)	9.6	39.4	39.4	9.6	39.4	9.6	9.6	38.4	9.6	38.4	9.6
Total Split (s)	14.4	44.2	44.2	9.6	39.4	17.9	27.8	48.3	17.9	38.4	14.4
Total Split (%)	12.0%	36.8%	36.8%	8.0%	32.8%	14.9%	23.2%	40.3%	14.9%	32.0%	12.0%
Yellow Time (s)	3.6	4.4	4.4	3.6	4.4	3.6	3.6	4.4	3.6	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4	4.6	5.4	4.6
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	Max	None	Max	None
Act Effct Green (s)	9.8	38.8	38.8	5.0	34.0	52.7	23.2	42.9	13.3	33.0	43.6
Actuated g/C Ratio	0.08	0.32	0.32	0.04	0.28	0.44	0.19	0.36	0.11	0.28	0.36
v/c Ratio	0.95	1.01	0.47	1.17	0.87	0.15	1.06	0.42	0.67	0.28	0.37
Control Delay	94.0	67.6	11.7	161.4	52.8	8.4	115.8	27.5	61.2	35.1	10.1
Queue Delay	0.0	7.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.0	75.5	11.7	161.4	52.8	8.4	115.8	27.5	61.2	35.1	10.1
LOS	F	E	B	F	D	A	F	C	E	D	B
Approach Delay		64.9			62.3			60.4		34.4	
Approach LOS		E			E			E		C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 108 (90%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.17
 Intersection Signal Delay: 58.2
 Intersection LOS: E
 Intersection Capacity Utilization 102.9%
 ICU Level of Service G
 Analysis Period (min) 15































Splits and Phases: 3: E St. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
3: E St. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 			 		 	 	
Traffic Volume (vph)	237	1126	354	150	851	126	316	385	145	227	268	258
Future Volume (vph)	237	1126	354	150	851	126	316	385	145	227	268	258
Ideal Flow (vphpl)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Total Lost time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95		0.97	0.95	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3200	3600	1800	3200	3600	1800	1600	3600		3200	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3200	3600	1800	3200	3600	1800	1600	3600		3200	3600	1800
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	247	1173	369	156	886	131	329	401	151	236	279	269
RTOR Reduction (vph)	0	0	198	0	0	68	0	32	0	0	0	68
Lane Group Flow (vph)	247	1173	171	156	886	63	329	520	0	236	279	201
Confl. Peds. (#/hr)									2			2
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	9.8	38.8	38.8	5.0	34.0	47.3	23.2	42.9		13.3	33.0	42.8
Effective Green, g (s)	9.8	38.8	38.8	5.0	34.0	47.3	23.2	42.9		13.3	33.0	42.8
Actuated g/C Ratio	0.08	0.32	0.32	0.04	0.28	0.39	0.19	0.36		0.11	0.28	0.36
Clearance Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	2.0	2.0	3.0		2.0	3.0	2.0
Lane Grp Cap (vph)	261	1164	582	133	1020	778	309	1287		354	990	642
v/s Ratio Prot	0.08	c0.33		0.05	c0.25	0.01	c0.21	c0.14		c0.07	0.08	0.03
v/s Ratio Perm			0.10			0.03						0.09
v/c Ratio	0.95	1.01	0.29	1.17	0.87	0.08	1.06	0.40		0.67	0.28	0.31
Uniform Delay, d1	54.8	40.6	30.4	57.5	40.9	22.7	48.4	28.9		51.2	34.2	28.0
Progression Factor	1.02	1.04	1.37	0.79	1.11	1.62	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	35.1	25.4	1.0	119.6	7.3	0.0	69.4	0.9		3.7	0.7	0.1
Delay (s)	91.3	67.7	42.5	165.1	52.5	36.9	117.8	29.9		54.9	34.9	28.1
Level of Service	F	E	D	F	D	D	F	C		D	C	C
Approach Delay (s)		65.7			65.7			62.7			38.6	
Approach LOS		E			E			E			D	
Intersection Summary												
HCM 2000 Control Delay			60.6									E
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			120.0							20.0		
Intersection Capacity Utilization			102.9%									G
Analysis Period (min)			15									
c Critical Lane Group												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	237	1126	354	150	851	126	316	385	145	227	268	258
Future Volume (veh/h)	237	1126	354	150	851	126	316	385	145	227	268	258
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	247	1173	193	156	886	75	329	401	120	236	279	162
Adj No. of Lanes	2	2	1	2	2	1	1	2	0	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	638	1587	710	123	969	593	295	930	275	308	940	750
Arrive On Green	0.43	0.93	0.93	0.01	0.09	0.09	0.19	0.36	0.36	0.10	0.28	0.28
Sat Flow, veh/h	2956	3420	1530	2956	3420	1530	1524	2602	770	2956	3420	1527
Grp Volume(v), veh/h	247	1173	193	156	886	75	329	262	259	236	279	162
Grp Sat Flow(s),veh/h/ln	1478	1710	1530	1478	1710	1530	1524	1710	1663	1478	1710	1527
Q Serve(g_s), s	6.8	9.4	1.5	5.0	30.8	0.0	23.2	14.0	14.2	9.3	7.7	3.3
Cycle Q Clear(g_c), s	6.8	9.4	1.5	5.0	30.8	0.0	23.2	14.0	14.2	9.3	7.7	3.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.46	1.00		1.00
Lane Grp Cap(c), veh/h	638	1587	710	123	969	593	295	611	594	308	941	750
V/C Ratio(X)	0.39	0.74	0.27	1.27	0.91	0.13	1.12	0.43	0.44	0.77	0.30	0.22
Avail Cap(c_a), veh/h	638	1587	710	123	969	593	295	611	594	328	941	750
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.75	0.75	0.75	0.65	0.65	0.65	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.7	2.6	2.4	59.2	52.9	30.4	48.4	29.2	29.3	52.3	34.3	10.8
Incr Delay (d2), s/veh	0.1	2.4	0.7	154.7	10.1	0.3	87.6	2.2	2.3	8.6	0.8	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	4.1	0.7	4.7	16.0	2.1	16.9	6.9	6.9	4.2	3.7	2.1
LnGrp Delay(d),s/veh	28.8	5.0	3.1	213.8	63.1	30.6	136.0	31.4	31.7	60.9	35.1	11.5
LnGrp LOS	C	A	A	F	E	C	F	C	C	E	D	B
Approach Vol, veh/h		1613			1117			850			677	
Approach Delay, s/veh		8.4			82.0			72.0			38.5	
Approach LOS		A			F			E			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.6	61.2	27.8	38.4	31.4	39.4	17.9	48.3				
Change Period (Y+Rc), s	4.6	5.4	4.6	5.4	5.4	* 5.4	5.4	* 5.4				
Max Green Setting (Gmax), s	5.0	38.8	23.2	33.0	9.8	* 34	13.3	* 43				
Max Q Clear Time (g_c+I1), s	7.0	11.4	25.2	9.7	8.8	32.8	11.3	16.2				
Green Ext Time (p_c), s	0.0	14.6	0.0	2.6	0.3	0.8	0.6	3.1				
Intersection Summary												
HCM 2010 Ctrl Delay			45.2									
HCM 2010 LOS			D									
Notes												

Timings
4: Arrowhead Av. & Orange Show Rd.

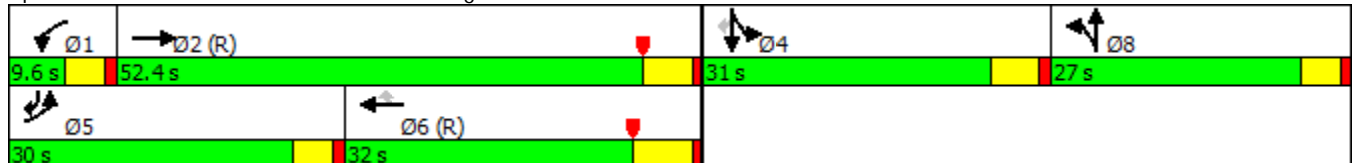


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	297	1033	10	645	139	21	9	188	2	495
Future Volume (vph)	297	1033	10	645	139	21	9	188	2	495
Turn Type	Prot	NA	Prot	NA	Perm	Split	NA	Split	NA	pm+ov
Protected Phases	5	2	1	6		8	8	4	4	5
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	8	8	4	4	5
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	28.4	9.6	29.2	29.2	28.6	28.6	29.4	29.4	9.6
Total Split (s)	30.0	52.4	9.6	32.0	32.0	27.0	27.0	31.0	31.0	30.0
Total Split (%)	25.0%	43.7%	8.0%	26.7%	26.7%	22.5%	22.5%	25.8%	25.8%	25.0%
Yellow Time (s)	3.6	4.4	3.6	5.2	5.2	3.6	3.6	4.4	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	6.2	6.2	4.6	4.6	5.4	5.4	4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	C-Max	None	C-Max	C-Max	Max	Max	Max	Max	None
Act Effct Green (s)	24.4	54.7	5.0	26.8	26.8	22.4	22.4	25.6	25.6	50.8
Actuated g/C Ratio	0.20	0.46	0.04	0.22	0.22	0.19	0.19	0.21	0.21	0.42
v/c Ratio	0.93	0.68	0.16	0.86	0.29	0.07	0.14	0.28	0.27	0.52
Control Delay	70.5	10.0	60.7	57.2	7.7	41.1	16.9	42.0	41.6	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.5	10.0	60.7	57.2	7.7	41.1	16.9	42.0	41.6	4.2
LOS	E	A	E	E	A	D	B	D	D	A
Approach Delay		23.4		48.6			24.4		14.6	
Approach LOS		C		D			C		B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 32 (27%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 28.3
 Intersection LOS: C
 Intersection Capacity Utilization 86.2%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 4: Arrowhead Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
4: Arrowhead Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)























3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	297	1033	4	10	645	139	21	9	38	188	2	495
Future Volume (vph)	297	1033	4	10	645	139	21	9	38	188	2	495
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	6.2	6.2	4.6	4.6		5.4	5.4	4.6
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		0.95	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	0.97		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.88		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00
Satd. Flow (prot)	1700	3600		1700	3600	1800	1700	1800		1700	1800	1800
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00
Satd. Flow (perm)	1700	3600		1700	3600	1800	1700	1800		1700	1800	1800
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	319	1111	4	11	694	149	23	10	41	202	2	532
RTOR Reduction (vph)	0	0	0	0	0	116	0	33	0	0	0	257
Lane Group Flow (vph)	319	1115	0	11	694	33	23	18	0	101	103	275
Confl. Peds. (#/hr)									15			23
Confl. Bikes (#/hr)												1
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		8	8		4	4	5
Permitted Phases						6						4
Actuated Green, G (s)	24.4	51.0		1.0	26.8	26.8	22.4	22.4		25.6	25.6	50.0
Effective Green, g (s)	24.4	51.0		1.0	26.8	26.8	22.4	22.4		25.6	25.6	50.0
Actuated g/C Ratio	0.20	0.42		0.01	0.22	0.22	0.19	0.19		0.21	0.21	0.42
Clearance Time (s)	4.6	5.4		4.6	6.2	6.2	4.6	4.6		5.4	5.4	4.6
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	3.0	3.0		3.0	3.0	2.0
Lane Grp Cap (vph)	345	1530		14	804	402	317	336		362	384	750
v/s Ratio Prot	c0.19	0.31		0.01	c0.19		c0.01	0.01		0.06	0.06	c0.07
v/s Ratio Perm						0.02						0.08
v/c Ratio	0.92	0.73		0.79	0.86	0.08	0.07	0.05		0.28	0.27	0.37
Uniform Delay, d1	46.9	28.7		59.4	44.8	36.9	40.2	40.1		39.5	39.4	24.1
Progression Factor	1.13	0.34		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	15.6	1.3		123.8	11.8	0.4	0.4	0.3		1.9	1.7	0.1
Delay (s)	68.4	11.0		183.2	56.7	37.3	40.7	40.4		41.4	41.1	24.2
Level of Service	E	B		F	E	D	D	D		D	D	C
Approach Delay (s)		23.8			54.9			40.5			28.9	
Approach LOS		C			D			D			C	

Intersection Summary		
HCM 2000 Control Delay	34.0	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.57	
Actuated Cycle Length (s)	120.0	Sum of lost time (s) 20.8
Intersection Capacity Utilization	86.2%	ICU Level of Service E
Analysis Period (min)	15	

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	297	1033	4	10	645	139	21	9	38	188	2	495
Future Volume (veh/h)	297	1033	4	10	645	139	21	9	38	188	2	495
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	319	1111	4	11	694	97	23	10	26	203	0	463
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	336	1447	5	21	750	336	302	81	211	691	0	629
Arrive On Green	0.41	0.83	0.83	0.01	0.22	0.22	0.19	0.19	0.19	0.21	0.00	0.21
Sat Flow, veh/h	1619	3495	13	1619	3420	1530	1619	435	1132	3238	0	1462
Grp Volume(v), veh/h	319	544	571	11	694	97	23	0	36	203	0	463
Grp Sat Flow(s),veh/h/ln	1619	1710	1798	1619	1710	1530	1619	0	1567	1619	0	1462
Q Serve(g_s), s	22.8	18.0	18.0	0.8	23.8	6.3	1.4	0.0	2.3	6.3	0.0	25.6
Cycle Q Clear(g_c), s	22.8	18.0	18.0	0.8	23.8	6.3	1.4	0.0	2.3	6.3	0.0	25.6
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.72	1.00		1.00
Lane Grp Cap(c), veh/h	336	708	744	21	750	336	302	0	293	691	0	629
V/C Ratio(X)	0.95	0.77	0.77	0.53	0.93	0.29	0.08	0.00	0.12	0.29	0.00	0.74
Avail Cap(c_a), veh/h	343	708	744	67	750	336	302	0	293	691	0	629
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.21	0.21	0.21	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	34.5	7.6	7.6	58.9	45.9	39.0	40.3	0.0	40.6	39.6	0.0	29.5
Incr Delay (d2), s/veh	12.0	1.7	1.6	7.6	19.0	2.2	0.5	0.0	0.9	1.1	0.0	7.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.2	8.2	8.6	0.4	13.3	2.9	0.7	0.0	1.1	2.9	0.0	14.2
LnGrp Delay(d),s/veh	46.5	9.3	9.2	66.5	64.8	41.2	40.8	0.0	41.5	40.7	0.0	37.0
LnGrp LOS	D	A	A	E	E	D	D		D	D		D
Approach Vol, veh/h		1434			802			59			666	
Approach Delay, s/veh		17.6			62.0			41.2			38.1	
Approach LOS		B			E			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.1	55.9		31.0	29.5	32.5		27.0				
Change Period (Y+Rc), s	4.6	* 6.2		5.4	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.0	* 47		25.6	25.4	25.8		22.4				
Max Q Clear Time (g_c+I1), s	2.8	20.0		27.6	24.8	25.8		4.3				
Green Ext Time (p_c), s	0.0	18.4		0.0	0.0	0.0		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay				34.7								
HCM 2010 LOS				C								
Notes												

Timings

5: Washington Av./Washington Av. & Orange Show Rd.

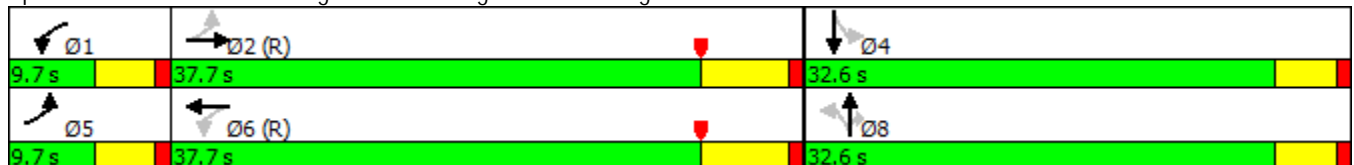


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↖	↗		↖	↗		↕
Traffic Volume (vph)	34	1254	4	751	15	2	5	1	1
Future Volume (vph)	34	1254	4	751	15	2	5	1	1
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	Perm	NA
Protected Phases	5	2	1	6		8			4
Permitted Phases	2		6		8		8	4	
Detector Phase	5	2	1	6	8	8	8	4	4
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	9.6	23.2	32.6	32.6	32.6	32.6	32.6
Total Split (s)	9.7	37.7	9.7	37.7	32.6	32.6	32.6	32.6	32.6
Total Split (%)	12.1%	47.1%	12.1%	47.1%	40.8%	40.8%	40.8%	40.8%	40.8%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6	4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None
Act Effect Green (s)	67.8	66.2	66.8	61.0		13.6	13.6		13.6
Actuated g/C Ratio	0.85	0.83	0.84	0.76		0.17	0.17		0.17
v/c Ratio	0.03	0.47	0.00	0.30		0.06	0.01		0.04
Control Delay	4.8	9.0	6.0	7.9		24.6	0.0		12.8
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Delay	4.8	9.0	6.0	7.9		24.6	0.0		12.8
LOS	A	A	A	A		C	A		B
Approach Delay		8.9		7.9		19.3			12.8
Approach LOS		A		A		B			B

Intersection Summary

Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.47
 Intersection Signal Delay: 8.6
 Intersection LOS: A
 Intersection Capacity Utilization 66.5%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 5: Washington Av./Washington Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
5: Washington Av./Washington Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	1254	11	4	751	8	15	2	5	1	1	11
Future Volume (vph)	34	1254	11	4	751	8	15	2	5	1	1	11
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2		4.6	6.2			4.6	4.6		4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85		0.88	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		1.00	
Satd. Flow (prot)	1700	3600		1700	3600			1800	1800		1800	
Flt Permitted	0.31	1.00		0.16	1.00			0.75	1.00		0.98	
Satd. Flow (perm)	1700	3600		1700	3600			1800	1800		1800	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	37	1378	12	4	825	9	16	2	5	1	1	12
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	5	0	11	0
Lane Group Flow (vph)	37	1390	0	4	833	0	0	18	0	0	3	0
Confl. Bikes (#/hr)			1									1
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)	59.0	56.0		55.0	54.0			7.6	7.6		7.6	
Effective Green, g (s)	59.0	56.0		55.0	54.0			7.6	7.6		7.6	
Actuated g/C Ratio	0.74	0.70		0.69	0.68			0.09	0.09		0.09	
Clearance Time (s)	4.6	6.2		4.6	6.2			4.6	4.6		4.6	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	1253	2520		1168	2430			171	171		171	
v/s Ratio Prot	c0.00	c0.39		0.00	0.23							
v/s Ratio Perm	0.02			0.00				0.01	0.00		0.00	
v/c Ratio	0.03	0.55		0.00	0.34			0.11	0.00		0.02	
Uniform Delay, d1	2.9	5.9		4.3	5.5			33.1	32.8		32.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.0	0.9		0.0	0.4			0.3	0.0		0.0	
Delay (s)	2.9	6.7		4.3	5.9			33.4	32.8		32.9	
Level of Service	A	A		A	A			C	C		C	
Approach Delay (s)		6.6			5.9			33.2			32.9	
Approach LOS		A			A			C			C	




















Intersection Summary

HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.4
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary
 5: Washington Av./Washington Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	1254	11	4	751	8	15	2	5	1	1	11
Future Volume (veh/h)	34	1254	11	4	751	8	15	2	5	1	1	11
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	37	1378	12	4	825	9	16	2	4	1	1	2
Adj No. of Lanes	1	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	544	2596	23	315	2487	27	153	14	84	68	32	44
Arrive On Green	0.04	0.75	0.75	0.01	0.72	0.72	0.05	0.05	0.05	0.05	0.05	0.05
Sat Flow, veh/h	1619	3474	30	1619	3466	38	1232	256	1530	206	591	797
Grp Volume(v), veh/h	37	678	712	4	407	427	18	0	4	4	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1794	1619	1710	1793	1488	0	1530	1593	0	0
Q Serve(g_s), s	0.5	13.3	13.3	0.1	7.1	7.1	0.6	0.0	0.2	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.5	13.3	13.3	0.1	7.1	7.1	0.9	0.0	0.2	0.2	0.0	0.0
Prop In Lane	1.00		0.02	1.00		0.02	0.89		1.00	0.25		0.50
Lane Grp Cap(c), veh/h	544	1278	1341	315	1227	1287	167	0	84	144	0	0
V/C Ratio(X)	0.07	0.53	0.53	0.01	0.33	0.33	0.11	0.00	0.05	0.03	0.00	0.00
Avail Cap(c_a), veh/h	591	1278	1341	410	1227	1287	600	0	535	601	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.37	0.37	0.37	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	2.8	4.2	4.2	3.8	4.2	4.2	36.1	0.0	35.8	35.8	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.6	1.5	0.0	0.3	0.3	0.3	0.0	0.2	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	6.6	6.9	0.0	3.4	3.5	0.4	0.0	0.1	0.1	0.0	0.0
LnGrp Delay(d),s/veh	2.9	5.8	5.7	3.8	4.5	4.4	36.4	0.0	36.1	35.9	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D		D	D		
Approach Vol, veh/h		1427			838			22				4
Approach Delay, s/veh		5.7			4.4			36.3				35.9
Approach LOS		A			A			D				D
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.0	66.0		9.0	7.4	63.6		9.0				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.1	31.5		28.0	5.1	31.5		28.0				
Max Q Clear Time (g_c+I1), s	2.1	15.3		2.2	2.5	9.1		2.9				
Green Ext Time (p_c), s	0.0	13.6		0.1	0.0	17.9		0.1				
Intersection Summary												
HCM 2010 Ctrl Delay			5.6									
HCM 2010 LOS			A									

Intersection

Int Delay, s/veh 4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↔	
Traffic Vol, veh/h	0	0	0	0	0	18	0	0	0	15	0	0
Future Vol, veh/h	0	0	0	0	0	18	0	0	0	15	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	54	54	54	54	54	54	54	54	54	54	54	54
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	33	0	0	0	28	0	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	33	0	17
Stage 1	-	-	17
Stage 2	-	-	0
Critical Hdwy	4.1	-	6.4
Critical Hdwy Stg 1	-	-	5.4
Critical Hdwy Stg 2	-	-	5.4
Follow-up Hdwy	2.2	-	3.5
Pot Cap-1 Maneuver	1592	0	1006
Stage 1	-	0	1011
Stage 2	-	0	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1592	-	1006
Mov Cap-2 Maneuver	-	-	1006
Stage 1	-	-	1011
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1592	-	-	-	1006
HCM Lane V/C Ratio	-	-	-	-	0.028
HCM Control Delay (s)	0	-	-	-	8.7
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Timings

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.

3/27/2017

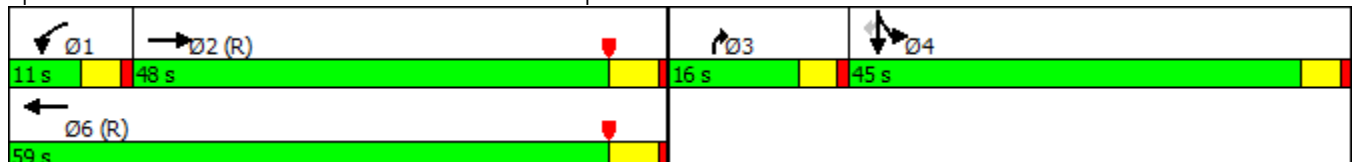


Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↖	↑↑	↗	↖	↗	↗
Traffic Volume (vph)	651	22	581	64	516	127	390
Future Volume (vph)	651	22	581	64	516	127	390
Turn Type	NA	Prot	NA	Prot	Split	NA	Perm
Protected Phases	2	1	6	3	4	4	
Permitted Phases							4
Detector Phase	2	1	6	3	4	4	4
Switch Phase							
Minimum Initial (s)	10.0	5.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	22.4	9.6	15.4	9.5	14.6	14.6	14.6
Total Split (s)	48.0	11.0	59.0	16.0	45.0	45.0	45.0
Total Split (%)	40.0%	9.2%	49.2%	13.3%	37.5%	37.5%	37.5%
Yellow Time (s)	4.4	3.6	4.4	3.5	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	4.6	5.4	4.5	4.6	4.6	4.6
Lead/Lag	Lag	Lead		Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes
Recall Mode	C-Max	None	C-Max	None	Max	Max	Max
Act Effect Green (s)	47.1	5.8	53.6	5.5	48.4	48.4	48.4
Actuated g/C Ratio	0.39	0.05	0.45	0.05	0.40	0.40	0.40
v/c Ratio	0.51	0.29	0.39	0.28	0.50	0.48	0.45
Control Delay	30.1	64.2	23.1	2.9	30.7	30.0	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.1	64.2	23.1	2.9	30.7	30.0	6.7
LOS	C	E	C	A	C	C	A
Approach Delay	30.1		24.7			21.4	
Approach LOS	C		C			C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 11 (9%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.51
 Intersection Signal Delay: 24.2
 Intersection LOS: C
 Intersection Capacity Utilization 54.5%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.






















HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑				↗	↖	↗	↗
Traffic Volume (vph)	0	651	18	22	581	0	0	0	64	516	127	390
Future Volume (vph)	0	651	18	22	581	0	0	0	64	516	127	390
Ideal Flow (vphpl)	1800	1800	1800	1700	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Lane Util. Factor		0.95		1.00	0.95				1.00	0.95	0.95	1.00
Frbp, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00		1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00				1.00	0.95	0.97	1.00
Satd. Flow (prot)		3600		1700	3600				1800	1700	1800	1800
Flt Permitted		1.00		0.95	1.00				1.00	0.95	0.97	1.00
Satd. Flow (perm)		3600		1700	3600				1800	1700	1800	1800
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	700	19	24	625	0	0	0	69	555	137	419
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	66	0	0	208
Lane Group Flow (vph)	0	718	0	24	625	0	0	0	3	344	348	211
Confl. Peds. (#/hr)			3			1						
Turn Type		NA		Prot	NA				Prot	Split	NA	Perm
Protected Phases		2		1	6				3	4	4	
Permitted Phases												4
Actuated Green, G (s)		44.3		3.8	52.7				4.4	48.4	48.4	48.4
Effective Green, g (s)		44.3		3.8	52.7				4.4	48.4	48.4	48.4
Actuated g/C Ratio		0.37		0.03	0.44				0.04	0.40	0.40	0.40
Clearance Time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Vehicle Extension (s)		3.0		2.0	3.0				3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1329		53	1581				66	685	726	726
v/s Ratio Prot		c0.20		0.01	c0.17				c0.00	c0.20	0.19	
v/s Ratio Perm												0.12
v/c Ratio		0.54		0.45	0.40				0.04	0.50	0.48	0.29
Uniform Delay, d1		29.8		57.1	22.8				55.8	26.8	26.5	24.2
Progression Factor		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		1.6		2.2	0.7				0.2	2.6	2.3	1.0
Delay (s)		31.4		59.3	23.6				56.0	29.4	28.7	25.2
Level of Service		C		E	C				E	C	C	C
Approach Delay (s)		31.4			24.9			56.0			27.6	
Approach LOS		C			C			E			C	

Intersection Summary			
HCM 2000 Control Delay	28.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.1
Intersection Capacity Utilization	54.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			


												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	651	18	22	581	0	0	0	64	516	127	390
Future Volume (veh/h)	0	651	18	22	581	0	0	0	64	516	127	390
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	0	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	700	13	24	625	0	0	0	41	346	430	417
Adj No. of Lanes	0	2	0	1	2	0	0	0	1	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1782	33	37	1984	0	0	0	0	545	606	515
Arrive On Green	0.00	0.52	0.52	0.02	0.58	0.00	0.00	0.00	0.00	0.34	0.34	0.34
Sat Flow, veh/h	0	3525	64	1619	3510	0		0		1619	1800	1530
Grp Volume(v), veh/h	0	348	365	24	625	0		0.0		346	430	417
Grp Sat Flow(s),veh/h/ln	0	1710	1789	1619	1710	0				1619	1800	1530
Q Serve(g_s), s	0.0	14.8	14.8	1.8	11.3	0.0				21.6	25.0	29.8
Cycle Q Clear(g_c), s	0.0	14.8	14.8	1.8	11.3	0.0				21.6	25.0	29.8
Prop In Lane	0.00		0.04	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	887	928	37	1984	0				545	606	515
V/C Ratio(X)	0.00	0.39	0.39	0.65	0.32	0.00				0.63	0.71	0.81
Avail Cap(c_a), veh/h	0	887	928	86	1984	0				545	606	515
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.54	0.54	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	17.5	17.5	58.1	13.0	0.0				33.6	34.7	36.3
Incr Delay (d2), s/veh	0.0	1.3	1.3	3.7	0.2	0.0				5.6	6.9	12.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.3	7.6	0.8	5.4	0.0				10.5	13.6	14.5
LnGrp Delay(d),s/veh	0.0	18.8	18.7	61.9	13.2	0.0				39.1	41.6	49.2
LnGrp LOS		B	B	E	B					D	D	D
Approach Vol, veh/h		713			649						1193	
Approach Delay, s/veh		18.7			15.0						43.5	
Approach LOS		B			B						D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	7.4	67.6		45.0		75.0						
Change Period (Y+Rc), s	4.6	5.4		4.6		5.4						
Max Green Setting (Gmax), s	6.4	42.6		40.4		53.6						
Max Q Clear Time (g_c+I1), s	3.8	16.8		31.8		13.3						
Green Ext Time (p_c), s	0.0	9.2		3.4		10.4						
Intersection Summary												
HCM 2010 Ctrl Delay				29.4								
HCM 2010 LOS				C								
Notes												

Timings

Gateway South Building 4 TIA (JN 10187)

9: Waterman Av. & Orange Show Rd./Orange Show Rd.

3/28/2017

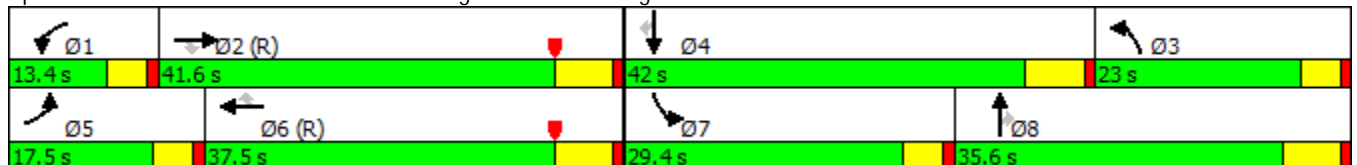


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↕	↘	↙	↕	↘	↙	↕	↘	↙	↕	↘
Traffic Volume (vph)	173	881	223	77	458	87	214	743	134	143	775	118
Future Volume (vph)	173	881	223	77	458	87	214	743	134	143	775	118
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.2	35.2	9.6	35.2	35.2	9.6	33.2	33.2	9.6	33.2	33.2
Total Split (s)	17.5	41.6	41.6	13.4	37.5	37.5	23.0	35.6	35.6	29.4	42.0	42.0
Total Split (%)	14.6%	34.7%	34.7%	11.2%	31.3%	31.3%	19.2%	29.7%	29.7%	24.5%	35.0%	35.0%
Yellow Time (s)	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Act Effect Green (s)	12.9	36.0	36.0	8.2	31.3	31.3	18.4	39.2	39.2	15.0	35.8	35.8
Actuated g/C Ratio	0.11	0.30	0.30	0.07	0.26	0.26	0.15	0.33	0.33	0.12	0.30	0.30
v/c Ratio	1.00	0.86	0.34	0.70	1.03	0.15	0.87	0.67	0.21	0.71	0.76	0.20
Control Delay	120.7	49.1	6.2	84.7	92.7	0.6	80.1	39.0	6.0	67.9	43.7	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	120.7	49.1	6.2	84.7	92.7	0.6	80.1	39.0	6.0	67.9	43.7	5.9
LOS	F	D	A	F	F	A	F	D	A	E	D	A
Approach Delay		51.3			78.8			43.0			42.7	
Approach LOS		D			E			D			D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.03
 Intersection Signal Delay: 51.1 Intersection LOS: D
 Intersection Capacity Utilization 90.0% ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/28/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑	↗	↘	↑↑	↗	↘	↑↑	↗
Traffic Volume (vph)	173	881	223	77	458	87	214	743	134	143	775	118
Future Volume (vph)	173	881	223	77	458	87	214	743	134	143	775	118
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	182	927	235	81	482	92	225	782	141	151	816	124
RTOR Reduction (vph)	0	0	158	0	0	68	0	0	95	0	0	87
Lane Group Flow (vph)	182	927	78	81	482	24	225	782	46	151	816	37
Confl. Peds. (#/hr)			1						1			
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	12.9	36.0	36.0	8.2	31.3	31.3	18.4	39.2	39.2	15.0	35.8	35.8
Effective Green, g (s)	12.9	36.0	36.0	8.2	31.3	31.3	18.4	39.2	39.2	15.0	35.8	35.8
Actuated g/C Ratio	0.11	0.30	0.30	0.07	0.26	0.26	0.15	0.33	0.33	0.12	0.30	0.30
Clearance Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	182	1080	540	116	469	469	260	1176	588	212	1074	537
v/s Ratio Prot	c0.11	0.26		0.05	c0.27		c0.13	0.22		0.09	c0.23	
v/s Ratio Perm			0.04			0.01			0.03			0.02
v/c Ratio	1.00	0.86	0.14	0.70	1.03	0.05	0.87	0.66	0.08	0.71	0.76	0.07
Uniform Delay, d1	53.5	39.6	30.7	54.7	44.4	33.2	49.6	34.8	27.9	50.4	38.2	30.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	66.7	8.9	0.6	13.8	48.8	0.2	23.9	3.0	0.3	9.0	5.1	0.2
Delay (s)	120.3	48.5	31.3	68.4	93.2	33.4	73.5	37.7	28.2	59.5	43.3	30.4
Level of Service	F	D	C	E	F	C	E	D	C	E	D	C
Approach Delay (s)		55.2			81.7			43.6			44.0	
Approach LOS		E			F			D			D	

Intersection Summary

























HCM 2000 Control Delay	53.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/28/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	173	881	223	77	458	87	214	743	134	143	775	118
Future Volume (veh/h)	173	881	223	77	458	87	214	743	134	143	775	118
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	182	927	182	81	482	57	225	782	90	151	816	86
Adj No. of Lanes	1	2	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	174	2546	1124	100	1257	1069	248	1218	545	176	1020	456
Arrive On Green	0.11	0.74	0.74	0.06	0.70	0.70	0.15	0.36	0.36	0.11	0.30	0.30
Sat Flow, veh/h	1619	3420	1511	1619	1800	1530	1619	3420	1529	1619	3420	1530
Grp Volume(v), veh/h	182	927	182	81	482	57	225	782	90	151	816	86
Grp Sat Flow(s),veh/h/ln	1619	1710	1511	1619	1800	1530	1619	1710	1529	1619	1710	1530
Q Serve(g_s), s	12.9	11.4	7.4	5.9	13.2	1.4	16.4	22.9	4.8	11.0	26.4	6.8
Cycle Q Clear(g_c), s	12.9	11.4	7.4	5.9	13.2	1.4	16.4	22.9	4.8	11.0	26.4	6.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	174	2546	1124	100	1257	1069	248	1218	545	176	1020	456
V/C Ratio(X)	1.05	0.36	0.16	0.81	0.38	0.05	0.91	0.64	0.17	0.86	0.80	0.19
Avail Cap(c_a), veh/h	174	2546	1124	119	1257	1069	248	1218	545	335	1020	456
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.89	0.89	0.89	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.5	5.4	13.8	55.6	7.4	5.7	50.0	32.2	26.4	52.6	38.8	58.0
Incr Delay (d2), s/veh	77.0	0.4	0.3	24.9	0.9	0.1	32.8	2.6	0.7	4.6	6.6	0.9
Initial Q Delay(d3),s/veh	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.5	5.4	3.2	3.3	6.9	0.6	9.6	11.2	2.1	5.1	13.4	3.0
LnGrp Delay(d),s/veh	130.6	5.7	14.1	80.5	8.3	5.8	82.8	34.8	27.1	57.2	45.4	58.9
LnGrp LOS	F	A	B	F	A	A	F	C	C	E	D	E
Approach Vol, veh/h		1291			620			1097			1053	
Approach Delay, s/veh		24.5			17.5			44.0			48.2	
Approach LOS		C			B			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.0	97.1	24.6	42.0	17.5	91.6	17.6	48.9				
Change Period (Y+Rc), s	4.6	6.2	6.2	* 6.2	4.6	6.2	4.6	6.2				
Max Green Setting (Gmax), s	8.8	35.4	18.4	* 36	12.9	31.3	24.8	29.4				
Max Q Clear Time (g_c+I1), s	7.9	13.4	18.4	28.4	14.9	15.2	13.0	24.9				
Green Ext Time (p_c), s	0.0	13.5	0.0	3.1	0.0	10.9	0.1	2.2				
Intersection Summary												
HCM 2010 Ctrl Delay			34.9									
HCM 2010 LOS			C									
Notes												

Intersection

Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↕	
Traffic Vol, veh/h	2	11	9	1088	1042	4
Future Vol, veh/h	2	11	9	1088	1042	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	75	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	2	12	10	1183	1133	4

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	1746	568	1137	0	0
Stage 1	1135	-	-	-	-
Stage 2	611	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	*79	*671	*1008	-	-
Stage 1	*633	-	-	-	-
Stage 2	*614	-	-	-	-
Platoon blocked, %		1	1	-	-
Mov Cap-1 Maneuver	*78	*671	*1008	-	-
Mov Cap-2 Maneuver	*319	-	-	-	-
Stage 1	*633	-	-	-	-
Stage 2	*608	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.4	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	* 1008	-	319	671	-	-
HCM Lane V/C Ratio	0.01	-	0.007	0.018	-	-
HCM Control Delay (s)	8.6	-	16.4	10.5	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0	0.1	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Timings
11: Waterman Av. & Driveway 2/Park Center Dr.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↕		↕	↕	↕	↕	↕	↕	↕
Traffic Volume (vph)	8	0	103	0	33	8	1126	16	8	1235
Future Volume (vph)	8	0	103	0	33	8	1126	16	8	1235
Turn Type	Perm	NA	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4		8		5	2		1	6
Permitted Phases	4		8		8	2		2	6	
Detector Phase	4	4	8	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	21.6	21.6	21.6	9.6	23.2	23.2	9.6	33.2
Total Split (s)	21.6	21.6	21.6	21.6	21.6	9.6	33.8	33.8	9.6	33.8
Total Split (%)	33.2%	33.2%	33.2%	33.2%	33.2%	14.8%	52.0%	52.0%	14.8%	52.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		4.6	4.6	4.6	6.2	6.2	4.6	6.2
Lead/Lag						Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)		11.6		11.6	11.6	46.2	44.9	44.9	48.1	44.9
Actuated g/C Ratio		0.18		0.18	0.18	0.71	0.69	0.69	0.74	0.69
v/c Ratio		0.09		0.36	0.09	0.03	0.50	0.01	0.01	0.55
Control Delay		0.4		26.0	0.4	4.8	9.1	0.0	4.4	10.2
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		0.4		26.0	0.4	4.8	9.1	0.0	4.4	10.2
LOS		A		C	A	A	A	A	A	B
Approach Delay		0.4		19.7			8.9			10.1
Approach LOS		A		B			A			B

Intersection Summary

Cycle Length: 65
 Actuated Cycle Length: 65
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.55
 Intersection Signal Delay: 10.0
 Intersection Capacity Utilization 62.5%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 11: Waterman Av. & Driveway 2/Park Center Dr.



HCM Signalized Intersection Capacity Analysis
 11: Waterman Av. & Driveway 2/Park Center Dr.

Gateway South Building 4 TIA (JN 10187)

3/27/2017
























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↕	↕	↕	↕↕	
Traffic Volume (vph)	8	0	21	103	0	33	8	1126	16	8	1235	2
Future Volume (vph)	8	0	21	103	0	33	8	1126	16	8	1235	2
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)		4.6			4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes		1.00			1.00	0.99	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.90			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.99			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1603			1800	1800	1615	3600	1800	1700	3600	
Flt Permitted		0.90			0.74	1.00	0.14	1.00	1.00	0.17	1.00	
Satd. Flow (perm)		1468			1800	1800	238	3600	1800	1700	3600	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	9	0	23	114	0	37	9	1251	18	9	1372	2
RTOR Reduction (vph)	0	27	0	0	0	32	0	0	7	0	0	0
Lane Group Flow (vph)	0	5	0	0	114	5	9	1251	11	9	1374	0
Confl. Peds. (#/hr)						1			1			1
Confl. Bikes (#/hr)									1			1
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		9.6			9.6	9.6	40.0	39.0	39.0	40.0	39.0	
Effective Green, g (s)		9.6			9.6	9.6	40.0	39.0	39.0	40.0	39.0	
Actuated g/C Ratio		0.15			0.15	0.15	0.62	0.60	0.60	0.62	0.60	
Clearance Time (s)		4.6			4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Vehicle Extension (s)		3.0			3.0	3.0	2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)		216			265	265	167	2160	1080	1166	2160	
v/s Ratio Prot							c0.00	0.35		0.00	c0.38	
v/s Ratio Perm		0.00			0.06	0.00	0.03		0.01	0.01		
v/c Ratio		0.02			0.43	0.02	0.05	0.58	0.01	0.01	0.64	
Uniform Delay, d1		23.7			25.2	23.7	5.8	8.0	5.2	5.4	8.4	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.0			1.1	0.0	0.0	1.1	0.0	0.0	1.4	
Delay (s)		23.7			26.3	23.7	5.9	9.1	5.2	5.4	9.9	
Level of Service		C			C	C	A	A	A	A	A	
Approach Delay (s)		23.7			25.7			9.0			9.8	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	10.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	15.4
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	0	21	103	0	33	8	1126	16	8	1235	2
Future Volume (veh/h)	8	0	21	103	0	33	8	1126	16	8	1235	2
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	9	0	11	114	0	24	9	1251	18	9	1372	2
Adj No. of Lanes	0	1	0	0	1	1	1	2	1	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	133	26	97	329	0	223	263	2071	907	288	2122	3
Arrive On Green	0.15	0.00	0.15	0.15	0.00	0.15	0.01	0.61	0.61	0.01	0.61	0.61
Sat Flow, veh/h	362	179	662	1497	0	1527	1619	3420	1497	1619	3504	5
Grp Volume(v), veh/h	20	0	0	114	0	24	9	1251	18	9	670	704
Grp Sat Flow(s),veh/h/ln	1203	0	0	1497	0	1527	1619	1710	1497	1619	1710	1799
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.9	0.1	14.8	0.3	0.1	16.5	16.5
Cycle Q Clear(g_c), s	4.3	0.0	0.0	4.3	0.0	0.9	0.1	14.8	0.3	0.1	16.5	16.5
Prop In Lane	0.45		0.55	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	256	0	0	329	0	223	263	2071	907	288	1035	1089
V/C Ratio(X)	0.08	0.00	0.00	0.35	0.00	0.11	0.03	0.60	0.02	0.03	0.65	0.65
Avail Cap(c_a), veh/h	426	0	0	494	0	399	369	2071	907	394	1035	1089
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.0	0.0	0.0	25.5	0.0	24.1	6.9	8.0	5.1	6.5	8.3	8.3
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.6	0.0	0.2	0.0	1.3	0.0	0.0	3.1	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	1.9	0.0	0.4	0.1	7.2	0.1	0.1	8.5	8.9
LnGrp Delay(d),s/veh	24.2	0.0	0.0	26.2	0.0	24.3	7.0	9.3	5.2	6.5	11.4	11.3
LnGrp LOS	C			C		C	A	A	A	A	B	B
Approach Vol, veh/h		20			138			1278			1383	
Approach Delay, s/veh		24.2			25.8			9.2			11.3	
Approach LOS		C			C			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.3	45.6		14.1	5.3	45.6		14.1				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.0	27.6		17.0	5.0	27.6		17.0				
Max Q Clear Time (g_c+I1), s	2.1	16.8		6.3	2.1	18.5		6.3				
Green Ext Time (p_c), s	0.0	10.1		0.5	0.0	8.6		0.5				
Intersection Summary												
HCM 2010 Ctrl Delay				11.2								
HCM 2010 LOS				B								

Timings
12: Waterman Av./Waterman Av. & Hospitality Ln.

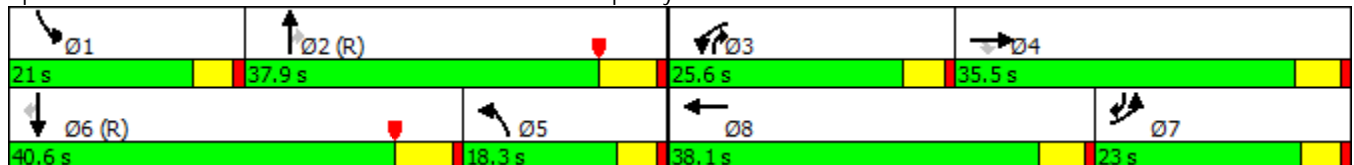


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗	↗	↗	↘	↗	↘
Traffic Volume (vph)	173	394	571	402	463	272	462	708	206	999	153
Future Volume (vph)	173	394	571	402	463	272	462	708	206	999	153
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8	5	2	3	1	6	7
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	3	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	15.1	15.1	9.6	38.1	9.6	36.2	9.6	9.6	36.2	9.6
Total Split (s)	23.0	35.5	35.5	25.6	38.1	18.3	37.9	25.6	21.0	40.6	23.0
Total Split (%)	19.2%	29.6%	29.6%	21.3%	31.8%	15.3%	31.6%	21.3%	17.5%	33.8%	19.2%
Yellow Time (s)	3.6	4.1	4.1	3.6	4.1	3.6	5.2	3.6	3.6	5.2	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	5.1	4.6	5.1	4.6	6.2	4.6	4.6	6.2	4.6
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effect Green (s)	20.8	27.2	27.2	19.4	25.9	13.7	35.3	61.0	17.5	39.2	66.1
Actuated g/C Ratio	0.17	0.23	0.23	0.16	0.22	0.11	0.29	0.51	0.15	0.33	0.55
v/c Ratio	0.63	0.78	0.55	0.83	0.77	0.79	0.46	0.39	0.88	0.60	0.16
Control Delay	56.2	42.8	15.8	64.6	51.4	68.2	37.4	13.3	84.6	36.6	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.2	42.8	15.8	64.6	51.4	68.2	37.4	13.3	84.6	36.6	5.3
LOS	E	D	B	E	D	E	D	B	F	D	A
Approach Delay		37.6			56.9		31.4			40.4	
Approach LOS		D			E		C			D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 22 (18%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 105
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 40.4
 Intersection LOS: D
 Intersection Capacity Utilization 86.4%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 12: Waterman Av./Waterman Av. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
 12: Waterman Av./Waterman Av. & Hospitality Ln.
























Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	173	394	571	402	463	108	272	462	708	206	999	153
Future Volume (vph)	173	394	571	402	463	108	272	462	708	206	999	153
Ideal Flow (vphp)	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Lane Util. Factor	1.00	0.91	0.91	0.97	0.95		0.97	0.95	0.88	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.94	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Flt Permitted	1.00	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	184	419	607	428	493	115	289	491	753	219	1063	163
RTOR Reduction (vph)	0	87	175	0	18	0	0	0	121	0	0	59
Lane Group Flow (vph)	184	617	147	428	590	0	289	491	632	219	1063	104
Confl. Peds. (#/hr)						7			5			13
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4						2			6
Actuated Green, G (s)	20.8	27.3	27.3	19.4	25.9		13.7	35.3	54.7	17.5	39.1	59.9
Effective Green, g (s)	20.8	27.3	27.3	19.4	25.9		13.7	35.3	54.7	17.5	39.1	59.9
Actuated g/C Ratio	0.17	0.23	0.23	0.16	0.22		0.11	0.29	0.46	0.15	0.33	0.50
Clearance Time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	4.0	2.0	2.0	4.0	2.0
Lane Grp Cap (vph)	294	819	409	517	777		365	1059	1641	247	1759	967
v/s Ratio Prot	0.11	c0.17		0.13	c0.16		c0.09	0.14	0.06	c0.13	c0.20	0.02
v/s Ratio Perm			0.08						0.11			0.04
v/c Ratio	0.63	0.75	0.36	0.83	0.76		0.79	0.46	0.39	0.89	0.60	0.11
Uniform Delay, d1	46.0	43.2	39.0	48.7	44.1		51.8	34.6	21.6	50.3	34.0	15.9
Progression Factor	1.00	1.00	1.00	1.05	1.07		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.0	4.0	0.5	9.6	4.1		10.5	1.5	0.1	28.6	1.5	0.0
Delay (s)	49.0	47.2	39.5	60.9	51.2		62.2	36.1	21.6	78.9	35.5	15.9
Level of Service	D	D	D	E	D		E	D	C	E	D	B
Approach Delay (s)		45.4			55.2			33.9			39.9	
Approach LOS		D			E			C			D	

Intersection Summary			
HCM 2000 Control Delay	42.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	86.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	173	394	571	402	463	108	272	462	708	206	999	153
Future Volume (veh/h)	173	394	571	402	463	108	272	462	708	206	999	153
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	184	387	497	428	493	100	289	491	387	219	1063	93
Adj No. of Lanes	1	1	2	2	2	0	2	2	2	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	291	426	724	475	604	122	390	1010	1221	221	1409	707
Arrive On Green	0.18	0.24	0.24	0.16	0.21	0.21	0.13	0.30	0.30	0.14	0.29	0.29
Sat Flow, veh/h	1619	1800	3060	2956	2831	571	2956	3420	2670	1619	4914	1509
Grp Volume(v), veh/h	184	387	497	428	297	296	289	491	387	219	1063	93
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	1710	1693	1478	1710	1335	1619	1638	1509
Q Serve(g_s), s	12.6	25.1	12.5	17.1	19.8	20.0	11.3	14.2	11.1	16.2	23.6	0.0
Cycle Q Clear(g_c), s	12.6	25.1	12.5	17.1	19.8	20.0	11.3	14.2	11.1	16.2	23.6	0.0
Prop In Lane	1.00		1.00	1.00		0.34	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	291	426	724	475	365	361	390	1010	1221	221	1409	707
V/C Ratio(X)	0.63	0.91	0.69	0.90	0.81	0.82	0.74	0.49	0.32	0.99	0.75	0.13
Avail Cap(c_a), veh/h	291	456	775	517	470	465	390	1010	1221	221	1409	707
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.87	0.87	0.87	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.6	44.5	20.7	49.4	44.9	45.0	50.1	34.8	20.8	51.7	39.0	18.2
Incr Delay (d2), s/veh	3.4	21.1	2.3	15.3	7.2	7.8	6.5	1.7	0.7	57.4	3.8	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.9	15.0	5.5	8.0	10.1	10.2	5.0	6.9	4.2	10.8	11.1	1.8
LnGrp Delay(d),s/veh	49.0	65.7	23.0	64.8	52.1	52.8	56.6	36.5	21.5	109.1	42.8	18.6
LnGrp LOS	D	E	C	E	D	D	E	D	C	F	D	B
Approach Vol, veh/h		1068			1021			1167			1375	
Approach Delay, s/veh		42.9			57.6			36.5			51.7	
Approach LOS		D			E			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	21.0	41.6	23.9	33.5	22.0	40.6	26.7	30.7				
Change Period (Y+Rc), s	4.6	6.2	4.6	5.1	6.2	* 6.2	5.1	* 5.1				
Max Green Setting (Gmax), s	16.4	31.7	21.0	30.4	13.7	* 34	18.4	* 33				
Max Q Clear Time (g_c+I1), s	18.2	16.2	19.1	27.1	13.3	25.6	14.6	22.0				
Green Ext Time (p_c), s	0.0	6.0	0.2	1.3	0.1	5.4	1.8	2.6				
Intersection Summary												
HCM 2010 Ctrl Delay			47.1									
HCM 2010 LOS			D									
Notes												

Intersection

Int Delay, s/veh 1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↖ ↗	↖ ↗	↖ ↗	
Traffic Vol, veh/h	0	0	357	1466	1352	705
Future Vol, veh/h	0	0	357	1466	1352	705
Conflicting Peds, #/hr	0	0	0	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	0	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	388	1593	1470	766

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	738	1473 0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	7.1	5.3 -
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.9	3.1 -
Pot Cap-1 Maneuver	0	*615	*774 -
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	1	1 -
Mov Cap-1 Maneuver	-	*614	*774 -
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	2.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	* 774	-	-	-	-
HCM Lane V/C Ratio	0.501	-	-	-	-
HCM Control Delay (s)	14.2	-	0	-	-
HCM Lane LOS	B	-	A	-	-
HCM 95th %tile Q(veh)	2.8	-	-	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations						↗		↕			↕	
Traffic Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Future Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	-	-	-	Free	-	-	-	-	-	None
Storage Length	-	-	-	-	-	0	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	1197	0	988	0	0	739	169

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	-	-	-	-	0	-	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	0	0	-	0	0	-	0
Stage 1	0	0	0	0	-	0	0	-	0
Stage 2	0	0	0	0	-	0	0	-	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBTWBLn1	SBT	SBR
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	-	0	-
HCM Lane LOS	-	A	-
HCM 95th %tile Q(veh)	-	-	-

Intersection

Int Delay, s/veh

Movement	NWL	NWR
Lane Configurations		
Traffic Vol, veh/h	0	0
Future Vol, veh/h	0	0
Conflicting Peds, #/hr	0	0
Sign Control	Stop	Stop
RT Channelized	-	-
Storage Length	-	-
Veh in Median Storage, #	0	-
Grade, %	0	-
Peak Hour Factor	96	96
Heavy Vehicles, %	0	0
Mvmt Flow	0	0

Major/Minor

Conflicting Flow All

Stage 1

Stage 2

Critical Hdwy

Critical Hdwy Stg 1

Critical Hdwy Stg 2

Follow-up Hdwy

Pot Cap-1 Maneuver

Stage 1

Stage 2

Platoon blocked, %

Mov Cap-1 Maneuver

Mov Cap-2 Maneuver

Stage 1

Stage 2

Approach

HCM Control Delay, s

HCM LOS

Minor Lane/Major Mvmt

Timings

15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.

3/27/2017

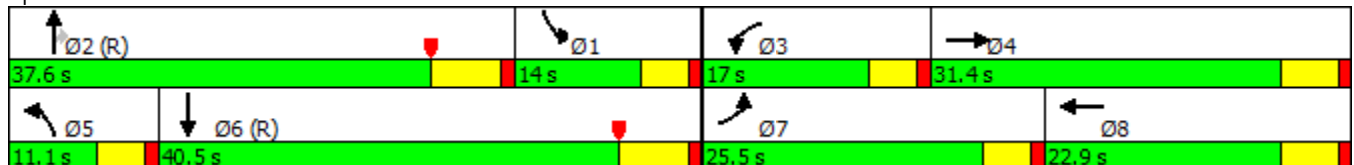


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖↖	↕↖	↖	↕↖	↖	↕↕	↖	↖	↕↖
Traffic Volume (vph)	497	674	174	363	52	911	85	207	535
Future Volume (vph)	497	674	174	363	52	911	85	207	535
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	9.6	31.4	9.6	15.4	9.6	36.2	36.2	9.6	36.2
Total Split (s)	25.5	31.4	17.0	22.9	11.1	37.6	37.6	14.0	40.5
Total Split (%)	25.5%	31.4%	17.0%	22.9%	11.1%	37.6%	37.6%	14.0%	40.5%
Yellow Time (s)	3.6	4.4	3.6	4.4	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	5.4	4.6	6.2	6.2	4.6	6.2
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)	19.4	25.7	12.2	18.5	6.2	31.9	31.9	9.4	37.1
Actuated g/C Ratio	0.19	0.26	0.12	0.18	0.06	0.32	0.32	0.09	0.37
v/c Ratio	0.85	0.92	0.90	0.80	0.53	0.84	0.13	1.38	0.57
Control Delay	52.9	51.6	85.6	43.4	63.7	40.1	0.4	242.8	25.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.9	51.6	85.6	43.4	63.7	40.1	0.4	242.8	25.9
LOS	D	D	F	D	E	D	A	F	C
Approach Delay		52.1		53.6		38.1			73.9
Approach LOS		D		D		D			E

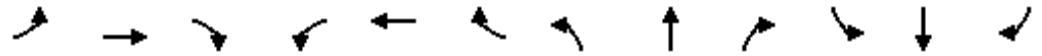
Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.38
 Intersection Signal Delay: 53.8
 Intersection LOS: D
 Intersection Capacity Utilization 92.2%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.
























HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔	↕↔		↔	↕↔	↔	↔	↕↔	
Traffic Volume (vph)	497	674	147	174	363	186	52	911	85	207	535	194
Future Volume (vph)	497	674	147	174	363	186	52	911	85	207	535	194
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.95		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	529	717	156	185	386	198	55	969	90	220	569	206
RTOR Reduction (vph)	0	19	0	0	64	0	0	0	62	0	36	0
Lane Group Flow (vph)	529	854	0	185	520	0	55	969	28	220	739	0
Confl. Peds. (#/hr)			3						1			6
Confl. Bikes (#/hr)			1						1			
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	19.4	25.7		12.2	18.5		5.2	30.9	30.9	10.4	36.1	
Effective Green, g (s)	19.4	25.7		12.2	18.5		5.2	30.9	30.9	10.4	36.1	
Actuated g/C Ratio	0.19	0.26		0.12	0.18		0.05	0.31	0.31	0.10	0.36	
Clearance Time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	620	925		207	666		88	1112	556	176	1299	
v/s Ratio Prot	c0.17	c0.24		0.11	0.14		0.03	c0.27		c0.13	0.21	
v/s Ratio Perm									0.02			
v/c Ratio	0.85	0.92		0.89	0.78		0.62	0.87	0.05	1.25	0.57	
Uniform Delay, d1	38.9	36.2		43.3	38.8		46.4	32.7	24.2	44.8	25.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	10.6	14.5		34.2	5.9		9.6	9.4	0.2	150.7	1.8	
Delay (s)	49.5	50.7		77.5	44.7		56.0	42.1	24.4	195.5	27.5	
Level of Service	D	D		E	D		E	D	C	F	C	
Approach Delay (s)		50.2			52.6			41.4			64.6	
Approach LOS		D			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	51.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.8
Intersection Capacity Utilization	92.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	497	674	147	174	363	186	52	911	85	207	535	194
Future Volume (veh/h)	497	674	147	174	363	186	52	911	85	207	535	194
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	529	717	149	185	386	157	55	969	59	220	569	145
Adj No. of Lanes	2	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	583	731	152	201	446	179	68	1074	474	964	2387	606
Arrive On Green	0.20	0.26	0.26	0.12	0.19	0.19	0.04	0.31	0.31	0.60	0.88	0.88
Sat Flow, veh/h	2956	2812	584	1619	2384	957	1619	3420	1509	1619	2701	686
Grp Volume(v), veh/h	529	436	430	185	275	268	55	969	59	220	360	354
Grp Sat Flow(s),veh/h/ln	1478	1710	1686	1619	1710	1631	1619	1710	1509	1619	1710	1677
Q Serve(g_s), s	17.5	25.3	25.3	11.3	15.6	16.0	3.4	27.1	4.0	6.4	3.1	3.1
Cycle Q Clear(g_c), s	17.5	25.3	25.3	11.3	15.6	16.0	3.4	27.1	4.0	6.4	3.1	3.1
Prop In Lane	1.00		0.35	1.00		0.59	1.00		1.00	1.00		0.41
Lane Grp Cap(c), veh/h	583	445	438	201	320	305	68	1074	474	964	1511	1482
V/C Ratio(X)	0.91	0.98	0.98	0.92	0.86	0.88	0.81	0.90	0.12	0.23	0.24	0.24
Avail Cap(c_a), veh/h	618	445	438	201	320	305	105	1074	474	964	1511	1482
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.86	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.3	36.7	36.8	43.3	39.4	39.5	47.5	32.8	49.1	9.5	0.9	0.9
Incr Delay (d2), s/veh	14.4	34.5	35.0	41.4	20.6	23.9	11.9	12.1	0.5	0.0	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	16.1	16.1	7.3	9.2	9.2	1.7	14.6	1.7	2.8	1.6	1.5
LnGrp Delay(d),s/veh	53.6	71.3	71.8	84.8	60.0	63.4	59.4	45.0	49.7	9.5	1.2	1.2
LnGrp LOS	D	E	E	F	E	E	E	D	D	A	A	A
Approach Vol, veh/h		1395			728			1083			934	
Approach Delay, s/veh		64.7			67.6			46.0			3.2	
Approach LOS		E			E			D			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	66.4	37.6	17.0	31.4	8.8	95.2	24.3	24.1				
Change Period (Y+Rc), s	6.2	* 6.2	4.6	5.4	4.6	6.2	4.6	5.4				
Max Green Setting (Gmax), s	9.4	* 31	12.4	26.0	6.5	34.3	20.9	17.5				
Max Q Clear Time (g_c+I1), s	8.4	29.1	13.3	27.3	5.4	5.1	19.5	18.0				
Green Ext Time (p_c), s	0.1	1.6	0.0	0.0	0.0	6.2	0.2	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			46.4									
HCM 2010 LOS			D									
Notes												

Timings
16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

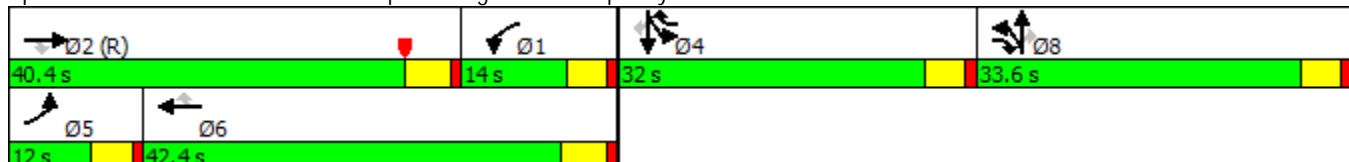


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕	↗	↖↗	↕	↗	↖	↕↖	↗	↖	↕	↗
Traffic Volume (vph)	59	415	121	236	217	411	169	620	253	46	742	272
Future Volume (vph)	59	415	121	236	217	411	169	620	253	46	742	272
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	8	1	6	4	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	39.1	33.6	9.6	39.1	22.6	33.6	33.6	33.6	22.6	22.6	22.6
Total Split (s)	12.0	40.4	33.6	14.0	42.4	32.0	33.6	33.6	33.6	32.0	32.0	32.0
Total Split (%)	10.0%	33.7%	28.0%	11.7%	35.3%	26.7%	28.0%	28.0%	28.0%	26.7%	26.7%	26.7%
Yellow Time (s)	3.6	4.1	3.6	3.6	4.1	3.6	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lead	Lead		Lag	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	C-Max	Max	None	None	Max	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	7.0	35.3	69.4	9.4	39.7	67.6	29.0	29.0	29.0	27.4	27.4	27.4
Actuated g/C Ratio	0.06	0.29	0.58	0.08	0.33	0.56	0.24	0.24	0.24	0.23	0.23	0.23
v/c Ratio	0.66	0.43	0.12	1.04	0.35	0.28	0.41	0.80	0.47	0.13	0.99	0.57
Control Delay	90.1	36.3	8.2	120.3	17.5	9.0	41.9	51.1	13.1	38.0	75.8	24.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	90.1	36.3	8.2	120.3	17.5	9.0	41.9	51.1	13.1	38.0	75.8	24.8
LOS	F	D	A	F	B	A	D	D	B	D	E	C
Approach Delay		35.9			43.5			40.5			61.1	
Approach LOS		D			D			D			E	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT, Start of Yellow
 Natural Cycle: 115
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.04
 Intersection Signal Delay: 46.6
 Intersection LOS: D
 Intersection Capacity Utilization 97.9%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)

3/30/2017



























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	415	121	236	217	411	169	620	253	46	742	272
Future Volume (vph)	59	415	121	236	217	411	169	620	253	46	742	272
Ideal Flow (vphpl)	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lane Util. Factor	1.00	0.95	1.00	0.97	0.91	0.91	0.91	0.91	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99	0.99	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600	1376	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600	1376	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	65	456	133	259	238	452	186	681	278	51	815	299
RTOR Reduction (vph)	0	0	29	0	141	33	0	0	160	0	0	115
Lane Group Flow (vph)	65	456	104	259	323	193	167	700	118	51	815	184
Confl. Peds. (#/hr)			4			7			2			
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	5.9	34.4	63.4	10.3	38.8	66.2	29.0	29.0	29.0	27.4	27.4	27.4
Effective Green, g (s)	5.9	34.4	63.4	10.3	38.8	66.2	29.0	29.0	29.0	27.4	27.4	27.4
Actuated g/C Ratio	0.05	0.29	0.53	0.09	0.32	0.55	0.24	0.24	0.24	0.23	0.23	0.23
Clearance Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	83	1032	1020	274	1164	759	410	870	435	388	822	411
v/s Ratio Prot	c0.04	c0.13	0.02	c0.08	0.09	0.06	0.10	c0.19		0.03	c0.23	
v/s Ratio Perm			0.03			0.08			0.07			0.10
v/c Ratio	0.78	0.44	0.10	0.95	0.28	0.25	0.41	0.80	0.27	0.13	0.99	0.45
Uniform Delay, d1	56.4	35.0	14.1	54.6	30.2	14.0	38.3	42.8	36.9	36.8	46.2	39.8
Progression Factor	1.16	1.02	1.26	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	30.1	1.2	0.2	39.1	0.1	0.2	3.0	7.8	1.5	0.7	29.4	3.5
Delay (s)	95.8	36.9	17.9	93.7	30.3	14.2	41.3	50.7	38.5	37.5	75.6	43.3
Level of Service	F	D	B	F	C	B	D	D	D	D	E	D
Approach Delay (s)		38.9			43.8			46.3			65.6	
Approach LOS		D			D			D			E	

Intersection Summary

HCM 2000 Control Delay	50.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.9
Intersection Capacity Utilization	97.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

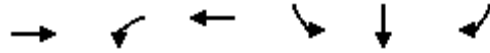
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	415	121	236	217	411	169	620	253	46	742	272
Future Volume (veh/h)	59	415	121	236	217	411	169	620	253	46	742	272
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	65	456	90	259	238	425	186	681	243	51	815	262
Adj No. of Lanes	1	2	1	2	1	2	1	2	1	1	2	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	81	1006	818	658	835	2078	391	870	369	370	781	349
Arrive On Green	0.02	0.10	0.10	0.22	0.46	0.46	0.24	0.24	0.24	0.23	0.23	0.23
Sat Flow, veh/h	1619	3420	1524	3048	1800	2974	1619	3600	1526	1619	3420	1530
Grp Volume(v), veh/h	65	456	90	259	238	425	186	681	243	51	815	262
Grp Sat Flow(s),veh/h/ln	1619	1710	1524	1524	1800	1487	1619	1800	1526	1619	1710	1530
Q Serve(g_s), s	4.8	15.1	4.3	8.7	9.8	6.2	11.8	21.2	17.2	3.0	27.4	19.1
Cycle Q Clear(g_c), s	4.8	15.1	4.3	8.7	9.8	6.2	11.8	21.2	17.2	3.0	27.4	19.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	81	1006	818	658	835	2078	391	870	369	370	781	349
V/C Ratio(X)	0.80	0.45	0.11	0.39	0.28	0.20	0.48	0.78	0.66	0.14	1.04	0.75
Avail Cap(c_a), veh/h	100	1006	818	658	835	2078	391	870	369	370	781	349
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.75	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.4	45.1	17.8	40.3	19.9	6.6	39.0	42.6	41.0	36.9	46.3	43.1
Incr Delay (d2), s/veh	19.5	1.1	0.2	0.1	0.2	0.0	4.1	7.0	8.9	0.8	44.2	13.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	7.3	2.8	3.7	4.9	4.4	5.7	11.3	8.2	1.4	17.7	9.4
LnGrp Delay(d),s/veh	77.9	46.2	18.0	40.5	20.1	6.7	43.1	49.5	49.9	37.7	90.5	56.9
LnGrp LOS	E	D	B	D	C	A	D	D	D	D	F	E
Approach Vol, veh/h		611			922			1110			1128	
Approach Delay, s/veh		45.4			19.6			48.5			80.3	
Approach LOS		D			B			D			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	31.5	40.4		32.0	10.6	61.3		33.6				
Change Period (Y+Rc), s	5.1	* 5.1		4.6	4.6	5.1		4.6				
Max Green Setting (Gmax), s	9.4	* 35		27.4	7.4	37.3		29.0				
Max Q Clear Time (g_c+I1), s	10.7	17.1		29.4	6.8	11.8		23.2				
Green Ext Time (p_c), s	0.0	3.0		0.0	0.0	3.7		2.8				
Intersection Summary												
HCM 2010 Ctrl Delay			50.5									
HCM 2010 LOS			D									
Notes												

APPENDIX 6.2:

EAP (2018) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Timings
1: I-215 SB Ramps & Auto Center Rd.

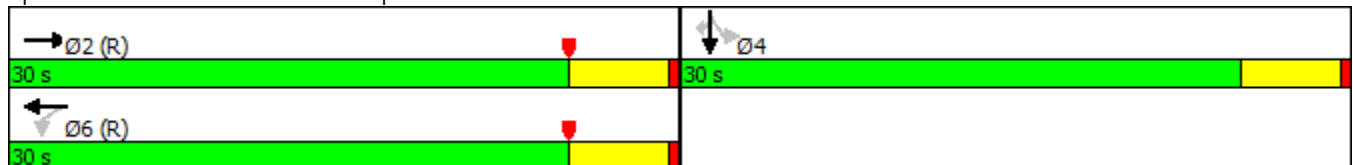


Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Configurations	↑↑		↑↑	↑	↑	↑
Traffic Volume (vph)	138	1	195	1092	67	354
Future Volume (vph)	138	1	195	1092	67	354
Turn Type	NA	Perm	NA	Perm	NA	Perm
Protected Phases	2		6		4	
Permitted Phases		6		4		4
Detector Phase	2	6	6	4	4	4
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	30.0	22.5	22.5	22.5	22.5	22.5
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0		5.0	5.0	5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	Max	Max	Max
Act Effect Green (s)	25.0		25.0	25.0	25.0	25.0
Actuated g/C Ratio	0.42		0.42	0.42	0.42	0.42
v/c Ratio	0.12		0.14	0.87	0.82	0.39
Control Delay	8.9		10.2	32.2	27.4	2.8
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	8.9		10.2	32.2	27.4	2.8
LOS	A		B	C	C	A
Approach Delay	8.9		10.2		23.5	
Approach LOS	A		B		C	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 2 (3%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.87
 Intersection Signal Delay: 20.8
 Intersection LOS: C
 Intersection Capacity Utilization 48.8%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 1: I-215 SB Ramps & Auto Center Rd.



HCM Signalized Intersection Capacity Analysis
1: I-215 SB Ramps & Auto Center Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017




















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑					↘	↙	↗
Traffic Volume (vph)	0	138	34	1	195	0	0	0	0	1092	67	354
Future Volume (vph)	0	138	34	1	195	0	0	0	0	1092	67	354
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		5.0			5.0					5.0	5.0	5.0
Lane Util. Factor		0.95			0.95					0.95	0.95	1.00
Frt		0.97			1.00					1.00	1.00	0.85
Flt Protected		1.00			1.00					0.95	0.96	1.00
Satd. Flow (prot)		3600			3600					1700	1800	1800
Flt Permitted		1.00			0.95					0.95	0.96	1.00
Satd. Flow (perm)		3600			3600					1700	1800	1800
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	147	36	1	207	0	0	0	0	1162	71	377
RTOR Reduction (vph)	0	21	0	0	0	0	0	0	0	0	0	220
Lane Group Flow (vph)	0	162	0	0	208	0	0	0	0	616	617	157
Turn Type		NA		Perm	NA					Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases				6						4		4
Actuated Green, G (s)		25.0			25.0					25.0	25.0	25.0
Effective Green, g (s)		25.0			25.0					25.0	25.0	25.0
Actuated g/C Ratio		0.42			0.42					0.42	0.42	0.42
Clearance Time (s)		5.0			5.0					5.0	5.0	5.0
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1500			1500					708	750	750
v/s Ratio Prot		0.04										
v/s Ratio Perm					0.06					c0.36	0.34	0.09
v/c Ratio		0.11			0.14					0.87	0.82	0.21
Uniform Delay, d1		10.7			10.8					16.0	15.5	11.2
Progression Factor		1.00			0.92					1.00	1.00	1.00
Incremental Delay, d2		0.1			0.2					13.8	9.9	0.6
Delay (s)		10.8			10.2					29.8	25.4	11.8
Level of Service		B			B					C	C	B
Approach Delay (s)		10.8			10.2			0.0			23.9	
Approach LOS		B			B			A			C	

Intersection Summary

HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	48.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	138	34	1	195	0	0	0	0	1092	67	354
Future Volume (veh/h)	0	138	34	1	195	0	0	0	0	1092	67	354
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1800	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	147	29	1	207	0				1213	0	272
Adj No. of Lanes	0	2	0	0	2	0				2	0	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1192	230	61	1397	0				1349	0	637
Arrive On Green	0.00	0.42	0.42	0.83	0.83	0.00				0.42	0.00	0.42
Sat Flow, veh/h	0	2951	552	2	3435	0				3238	0	1530
Grp Volume(v), veh/h	0	87	89	112	96	0				1213	0	272
Grp Sat Flow(s),veh/h/ln	0	1710	1703	1799	1556	0				1619	0	1530
Q Serve(g_s), s	0.0	1.9	1.9	0.0	0.7	0.0				21.0	0.0	7.6
Cycle Q Clear(g_c), s	0.0	1.9	1.9	0.7	0.7	0.0				21.0	0.0	7.6
Prop In Lane	0.00		0.32	0.01		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	713	709	810	648	0				1349	0	637
V/C Ratio(X)	0.00	0.12	0.13	0.14	0.15	0.00				0.90	0.00	0.43
Avail Cap(c_a), veh/h	0	713	709	810	648	0				1349	0	637
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	10.8	10.8	3.0	3.0	0.0				16.3	0.0	12.4
Incr Delay (d2), s/veh	0.0	0.3	0.4	0.4	0.5	0.0				9.8	0.0	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.9	1.0	0.4	0.4	0.0				11.1	0.0	3.5
LnGrp Delay(d),s/veh	0.0	11.1	11.1	3.3	3.5	0.0				26.1	0.0	14.5
LnGrp LOS		B	B	A	A					C		B
Approach Vol, veh/h		176			208						1485	
Approach Delay, s/veh		11.1			3.4						24.0	
Approach LOS		B			A						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		30.0		30.0		30.0						
Change Period (Y+Rc), s		5.0		5.0		5.0						
Max Green Setting (Gmax), s		25.0		25.0		25.0						
Max Q Clear Time (g_c+I1), s		3.9		23.0		2.7						
Green Ext Time (p_c), s		1.9		1.3		2.0						
Intersection Summary												
HCM 2010 Ctrl Delay			20.5									
HCM 2010 LOS			C									
Notes												

Timings

2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations	↶	↷↷	↷↷	↷	↶	↷	↷↷
Traffic Volume (vph)	71	1158	317	266	144	8	893
Future Volume (vph)	71	1158	317	266	144	8	893
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm
Protected Phases	5	2	6		8	8	
Permitted Phases				6			8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	8.0	8.0	8.0	5.0	5.0	5.0
Minimum Split (s)	8.5	39.0	13.0	13.0	10.0	10.0	10.0
Total Split (s)	9.8	39.0	29.2	29.2	21.0	21.0	21.0
Total Split (%)	16.3%	65.0%	48.7%	48.7%	35.0%	35.0%	35.0%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max
Act Effct Green (s)	6.0	34.0	28.1	28.1	16.0	16.0	16.0
Actuated g/C Ratio	0.10	0.57	0.47	0.47	0.27	0.27	0.27
v/c Ratio	0.46	0.62	0.21	0.29	0.19	0.17	0.95
Control Delay	27.9	8.9	11.6	7.5	18.3	18.1	39.9
Queue Delay	0.0	0.6	0.0	0.0	0.0	0.0	29.5
Total Delay	27.9	9.5	11.6	7.5	18.3	18.1	69.4
LOS	C	A	B	A	B	B	E
Approach Delay		10.6	9.8			62.0	
Approach LOS		B	A			E	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 1 (2%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.95
 Intersection Signal Delay: 29.2
 Intersection LOS: C
 Intersection Capacity Utilization 75.1%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.




























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↖	↗↗			
Traffic Volume (vph)	71	1158	0	0	317	266	144	8	893	0	0	0
Future Volume (vph)	71	1158	0	0	317	266	144	8	893	0	0	0
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800	1700	1800	1800	1800	1800	1800
Total Lost time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	0.88			
Frbp, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.96	1.00			
Satd. Flow (prot)	1700	3600			3600	1800	1700	1800	3600			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.96	1.00			
Satd. Flow (perm)	1700	3600			3600	1800	1700	1800	3600			
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	78	1273	0	0	348	292	158	9	981	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	162	0	0	73	0	0	0
Lane Group Flow (vph)	78	1273	0	0	348	130	84	83	908	0	0	0
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	3.8	34.0			26.7	26.7	16.0	16.0	16.0			
Effective Green, g (s)	3.8	34.0			26.7	26.7	16.0	16.0	16.0			
Actuated g/C Ratio	0.06	0.57			0.44	0.44	0.27	0.27	0.27			
Clearance Time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Vehicle Extension (s)	2.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	107	2040			1602	801	453	480	960			
v/s Ratio Prot	0.05	c0.35			0.10		0.05	0.05				
v/s Ratio Perm						0.07			c0.25			
v/c Ratio	0.73	0.62			0.22	0.16	0.19	0.17	0.95			
Uniform Delay, d1	27.6	8.7			10.2	10.0	17.0	16.9	21.6			
Progression Factor	0.85	0.89			1.11	5.21	1.00	1.00	1.00			
Incremental Delay, d2	12.8	0.9			0.3	0.4	0.9	0.8	18.5			
Delay (s)	36.3	8.7			11.6	52.2	17.9	17.7	40.1			
Level of Service	D	A			B	D	B	B	D			
Approach Delay (s)		10.3			30.1			36.9			0.0	
Approach LOS		B			C			D			A	

Intersection Summary			
HCM 2000 Control Delay	24.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 	 			
Traffic Volume (veh/h)	71	1158	0	0	317	266	144	8	893	0	0	0
Future Volume (veh/h)	71	1158	0	0	317	266	144	8	893	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1700	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	78	1273	0	0	348	210	164	0	822			
Adj No. of Lanes	1	2	0	0	2	1	2	0	2			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	98	1938	0	0	1531	685	863	0	816			
Arrive On Green	0.06	0.57	0.00	0.00	0.90	0.90	0.27	0.00	0.27			
Sat Flow, veh/h	1619	3510	0	0	3510	1530	3238	0	3060			
Grp Volume(v), veh/h	78	1273	0	0	348	210	164	0	822			
Grp Sat Flow(s),veh/h/ln	1619	1710	0	0	1710	1530	1619	0	1530			
Q Serve(g_s), s	2.9	15.4	0.0	0.0	0.8	1.2	2.3	0.0	16.0			
Cycle Q Clear(g_c), s	2.9	15.4	0.0	0.0	0.8	1.2	2.3	0.0	16.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	98	1938	0	0	1531	685	863	0	816			
V/C Ratio(X)	0.79	0.66	0.00	0.00	0.23	0.31	0.19	0.00	1.01			
Avail Cap(c_a), veh/h	170	1938	0	0	1531	685	863	0	816			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.86	0.86	1.00	0.00	1.00			
Uniform Delay (d), s/veh	27.8	9.0	0.0	0.0	1.8	1.8	17.0	0.0	22.0			
Incr Delay (d2), s/veh	5.4	1.8	0.0	0.0	0.3	1.0	0.5	0.0	33.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.4	7.5	0.0	0.0	0.4	0.6	1.1	0.0	10.5			
LnGrp Delay(d),s/veh	33.2	10.7	0.0	0.0	2.1	2.8	17.5	0.0	55.3			
LnGrp LOS	C	B			A	A	B		F			
Approach Vol, veh/h		1351			558			986				
Approach Delay, s/veh		12.0			2.3			49.0				
Approach LOS		B			A			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		39.0			7.1	31.9		21.0				
Change Period (Y+Rc), s		5.0			3.5	5.0		5.0				
Max Green Setting (Gmax), s		34.0			6.3	24.2		16.0				
Max Q Clear Time (g_c+I1), s		17.4			4.9	3.2		18.0				
Green Ext Time (p_c), s		10.5			0.0	12.3		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				22.8								
HCM 2010 LOS				C								
Notes												

Timings
3: E St. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

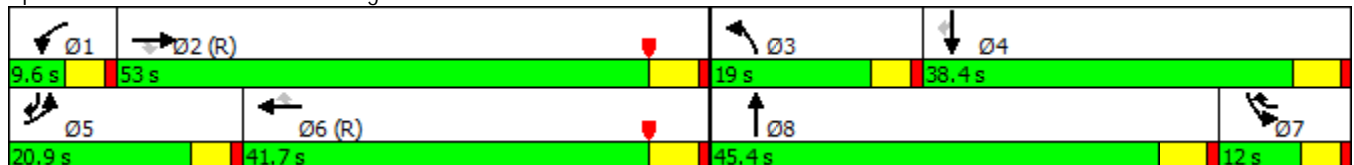


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑	↗	↔↔	↑↑	↗	↖	↑↑	↔↔	↑↑	↗
Traffic Volume (vph)	221	1296	474	61	371	64	167	173	45	129	43
Future Volume (vph)	221	1296	474	61	371	64	167	173	45	129	43
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8	7	4	5
Permitted Phases			2			6					4
Detector Phase	5	2	2	1	6	7	3	8	7	4	5
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0
Minimum Split (s)	9.6	39.4	39.4	9.6	39.4	9.6	9.6	38.4	9.6	38.4	9.6
Total Split (s)	20.9	53.0	53.0	9.6	41.7	12.0	19.0	45.4	12.0	38.4	20.9
Total Split (%)	17.4%	44.2%	44.2%	8.0%	34.8%	10.0%	15.8%	37.8%	10.0%	32.0%	17.4%
Yellow Time (s)	3.6	4.4	4.4	3.6	4.4	3.6	3.6	4.4	3.6	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4	4.6	5.4	4.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	Max	None	Max	None
Act Effect Green (s)	13.4	49.5	49.5	5.0	39.2	46.9	14.4	42.4	6.9	33.0	51.8
Actuated g/C Ratio	0.11	0.41	0.41	0.04	0.33	0.39	0.12	0.35	0.06	0.28	0.43
v/c Ratio	0.70	0.99	0.56	0.52	0.36	0.09	0.93	0.24	0.28	0.15	0.06
Control Delay	55.4	52.7	11.4	76.0	28.7	2.4	100.6	17.2	57.8	33.4	3.0
Queue Delay	0.0	34.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.4	86.7	11.9	76.0	28.7	2.4	100.6	17.2	57.8	33.4	3.0
LOS	E	F	B	E	C	A	F	B	E	C	A
Approach Delay		65.4			31.1			47.7		32.4	
Approach LOS		E			C			D		C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 92 (77%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.99
 Intersection Signal Delay: 55.2
 Intersection LOS: E
 Intersection Capacity Utilization 90.3%
 ICU Level of Service E
 Analysis Period (min) 15






























Splits and Phases: 3: E St. & Orange Show Rd.



























HCM Signalized Intersection Capacity Analysis
3: E St. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	 	 		 	 			 		 	 		
Traffic Volume (vph)	221	1296	474	61	371	64	167	173	117	45	129	43	
Future Volume (vph)	221	1296	474	61	371	64	167	173	117	45	129	43	
Ideal Flow (vphp)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800	
Total Lost time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95		0.97	0.95	1.00	
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99		1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	3200	3600	1800	3200	3600	1800	1700	3600		3200	3600	1800	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	3200	3600	1800	3200	3600	1800	1700	3600		3200	3600	1800	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	
Adj. Flow (vph)	251	1473	539	69	422	73	190	197	133	51	147	49	
RTOR Reduction (vph)	0	0	229	0	0	46	0	86	0	0	0	30	
Lane Group Flow (vph)	251	1473	310	69	422	27	190	244	0	51	147	19	
Confl. Peds. (#/hr)									2				
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov	
Protected Phases	5	2		1	6	7	3	8		7	4	5	
Permitted Phases			2			6						4	
Actuated Green, G (s)	13.4	47.7	47.7	4.0	38.3	44.2	14.4	42.4		5.9	33.9	47.3	
Effective Green, g (s)	13.4	47.7	47.7	4.0	38.3	44.2	14.4	42.4		5.9	33.9	47.3	
Actuated g/C Ratio	0.11	0.40	0.40	0.03	0.32	0.37	0.12	0.35		0.05	0.28	0.39	
Clearance Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6	
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	2.0	2.0	3.0		2.0	3.0	2.0	
Lane Grp Cap (vph)	357	1431	715	106	1149	663	204	1272		157	1017	709	
v/s Ratio Prot	c0.08	c0.41		0.02	0.12	0.00	c0.11	c0.07		c0.02	0.04	0.00	
v/s Ratio Perm			0.17			0.01						0.01	
v/c Ratio	0.70	1.03	0.43	0.65	0.37	0.04	0.93	0.19		0.32	0.14	0.03	
Uniform Delay, d1	51.4	36.1	26.3	57.3	31.5	24.3	52.3	26.9		55.1	32.2	22.3	
Progression Factor	0.95	1.01	1.27	1.11	0.88	1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2	3.2	26.8	1.2	9.8	0.9	0.0	43.5	0.3		0.4	0.3	0.0	
Delay (s)	51.8	63.3	34.6	73.5	28.7	24.3	95.8	27.3		55.6	32.5	22.3	
Level of Service	D	E	C	E	C	C	F	C		E	C	C	
Approach Delay (s)		55.2			33.6			52.3			35.2		
Approach LOS		E			C			D			D		
Intersection Summary													
HCM 2000 Control Delay			50.0									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.74										
Actuated Cycle Length (s)			120.0									Sum of lost time (s)	20.0
Intersection Capacity Utilization			90.3%									ICU Level of Service	E
Analysis Period (min)			15										
c Critical Lane Group													

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	221	1296	474	61	371	64	167	173	117	45	129	43
Future Volume (veh/h)	221	1296	474	61	371	64	167	173	117	45	129	43
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	251	1473	288	69	422	42	190	197	101	51	147	27
Adj No. of Lanes	2	2	1	2	2	1	1	2	0	2	2	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	296	1371	613	111	1157	602	183	741	364	163	940	574
Arrive On Green	0.20	0.80	0.80	0.07	0.68	0.68	0.12	0.33	0.33	0.05	0.28	0.28
Sat Flow, veh/h	2956	3420	1530	2956	3420	1530	1524	2222	1093	2956	3420	1530
Grp Volume(v), veh/h	251	1473	288	69	422	42	190	150	148	51	147	27
Grp Sat Flow(s),veh/h/ln	1478	1710	1530	1478	1710	1530	1524	1710	1605	1478	1710	1530
Q Serve(g_s), s	9.8	48.1	7.2	2.7	6.4	0.2	14.4	7.7	8.1	2.0	3.9	1.3
Cycle Q Clear(g_c), s	9.8	48.1	7.2	2.7	6.4	0.2	14.4	7.7	8.1	2.0	3.9	1.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.68	1.00		1.00
Lane Grp Cap(c), veh/h	296	1371	613	111	1157	602	183	570	535	163	941	574
V/C Ratio(X)	0.85	1.07	0.47	0.62	0.36	0.07	1.04	0.26	0.28	0.31	0.16	0.05
Avail Cap(c_a), veh/h	402	1371	613	123	1157	602	183	570	535	182	941	574
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.55	0.55	0.55	0.93	0.93	0.93	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.1	11.9	7.8	54.7	13.9	4.8	52.8	29.2	29.4	54.5	33.0	23.9
Incr Delay (d2), s/veh	5.4	41.9	1.4	4.6	0.8	0.2	77.2	1.1	1.3	0.4	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	28.9	3.1	1.2	3.1	0.3	10.0	3.8	3.8	0.8	1.9	0.6
LnGrp Delay(d),s/veh	52.5	53.8	9.3	59.3	14.7	5.0	130.1	30.3	30.7	54.9	33.3	24.0
LnGrp LOS	D	F	A	E	B	A	F	C	C	D	C	C
Approach Vol, veh/h		2012			533			488			225	
Approach Delay, s/veh		47.3			19.7			69.3			37.1	
Approach LOS		D			B			E			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.1	53.5	19.0	38.4	16.6	46.0	12.0	45.4				
Change Period (Y+Rc), s	4.6	5.4	4.6	5.4	4.6	5.4	5.4	* 5.4				
Max Green Setting (Gmax), s	5.0	47.6	14.4	33.0	16.3	36.3	7.4	* 40				
Max Q Clear Time (g_c+I1), s	4.7	50.1	16.4	5.9	11.8	8.4	4.0	10.1				
Green Ext Time (p_c), s	0.0	0.0	0.0	1.0	0.2	22.2	0.3	1.7				
Intersection Summary												
HCM 2010 Ctrl Delay			45.4									
HCM 2010 LOS			D									
Notes												

Timings
4: Arrowhead Av. & Orange Show Rd.

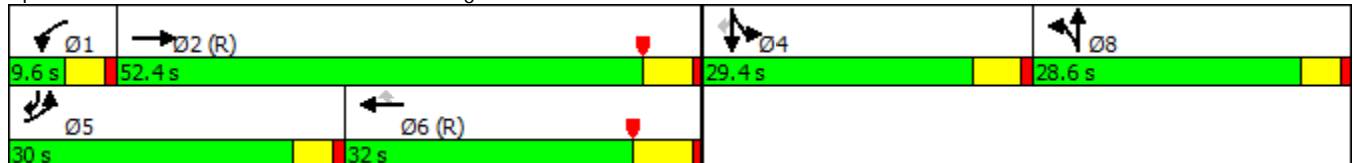


Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Configurations	↙	↕↗	↙	↕↗	↗	↗	↙	↖↗	↗
Traffic Volume (vph)	294	1070	7	323	88	3	90	11	197
Future Volume (vph)	294	1070	7	323	88	3	90	11	197
Turn Type	Prot	NA	Prot	NA	Perm	NA	Split	NA	pm+ov
Protected Phases	5	2	1	6		8	4	4	5
Permitted Phases					6				4
Detector Phase	5	2	1	6	6	8	4	4	5
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	28.4	9.6	29.2	29.2	28.6	29.4	29.4	9.6
Total Split (s)	30.0	52.4	9.6	32.0	32.0	28.6	29.4	29.4	30.0
Total Split (%)	25.0%	43.7%	8.0%	26.7%	26.7%	23.8%	24.5%	24.5%	25.0%
Yellow Time (s)	3.6	4.4	3.6	5.2	5.2	3.6	4.4	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	6.2	6.2	4.6	5.4	5.4	4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag				Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				Yes
Recall Mode	None	C-Max	None	C-Max	C-Max	Max	Max	Max	None
Act Effct Green (s)	24.8	54.7	5.0	26.4	26.4	24.0	24.0	24.0	49.6
Actuated g/C Ratio	0.21	0.46	0.04	0.22	0.22	0.20	0.20	0.20	0.41
v/c Ratio	0.95	0.75	0.11	0.46	0.20	0.02	0.17	0.16	0.26
Control Delay	87.0	35.5	59.0	43.1	2.6	26.6	41.4	41.2	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.0	35.5	59.0	43.1	2.6	26.6	41.4	41.2	2.1
LOS	F	D	E	D	A	C	D	D	A
Approach Delay		46.5		34.9		26.6		15.4	
Approach LOS		D		C		C		B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 86 (72%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.95
 Intersection Signal Delay: 39.7
 Intersection LOS: D
 Intersection Capacity Utilization 68.8%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 4: Arrowhead Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
4: Arrowhead Av. & Orange Show Rd.























Gateway South Building 4 TIA (JN 10187)

3/27/2017



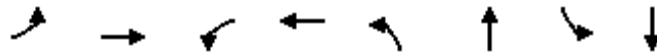
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗	↖	↗		↖	↗	↗
Traffic Volume (vph)	294	1070	18	7	323	88	0	3	5	90	11	197
Future Volume (vph)	294	1070	18	7	323	88	0	3	5	90	11	197
Ideal Flow (vphp)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	6.2	6.2		4.6		5.4	5.4	4.6
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00		0.99		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00		0.95	0.96	1.00
Satd. Flow (prot)	1700	3600		1700	3600	1800		1800		1700	1800	1800
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00		0.95	0.96	1.00
Satd. Flow (perm)	1700	3600		1700	3600	1800		1800		1700	1800	1800
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	334	1216	20	8	367	100	0	3	6	102	12	224
RTOR Reduction (vph)	0	1	0	0	0	78	0	5	0	0	0	133
Lane Group Flow (vph)	334	1235	0	8	367	22	0	4	0	57	58	91
Confl. Peds. (#/hr)									6			7
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		8	8		4	4	5
Permitted Phases						6						4
Actuated Green, G (s)	24.8	51.0		1.0	26.4	26.4		24.0		24.0	24.0	48.8
Effective Green, g (s)	24.8	51.0		1.0	26.4	26.4		24.0		24.0	24.0	48.8
Actuated g/C Ratio	0.21	0.42		0.01	0.22	0.22		0.20		0.20	0.20	0.41
Clearance Time (s)	4.6	5.4		4.6	6.2	6.2		4.6		5.4	5.4	4.6
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0		3.0		3.0	3.0	2.0
Lane Grp Cap (vph)	351	1530		14	792	396		360		340	360	732
v/s Ratio Prot	c0.20	c0.34		0.00	0.10			c0.00		c0.03	0.03	0.03
v/s Ratio Perm						0.01						0.02
v/c Ratio	0.95	0.81		0.57	0.46	0.06		0.01		0.17	0.16	0.12
Uniform Delay, d1	47.0	30.2		59.3	40.6	37.0		38.5		39.7	39.7	22.2
Progression Factor	1.45	1.23		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	19.4	1.9		30.5	1.9	0.3		0.1		1.1	1.0	0.0
Delay (s)	87.4	38.9		89.8	42.6	37.2		38.5		40.8	40.6	22.3
Level of Service	F	D		F	D	D		D		D	D	C
Approach Delay (s)		49.3			42.3			38.5			28.5	
Approach LOS		D			D			D			C	

Intersection Summary		
HCM 2000 Control Delay	44.9	HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio	0.52	
Actuated Cycle Length (s)	120.0	Sum of lost time (s) 20.8
Intersection Capacity Utilization	68.8%	ICU Level of Service C
Analysis Period (min)	15	
c Critical Lane Group		

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	294	1070	18	7	323	88	0	3	5	90	11	197
Future Volume (veh/h)	294	1070	18	7	323	88	0	3	5	90	11	197
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	334	1216	19	8	367	80	0	3	6	111	0	130
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	343	1437	22	16	735	329	324	107	213	648	0	627
Arrive On Green	0.28	0.55	0.55	0.01	0.22	0.22	0.00	0.20	0.20	0.20	0.00	0.20
Sat Flow, veh/h	1619	3447	54	1619	3420	1530	1619	533	1067	3238	0	1514
Grp Volume(v), veh/h	334	603	632	8	367	80	0	0	9	111	0	130
Grp Sat Flow(s),veh/h/ln	1619	1710	1790	1619	1710	1530	1619	0	1600	1619	0	1514
Q Serve(g_s), s	24.5	35.5	35.5	0.6	11.3	5.2	0.0	0.0	0.5	3.4	0.0	6.6
Cycle Q Clear(g_c), s	24.5	35.5	35.5	0.6	11.3	5.2	0.0	0.0	0.5	3.4	0.0	6.6
Prop In Lane	1.00		0.03	1.00		1.00	1.00		0.67	1.00		1.00
Lane Grp Cap(c), veh/h	343	713	746	16	735	329	324	0	320	648	0	627
V/C Ratio(X)	0.97	0.85	0.85	0.51	0.50	0.24	0.00	0.00	0.03	0.17	0.00	0.21
Avail Cap(c_a), veh/h	343	713	746	67	735	329	324	0	320	648	0	627
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.17	0.17	0.17	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.8	23.5	23.5	59.1	41.4	39.0	0.0	0.0	38.6	39.8	0.0	22.7
Incr Delay (d2), s/veh	14.3	2.3	2.2	9.0	2.4	1.7	0.0	0.0	0.2	0.6	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.2	17.0	17.8	0.3	5.6	2.4	0.0	0.0	0.3	1.6	0.0	2.9
LnGrp Delay(d),s/veh	57.1	25.7	25.7	68.2	43.8	40.8	0.0	0.0	38.8	40.3	0.0	23.5
LnGrp LOS	E	C	C	E	D	D			D	D		C
Approach Vol, veh/h		1569			455			9			241	
Approach Delay, s/veh		32.4			43.7			38.8			31.2	
Approach LOS		C			D			D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.8	56.2		29.4	30.0	32.0		28.6				
Change Period (Y+Rc), s	4.6	* 6.2		5.4	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.0	* 47		24.0	25.4	25.8		24.0				
Max Q Clear Time (g_c+I1), s	2.6	37.5		8.6	26.5	13.3		2.5				
Green Ext Time (p_c), s	0.0	7.5		0.7	0.0	9.4		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			34.6									
HCM 2010 LOS			C									
Notes												

Timings

5: Washington Av./Washington Av. & Orange Show Rd.

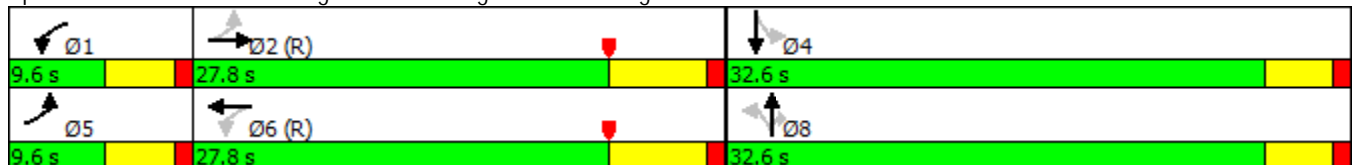


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↗	↖	↗		↖		↗
Traffic Volume (vph)	50	1087	2	397	16	3	3	1
Future Volume (vph)	50	1087	2	397	16	3	3	1
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	9.6	23.2	32.6	32.6	32.6	32.6
Total Split (s)	9.6	27.8	9.6	27.8	32.6	32.6	32.6	32.6
Total Split (%)	13.7%	39.7%	13.7%	39.7%	46.6%	46.6%	46.6%	46.6%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effect Green (s)	58.7	56.2	57.7	51.0		13.6		13.6
Actuated g/C Ratio	0.84	0.80	0.82	0.73		0.19		0.19
v/c Ratio	0.04	0.42	0.00	0.17		0.06		0.03
Control Delay	5.4	10.1	7.0	8.2		19.8		12.6
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	5.4	10.1	7.0	8.2		19.8		12.6
LOS	A	B	A	A		B		B
Approach Delay		9.9		8.2		19.8		12.6
Approach LOS		A		A		B		B

Intersection Summary

Cycle Length: 70
 Actuated Cycle Length: 70
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.42
 Intersection Signal Delay: 9.6
 Intersection LOS: A
 Intersection Capacity Utilization 58.1%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 5: Washington Av./Washington Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 5: Washington Av./Washington Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↗		↖	↑↗			↑	↗		↖↗	
Traffic Volume (vph)	50	1087	32	2	397	12	16	3	0	3	1	7
Future Volume (vph)	50	1087	32	2	397	12	16	3	0	3	1	7
Ideal Flow (vphp)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2		4.6	6.2			4.6			4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			1.00			0.91	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1700	3600		1700	3600			1800			1800	
Flt Permitted	0.47	1.00		0.21	1.00			0.76			0.93	
Satd. Flow (perm)	1700	3600		1700	3600			1800			1800	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	54	1169	34	2	427	13	17	3	0	3	1	8
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	0	0	7	0
Lane Group Flow (vph)	54	1202	0	2	439	0	0	20	0	0	5	0
Confl. Peds. (#/hr)			1									
Confl. Bikes (#/hr)			1			1						
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)	49.1	46.0		44.9	43.9			7.6			7.6	
Effective Green, g (s)	49.1	46.0		44.9	43.9			7.6			7.6	
Actuated g/C Ratio	0.70	0.66		0.64	0.63			0.11			0.11	
Clearance Time (s)	4.6	6.2		4.6	6.2			4.6			4.6	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	1192	2365		1090	2257			195			195	
v/s Ratio Prot	c0.00	c0.33		0.00	0.12							
v/s Ratio Perm	0.03			0.00				0.01			0.00	
v/c Ratio	0.05	0.51		0.00	0.19			0.10			0.02	
Uniform Delay, d1	3.3	6.2		4.7	5.5			28.1			27.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	0.8		0.0	0.2			0.2			0.1	
Delay (s)	3.3	7.0		4.7	5.7			28.4			27.9	
Level of Service	A	A		A	A			C			C	
Approach Delay (s)		6.8			5.7			28.4			27.9	
Approach LOS		A			A			C			C	




















Intersection Summary			
HCM 2000 Control Delay	6.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	15.4
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
 5: Washington Av./Washington Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	1087	32	2	397	12	16	3	0	3	1	7
Future Volume (veh/h)	50	1087	32	2	397	12	16	3	0	3	1	7
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	54	1169	34	2	427	13	17	3	0	3	1	0
Adj No. of Lanes	1	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	755	2455	71	365	2304	70	156	20	82	141	33	0
Arrive On Green	0.05	0.72	0.72	0.00	0.68	0.68	0.05	0.05	0.00	0.05	0.05	0.00
Sat Flow, veh/h	1619	3391	99	1619	3386	103	1145	367	1530	956	616	0
Grp Volume(v), veh/h	54	589	614	2	215	225	20	0	0	4	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1780	1619	1710	1779	1512	0	1530	1573	0	0
Q Serve(g_s), s	0.6	10.2	10.2	0.0	3.2	3.2	0.5	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.6	10.2	10.2	0.0	3.2	3.2	0.8	0.0	0.0	0.1	0.0	0.0
Prop In Lane	1.00		0.06	1.00		0.06	0.85		1.00	0.75		0.00
Lane Grp Cap(c), veh/h	755	1238	1289	365	1163	1210	176	0	82	174	0	0
V/C Ratio(X)	0.07	0.48	0.48	0.01	0.19	0.19	0.11	0.00	0.00	0.02	0.00	0.00
Avail Cap(c_a), veh/h	796	1238	1289	477	1163	1210	690	0	612	698	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.85	0.85	0.85	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	2.7	4.1	4.1	3.9	4.1	4.1	31.7	0.0	0.0	31.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.3	1.3	0.0	0.3	0.3	0.3	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	5.2	5.4	0.0	1.6	1.7	0.4	0.0	0.0	0.1	0.0	0.0
LnGrp Delay(d),s/veh	2.7	5.4	5.3	3.9	4.4	4.4	32.0	0.0	0.0	31.5	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C			C		
Approach Vol, veh/h		1257			442			20			4	
Approach Delay, s/veh		5.2			4.4			32.0			31.5	
Approach LOS		A			A			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.8	56.9		8.3	7.9	53.8		8.3				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.0	21.6		28.0	5.0	21.6		28.0				
Max Q Clear Time (g_c+I1), s	2.0	12.2		2.1	2.6	5.2		2.8				
Green Ext Time (p_c), s	0.0	7.2		0.1	0.0	11.1		0.1				
Intersection Summary												
HCM 2010 Ctrl Delay			5.4									
HCM 2010 LOS			A									

Intersection

Int Delay, s/veh 1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			4	4	
Traffic Vol, veh/h	10	0	0	6	12	24
Future Vol, veh/h	10	0	0	6	12	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	11	0	0	7	13	26

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	33	26	39	0	-	0
Stage 1	26	-	-	-	-	-
Stage 2	7	-	-	-	-	-
Critical Hdwy	7.1	6.2	4.1	-	-	-
Critical Hdwy Stg 1	6.1	-	-	-	-	-
Critical Hdwy Stg 2	6.1	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	979	1056	1584	-	-	-
Stage 1	997	-	-	-	-	-
Stage 2	1020	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	979	1056	1584	-	-	-
Mov Cap-2 Maneuver	979	-	-	-	-	-
Stage 1	997	-	-	-	-	-
Stage 2	1020	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1584	-	979	-	-
HCM Lane V/C Ratio	-	-	0.011	-	-
HCM Control Delay (s)	0	-	8.7	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection												
Int Delay, s/veh	5.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↔	
Traffic Vol, veh/h	0	0	0	0	0	8	0	0	0	12	0	0
Future Vol, veh/h	0	0	0	0	0	8	0	0	0	12	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	70	70	70	70	70	70	70	70	70	70	70
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	11	0	0	0	17	0	0

Major/Minor	Major1			Major2			Minor2				
Conflicting Flow All	11	0	-	-	-	0	-	-	6	6	6
Stage 1	-	-	-	-	-	-	-	-	6	6	-
Stage 2	-	-	-	-	-	-	-	-	0	0	-
Critical Hdwy	4.1	-	-	-	-	-	-	-	6.4	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	5.4	5.5	-
Follow-up Hdwy	2.2	-	-	-	-	-	-	-	3.5	4	3.3
Pot Cap-1 Maneuver	1621	-	0	0	-	-	-	-	1021	893	1083
Stage 1	-	-	0	0	-	-	-	-	1022	895	-
Stage 2	-	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1621	-	-	-	-	-	-	-	1021	0	1083
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	1021	0	-
Stage 1	-	-	-	-	-	-	-	-	1022	0	-
Stage 2	-	-	-	-	-	-	-	-	-	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1621	-	-	-	1021
HCM Lane V/C Ratio	-	-	-	-	0.017
HCM Control Delay (s)	0	-	-	-	8.6
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection

Int Delay, s/veh 7.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	0	0	8	0	10	0	12	24	0
Future Vol, veh/h	0	0	0	0	0	8	0	10	0	12	24	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	70	70	70	70	70	70	70	70	70	70	70
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	11	0	14	0	17	34	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	11	0	0	1	0	0	24	12	1	15	7	6
Stage 1	-	-	-	-	-	-	1	1	-	6	6	-
Stage 2	-	-	-	-	-	-	23	11	-	9	1	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1621	-	-	1635	-	-	993	887	1090	1006	892	1083
Stage 1	-	-	-	-	-	-	1027	899	-	1021	895	-
Stage 2	-	-	-	-	-	-	1000	890	-	1017	899	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1621	-	-	1635	-	-	964	887	1090	994	892	1083
Mov Cap-2 Maneuver	-	-	-	-	-	-	964	887	-	994	892	-
Stage 1	-	-	-	-	-	-	1027	899	-	1021	895	-
Stage 2	-	-	-	-	-	-	962	890	-	1001	899	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	9.1	9.1
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	887	1621	-	-	1635	-	-	924
HCM Lane V/C Ratio	0.016	-	-	-	-	-	-	0.056
HCM Control Delay (s)	9.1	0	-	-	0	-	-	9.1
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.2

Timings

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.

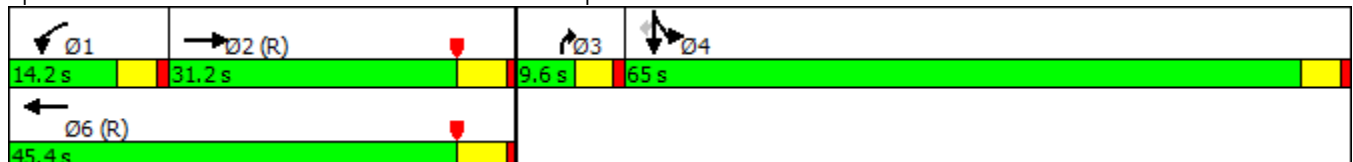


Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↖	↑↑	↗	↖	↗	↗
Traffic Volume (vph)	464	36	423	23	597	313	633
Future Volume (vph)	464	36	423	23	597	313	633
Turn Type	NA	Prot	NA	Prot	Split	NA	Perm
Protected Phases	2	1	6	3	4	4	
Permitted Phases							4
Detector Phase	2	1	6	3	4	4	4
Switch Phase							
Minimum Initial (s)	10.0	5.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	22.4	9.6	15.4	9.5	14.6	14.6	14.6
Total Split (s)	31.2	14.2	45.4	9.6	65.0	65.0	65.0
Total Split (%)	26.0%	11.8%	37.8%	8.0%	54.2%	54.2%	54.2%
Yellow Time (s)	4.4	3.6	4.4	3.5	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	4.6	5.4	4.5	4.6	4.6	4.6
Lead/Lag	Lag	Lead		Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes
Recall Mode	C-Max	None	C-Max	None	Max	Max	Max
Act Effect Green (s)	32.2	7.2	40.0	5.1	64.2	64.2	64.2
Actuated g/C Ratio	0.27	0.06	0.33	0.04	0.54	0.54	0.54
v/c Ratio	0.56	0.38	0.38	0.08	0.54	0.52	0.63
Control Delay	41.4	64.3	31.7	0.5	21.8	21.3	14.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.4	64.3	31.7	0.5	21.8	21.3	14.0
LOS	D	E	C	A	C	C	B
Approach Delay	41.4		34.3			18.4	
Approach LOS	D		C			B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.63
 Intersection Signal Delay: 25.7
 Intersection LOS: C
 Intersection Capacity Utilization 62.0%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.






















HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑				↗	↖	↑↑	↗
Traffic Volume (vph)	0	464	32	36	423	0	0	0	23	597	313	633
Future Volume (vph)	0	464	32	36	423	0	0	0	23	597	313	633
Ideal Flow (vphpl)	1800	1800	1800	1700	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Lane Util. Factor		0.95		1.00	0.95				1.00	0.95	0.95	1.00
Frbp, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Frt		0.99		1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00				1.00	0.95	0.98	1.00
Satd. Flow (prot)		3600		1700	3600				1800	1700	1800	1800
Flt Permitted		1.00		0.95	1.00				1.00	0.95	0.98	1.00
Satd. Flow (perm)		3600		1700	3600				1800	1700	1800	1800
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	504	35	39	460	0	0	0	25	649	340	688
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	24	0	0	136
Lane Group Flow (vph)	0	535	0	39	460	0	0	0	1	487	502	552
Confl. Peds. (#/hr)			6			1						
Confl. Bikes (#/hr)						2						
Turn Type		NA		Prot	NA				Prot	Split	NA	Perm
Protected Phases		2		1	6				3	4	4	
Permitted Phases												4
Actuated Green, G (s)		28.6		5.0	38.2				3.1	64.2	64.2	64.2
Effective Green, g (s)		28.6		5.0	38.2				3.1	64.2	64.2	64.2
Actuated g/C Ratio		0.24		0.04	0.32				0.03	0.54	0.54	0.54
Clearance Time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Vehicle Extension (s)		3.0		2.0	3.0				3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		858		70	1146				46	909	963	963
v/s Ratio Prot		c0.15		0.02	c0.13				c0.00	0.29	0.28	
v/s Ratio Perm												c0.31
v/c Ratio		0.62		0.56	0.40				0.01	0.54	0.52	0.57
Uniform Delay, d1		40.9		56.4	32.0				57.0	18.2	18.0	18.7
Progression Factor		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		3.4		5.4	1.0				0.1	2.3	2.0	2.5
Delay (s)		44.3		61.8	33.0				57.1	20.4	20.0	21.2
Level of Service		D		E	C				E	C	C	C
Approach Delay (s)		44.3			35.3			57.1			20.6	
Approach LOS		D			D			E			C	

Intersection Summary			
HCM 2000 Control Delay	28.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.1
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	464	32	36	423	0	0	0	23	597	313	633
Future Volume (veh/h)	0	464	32	36	423	0	0	0	23	597	313	633
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	0	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	504	24	39	460	0	0	0	12	494	556	686
Adj No. of Lanes	0	2	0	1	2	0	0	0	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1145	54	49	1414	0	0	0	0	815	906	770
Arrive On Green	0.00	0.34	0.34	0.03	0.41	0.00	0.00	0.00	0.00	0.50	0.50	0.50
Sat Flow, veh/h	0	3413	158	1619	3510	0		0		1619	1800	1530
Grp Volume(v), veh/h	0	259	269	39	460	0		0.0		494	556	686
Grp Sat Flow(s),veh/h/ln	0	1710	1770	1619	1710	0				1619	1800	1530
Q Serve(g_s), s	0.0	14.0	14.1	2.9	10.9	0.0				26.2	26.6	48.4
Cycle Q Clear(g_c), s	0.0	14.0	14.1	2.9	10.9	0.0				26.2	26.6	48.4
Prop In Lane	0.00		0.09	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	589	610	49	1414	0				815	906	770
V/C Ratio(X)	0.00	0.44	0.44	0.79	0.33	0.00				0.61	0.61	0.89
Avail Cap(c_a), veh/h	0	589	610	130	1414	0				815	906	770
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.77	0.77	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	30.4	30.4	57.8	23.9	0.0				21.3	21.4	26.8
Incr Delay (d2), s/veh	0.0	2.4	2.3	8.0	0.5	0.0				3.3	3.1	14.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.0	7.3	1.4	5.3	0.0				12.4	13.9	23.5
LnGrp Delay(d),s/veh	0.0	32.7	32.7	65.8	24.3	0.0				24.6	24.5	41.5
LnGrp LOS		C	C	E	C					C	C	D
Approach Vol, veh/h		528			499						1736	
Approach Delay, s/veh		32.7			27.6						31.3	
Approach LOS		C			C						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	8.2	46.8		65.0		55.0						
Change Period (Y+Rc), s	4.6	5.4		4.6		5.4						
Max Green Setting (Gmax), s	9.6	25.8		60.4		40.0						
Max Q Clear Time (g_c+I1), s	4.9	16.1		50.4		12.9						
Green Ext Time (p_c), s	0.0	4.0		5.5		6.4						
Intersection Summary												
HCM 2010 Ctrl Delay				30.9								
HCM 2010 LOS				C								
Notes												

Timings

9: Waterman Av. & Orange Show Rd./Orange Show Rd.

3/27/2017

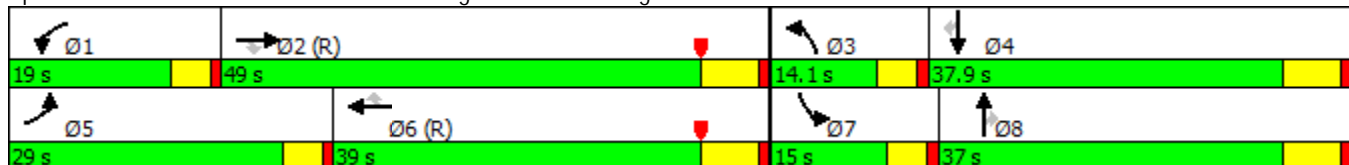


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	174	534	368	106	282	86	71	484	68	74	583	66
Future Volume (vph)	174	534	368	106	282	86	71	484	68	74	583	66
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.2	35.2	9.6	35.2	35.2	9.6	33.2	33.2	9.6	33.2	33.2
Total Split (s)	29.0	49.0	49.0	19.0	39.0	39.0	14.1	37.0	37.0	15.0	37.9	37.9
Total Split (%)	24.2%	40.8%	40.8%	15.8%	32.5%	32.5%	11.8%	30.8%	30.8%	12.5%	31.6%	31.6%
Yellow Time (s)	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Act Effect Green (s)	18.3	45.2	45.2	12.0	38.9	38.9	8.6	32.0	32.0	9.2	32.6	32.6
Actuated g/C Ratio	0.15	0.38	0.38	0.10	0.32	0.32	0.07	0.27	0.27	0.08	0.27	0.27
v/c Ratio	0.78	0.46	0.50	0.72	0.56	0.15	0.68	0.59	0.13	0.67	0.69	0.13
Control Delay	68.4	30.0	11.7	75.2	39.4	1.4	81.3	41.5	0.5	77.7	43.9	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.4	30.0	11.7	75.2	39.4	1.4	81.3	41.5	0.5	77.7	43.9	0.4
LOS	E	C	B	E	D	A	F	D	A	E	D	A
Approach Delay		30.0			40.5			41.6			43.4	
Approach LOS		C			D			D			D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 37.5
 Intersection LOS: D
 Intersection Capacity Utilization 65.8%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗↗	↘	↘	↗	↘	↘	↗↗	↘	↘	↗↗	↘
Traffic Volume (vph)	174	534	368	106	282	86	71	484	68	74	583	66
Future Volume (vph)	174	534	368	106	282	86	71	484	68	74	583	66
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	202	621	428	123	328	100	83	563	79	86	678	77
RTOR Reduction (vph)	0	0	177	0	0	68	0	0	58	0	0	56
Lane Group Flow (vph)	202	621	251	123	328	32	83	563	21	86	678	21
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	NA	4
Permitted Phases			2			6			8			4
Actuated Green, G (s)	18.3	45.2	45.2	12.0	38.9	38.9	8.6	32.0	32.0	9.2	32.6	32.6
Effective Green, g (s)	18.3	45.2	45.2	12.0	38.9	38.9	8.6	32.0	32.0	9.2	32.6	32.6
Actuated g/C Ratio	0.15	0.38	0.38	0.10	0.32	0.32	0.07	0.27	0.27	0.08	0.27	0.27
Clearance Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	259	1356	678	170	583	583	121	960	480	130	978	489
v/s Ratio Prot	c0.12	0.17		0.07	c0.18		0.05	0.16		c0.05	c0.19	
v/s Ratio Perm			0.14			0.02			0.01			0.01
v/c Ratio	0.78	0.46	0.37	0.72	0.56	0.06	0.69	0.59	0.04	0.66	0.69	0.04
Uniform Delay, d1	48.9	28.2	27.1	52.4	33.5	27.9	54.4	38.2	32.6	53.9	39.2	32.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.7	1.1	1.6	12.1	3.9	0.2	12.1	2.6	0.2	9.4	4.0	0.2
Delay (s)	61.6	29.3	28.6	64.5	37.4	28.1	66.5	40.9	32.8	63.3	43.3	32.4
Level of Service	E	C	C	E	D	C	E	D	C	E	D	C
Approach Delay (s)		34.3			41.8			42.9			44.3	
Approach LOS		C			D			D			D	

Intersection Summary

























HCM 2000 Control Delay	39.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	174	534	368	106	282	86	71	484	68	74	583	66
Future Volume (veh/h)	174	534	368	106	282	86	71	484	68	74	583	66
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	202	621	329	123	328	59	83	563	43	86	678	54
Adj No. of Lanes	1	2	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	227	1376	616	146	634	539	102	896	401	106	903	404
Arrive On Green	0.14	0.40	0.40	0.09	0.35	0.35	0.06	0.26	0.26	0.07	0.26	0.26
Sat Flow, veh/h	1619	3420	1530	1619	1800	1530	1619	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	202	621	329	123	328	59	83	563	43	86	678	54
Grp Sat Flow(s),veh/h/ln	1619	1710	1530	1619	1800	1530	1619	1710	1530	1619	1710	1530
Q Serve(g_s), s	14.7	15.9	19.6	9.0	17.3	3.1	6.1	17.5	2.6	6.3	21.8	3.2
Cycle Q Clear(g_c), s	14.7	15.9	19.6	9.0	17.3	3.1	6.1	17.5	2.6	6.3	21.8	3.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	227	1376	616	146	634	539	102	896	401	106	903	404
V/C Ratio(X)	0.89	0.45	0.53	0.84	0.52	0.11	0.81	0.63	0.11	0.81	0.75	0.13
Avail Cap(c_a), veh/h	329	1376	616	194	634	539	128	896	401	140	903	404
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.7	26.2	27.3	53.7	30.8	26.2	55.5	39.1	33.6	55.4	40.5	33.7
Incr Delay (d2), s/veh	13.3	1.0	3.0	17.1	3.0	0.4	21.4	3.3	0.5	17.7	5.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.4	7.7	8.8	4.7	9.1	1.4	3.3	8.6	1.1	3.3	11.0	1.4
LnGrp Delay(d),s/veh	63.9	27.2	30.3	70.9	33.8	26.6	76.9	42.4	34.2	73.0	46.2	34.4
LnGrp LOS	E	C	C	E	C	C	E	D	C	E	D	C
Approach Vol, veh/h		1152			510			689			818	
Approach Delay, s/veh		34.5			41.9			46.1			48.3	
Approach LOS		C			D			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.4	54.5	12.2	37.9	21.4	48.5	12.4	37.6				
Change Period (Y+Rc), s	4.6	6.2	4.6	6.2	4.6	6.2	4.6	6.2				
Max Green Setting (Gmax), s	14.4	42.8	9.5	31.7	24.4	32.8	10.4	30.8				
Max Q Clear Time (g_c+I1), s	11.0	21.6	8.1	23.8	16.7	19.3	8.3	19.5				
Green Ext Time (p_c), s	0.0	10.1	0.0	4.5	0.2	7.7	0.0	5.8				
Intersection Summary												
HCM 2010 Ctrl Delay			41.8									
HCM 2010 LOS			D									

Intersection

Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↕	↕
Traffic Vol, veh/h	3	10	1	619	1096	8
Future Vol, veh/h	3	10	1	619	1096	8
Conflicting Peds, #/hr	0	0	0	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	75	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	4	13	1	774	1370	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1766	692	1382	0	-	0
Stage 1	1377	-	-	-	-	-
Stage 2	389	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	*77	*645	774	-	-	-
Stage 1	*453	-	-	-	-	-
Stage 2	*794	-	-	-	-	-
Platoon blocked, %	-	1	1	-	-	-
Mov Cap-1 Maneuver	*77	*644	774	-	-	-
Mov Cap-2 Maneuver	*295	-	-	-	-	-
Stage 1	*452	-	-	-	-	-
Stage 2	*792	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	774	-	295	644	-	-
HCM Lane V/C Ratio	0.002	-	0.013	0.019	-	-
HCM Control Delay (s)	9.7	-	17.4	10.7	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0	0.1	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Timings
11: Waterman Av. & Driveway 2/Park Center Dr.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↕		↕	↕	↕	↕	↕	↕	↕
Traffic Volume (vph)	20	0	20	1	7	72	651	122	45	801
Future Volume (vph)	20	0	20	1	7	72	651	122	45	801
Turn Type	Perm	NA	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4		8		5	2		1	6
Permitted Phases	4		8		8	2		2	6	
Detector Phase	4	4	8	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	21.6	21.6	21.6	9.6	23.2	23.2	9.6	33.2
Total Split (s)	21.6	21.6	21.6	21.6	21.6	9.6	32.0	32.0	11.4	33.8
Total Split (%)	33.2%	33.2%	33.2%	33.2%	33.2%	14.8%	49.2%	49.2%	17.5%	52.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		4.6	4.6	4.6	6.2	6.2	4.6	6.2
Lead/Lag						Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)		11.4		11.4	11.4	47.4	44.9	44.9	49.4	41.9
Actuated g/C Ratio		0.18		0.18	0.18	0.73	0.69	0.69	0.76	0.64
v/c Ratio		0.15		0.08	0.02	0.23	0.32	0.12	0.04	0.45
Control Delay		0.9		21.7	0.1	5.6	8.9	2.6	4.1	10.1
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		0.9		21.7	0.1	5.6	8.9	2.6	4.1	10.1
LOS		A		C	A	A	A	A	A	B
Approach Delay		0.9		16.1			7.7			9.8
Approach LOS		A		B			A			A

Intersection Summary

Cycle Length: 65
 Actuated Cycle Length: 65
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.45
 Intersection Signal Delay: 8.7
 Intersection Capacity Utilization 51.6%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 11: Waterman Av. & Driveway 2/Park Center Dr.



HCM Signalized Intersection Capacity Analysis
 11: Waterman Av. & Driveway 2/Park Center Dr.






















Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↕	↕	↕	↕↕	
Traffic Volume (vph)	20	0	22	20	1	7	72	651	122	45	801	49
Future Volume (vph)	20	0	22	20	1	7	72	651	122	45	801	49
Ideal Flow (vphp)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)		4.6			4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes		1.00			1.00	1.00	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.93			1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.98			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1635			1800	1800	1615	3600	1800	1700	3600	
Flt Permitted		0.83			0.70	1.00	0.23	1.00	1.00	0.34	1.00	
Satd. Flow (perm)		1396			1800	1800	384	3600	1800	1700	3600	
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	25	0	27	25	1	9	89	804	151	56	989	60
RTOR Reduction (vph)	0	46	0	0	0	8	0	0	61	0	5	0
Lane Group Flow (vph)	0	6	0	0	26	1	89	804	90	56	1044	0
Confl. Bikes (#/hr)									2			2
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		7.4			7.4	7.4	43.1	38.8	38.8	41.3	37.9	
Effective Green, g (s)		7.4			7.4	7.4	43.1	38.8	38.8	41.3	37.9	
Actuated g/C Ratio		0.11			0.11	0.11	0.66	0.60	0.60	0.64	0.58	
Clearance Time (s)		4.6			4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Vehicle Extension (s)		3.0			3.0	3.0	2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)		158			204	204	336	2148	1074	1080	2099	
v/s Ratio Prot							c0.02	0.22		0.00	c0.29	
v/s Ratio Perm		0.00			0.01	0.00	0.16		0.05	0.03		
v/c Ratio		0.04			0.13	0.01	0.26	0.37	0.08	0.05	0.50	
Uniform Delay, d1		25.6			25.9	25.5	4.3	6.8	5.6	4.5	8.0	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.1			0.3	0.0	0.2	0.5	0.2	0.0	0.8	
Delay (s)		25.7			26.2	25.5	4.5	7.3	5.7	4.5	8.8	
Level of Service		C			C	C	A	A	A	A	A	
Approach Delay (s)		25.7			26.0			6.8			8.6	
Approach LOS		C			C			A			A	

Intersection Summary		
HCM 2000 Control Delay	8.4	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.42	A
Actuated Cycle Length (s)	65.0	Sum of lost time (s)
Intersection Capacity Utilization	51.6%	15.4
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		A

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	0	22	20	1	7	72	651	122	45	801	49
Future Volume (veh/h)	20	0	22	20	1	7	72	651	122	45	801	49
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	25	0	27	25	1	7	89	804	147	56	989	60
Adj No. of Lanes	0	1	0	0	1	1	1	2	1	1	2	0
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	146	24	95	279	9	185	416	2030	889	455	1900	115
Arrive On Green	0.12	0.00	0.12	0.12	0.12	0.12	0.06	0.59	0.59	0.05	0.58	0.58
Sat Flow, veh/h	531	202	791	1414	75	1530	1619	3420	1497	1619	3271	198
Grp Volume(v), veh/h	52	0	0	26	0	7	89	804	147	56	517	532
Grp Sat Flow(s),veh/h/ln	1523	0	0	1489	0	1530	1619	1710	1497	1619	1710	1760
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.3	1.4	8.1	2.9	0.9	11.8	11.8
Cycle Q Clear(g_c), s	1.9	0.0	0.0	0.9	0.0	0.3	1.4	8.1	2.9	0.9	11.8	11.8
Prop In Lane	0.48		0.52	0.96		1.00	1.00		1.00	1.00		0.11
Lane Grp Cap(c), veh/h	266	0	0	288	0	185	416	2030	889	455	993	1022
V/C Ratio(X)	0.20	0.00	0.00	0.09	0.00	0.04	0.21	0.40	0.17	0.12	0.52	0.52
Avail Cap(c_a), veh/h	474	0	0	488	0	400	441	2030	889	545	993	1022
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.9	0.0	0.0	25.5	0.0	25.2	5.7	7.0	6.0	5.1	8.2	8.2
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.1	0.0	0.1	0.1	0.6	0.4	0.0	1.9	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	0.4	0.0	0.1	0.6	4.0	1.3	0.4	6.0	6.2
LnGrp Delay(d),s/veh	26.3	0.0	0.0	25.6	0.0	25.3	5.8	7.6	6.4	5.1	10.1	10.1
LnGrp LOS	C			C		C	A	A	A	A	B	B
Approach Vol, veh/h		52			33			1040			1105	
Approach Delay, s/veh		26.3			25.6			7.3			9.9	
Approach LOS		C			C			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.8	44.8		12.4	8.6	44.0		12.4				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	6.8	25.8		17.0	5.0	27.6		17.0				
Max Q Clear Time (g_c+I1), s	2.9	10.1		3.9	3.4	13.8		2.9				
Green Ext Time (p_c), s	0.0	12.3		0.3	0.0	11.0		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay			9.3									
HCM 2010 LOS			A									

Timings

12: Waterman Av./Waterman Av. & Hospitality Ln.

3/27/2017

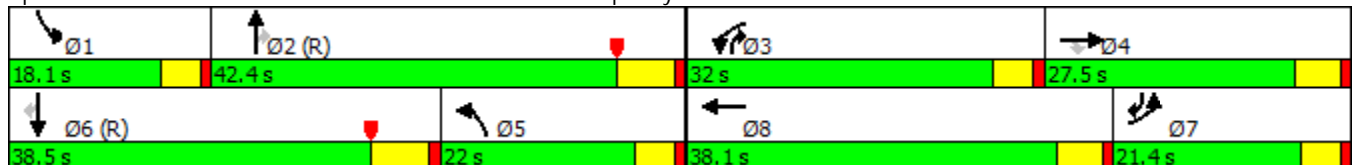


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗	↗	↗	↘	↗	↘
Traffic Volume (vph)	163	188	132	369	410	292	853	826	93	465	152
Future Volume (vph)	163	188	132	369	410	292	853	826	93	465	152
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8	5	2	3	1	6	7
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	3	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	15.1	15.1	9.6	38.1	9.6	36.2	9.6	9.6	36.2	9.6
Total Split (s)	21.4	27.5	27.5	32.0	38.1	22.0	42.4	32.0	18.1	38.5	21.4
Total Split (%)	17.8%	22.9%	22.9%	26.7%	31.8%	18.3%	35.3%	26.7%	15.1%	32.1%	17.8%
Yellow Time (s)	3.6	4.1	4.1	3.6	4.1	3.6	5.2	3.6	3.6	5.2	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	5.1	4.6	5.1	4.6	6.2	4.6	4.6	6.2	4.6
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effect Green (s)	15.8	19.7	19.7	20.1	24.0	17.4	48.9	75.2	10.8	42.3	64.3
Actuated g/C Ratio	0.13	0.16	0.16	0.17	0.20	0.14	0.41	0.63	0.09	0.35	0.54
v/c Ratio	0.78	0.40	0.24	0.74	0.73	0.68	0.63	0.36	0.65	0.26	0.16
Control Delay	74.0	43.2	1.9	56.0	48.8	56.8	32.9	4.9	71.9	29.7	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.0	43.2	1.9	56.0	48.8	56.8	32.9	4.9	71.9	29.7	5.8
LOS	E	D	A	E	D	E	C	A	E	C	A
Approach Delay		45.2			51.8		24.7			30.1	
Approach LOS		D			D		C			C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 105
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 34.0
 Intersection LOS: C
 Intersection Capacity Utilization 80.5%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 12: Waterman Av./Waterman Av. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
12: Waterman Av./Waterman Av. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)

3/27/2017


























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	188	132	369	410	92	292	853	826	93	465	152
Future Volume (vph)	163	188	132	369	410	92	292	853	826	93	465	152
Ideal Flow (vphpl)	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Lane Util. Factor	1.00	0.91	0.91	0.97	0.95		0.97	0.95	0.88	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	175	202	142	397	441	99	314	917	888	100	500	163
RTOR Reduction (vph)	0	13	88	0	18	0	0	0	225	0	0	60
Lane Group Flow (vph)	175	226	17	397	522	0	314	917	663	100	500	103
Confl. Peds. (#/hr)							9		1			3
Confl. Bikes (#/hr)							2		3			
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4						2			6
Actuated Green, G (s)	15.8	19.7	19.7	20.1	24.0		17.4	48.9	69.0	10.8	42.3	58.1
Effective Green, g (s)	15.8	19.7	19.7	20.1	24.0		17.4	48.9	69.0	10.8	42.3	58.1
Actuated g/C Ratio	0.13	0.16	0.16	0.17	0.20		0.14	0.41	0.58	0.09	0.35	0.48
Clearance Time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	4.0	2.0	2.0	4.0	2.0
Lane Grp Cap (vph)	223	591	295	536	720		464	1467	2070	153	1903	940
v/s Ratio Prot	c0.10	c0.06		0.12	c0.15		c0.10	c0.25	0.05	c0.06	0.09	0.01
v/s Ratio Perm			0.01						0.13			0.04
v/c Ratio	0.78	0.38	0.06	0.74	0.73		0.68	0.63	0.32	0.65	0.26	0.11
Uniform Delay, d1	50.5	44.7	42.3	47.5	44.9		48.6	28.3	13.3	52.8	27.7	16.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.3	0.4	0.1	4.8	3.6		3.1	2.0	0.0	7.4	0.3	0.0
Delay (s)	65.7	45.1	42.4	52.3	48.6		51.7	30.3	13.3	60.2	28.1	16.9
Level of Service	E	D	D	D	D		D	C	B	E	C	B
Approach Delay (s)		51.5			50.1			26.3			29.9	
Approach LOS		D			D			C			C	

Intersection Summary

HCM 2000 Control Delay	35.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	163	188	132	369	410	92	292	853	826	93	465	152
Future Volume (veh/h)	163	188	132	369	410	92	292	853	826	93	465	152
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	175	202	68	397	441	84	314	917	456	100	500	65
Adj No. of Lanes	1	2	1	2	2	0	2	2	2	1	3	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	203	630	268	452	566	107	647	1458	1532	122	1323	602
Arrive On Green	0.13	0.18	0.18	0.15	0.20	0.20	0.22	0.43	0.43	0.08	0.27	0.27
Sat Flow, veh/h	1619	3600	1530	2956	2857	540	2956	3420	2629	1619	4914	1525
Grp Volume(v), veh/h	175	202	68	397	263	262	314	917	456	100	500	65
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	1710	1687	1478	1710	1314	1619	1638	1525
Q Serve(g_s), s	12.7	5.9	2.9	15.8	17.4	17.7	11.1	25.2	10.6	7.3	9.9	0.0
Cycle Q Clear(g_c), s	12.7	5.9	2.9	15.8	17.4	17.7	11.1	25.2	10.6	7.3	9.9	0.0
Prop In Lane	1.00		1.00	1.00		0.32	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	203	630	268	452	339	334	647	1458	1532	122	1323	602
V/C Ratio(X)	0.86	0.32	0.25	0.88	0.77	0.78	0.49	0.63	0.30	0.82	0.38	0.11
Avail Cap(c_a), veh/h	227	672	286	675	470	464	647	1458	1532	182	1323	602
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.76	0.76	0.76	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.5	43.3	16.5	49.7	45.6	45.7	41.0	27.0	12.9	54.7	35.7	23.0
Incr Delay (d2), s/veh	23.3	0.3	0.5	4.9	4.1	4.6	0.2	2.1	0.5	10.4	0.8	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.0	2.9	1.2	6.8	8.6	8.7	4.6	12.3	3.9	3.6	4.6	1.4
LnGrp Delay(d),s/veh	74.8	43.6	17.0	54.6	49.7	50.2	41.2	29.1	13.4	65.1	36.5	23.3
LnGrp LOS	E	D	B	D	D	D	D	C	B	E	D	C
Approach Vol, veh/h		445			922			1687			665	
Approach Delay, s/veh		51.8			52.0			27.1			39.5	
Approach LOS		D			D			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.6	57.3	22.9	26.1	32.5	38.5	20.2	28.9				
Change Period (Y+Rc), s	4.6	6.2	4.6	5.1	6.2	* 6.2	5.1	* 5.1				
Max Green Setting (Gmax), s	13.5	36.2	27.4	22.4	17.4	* 32	16.8	* 33				
Max Q Clear Time (g_c+I1), s	9.3	27.2	17.8	7.9	13.1	11.9	14.7	19.7				
Green Ext Time (p_c), s	0.0	6.3	0.6	1.4	0.6	4.3	0.4	2.5				
Intersection Summary												
HCM 2010 Ctrl Delay			38.4									
HCM 2010 LOS			D									
Notes												

Intersection

Int Delay, s/veh 1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↘ ↗	↗	↗ ↗ ↘	
Traffic Vol, veh/h	0	0	289	1971	805	164
Future Vol, veh/h	0	0	289	1971	805	164
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	0	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	301	2053	839	171

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	419	839 0
Stage 1	-	-	- -
Stage 2	-	-	- -
Critical Hdwy	-	7.1	5.3 -
Critical Hdwy Stg 1	-	-	- -
Critical Hdwy Stg 2	-	-	- -
Follow-up Hdwy	-	3.9	3.1 -
Pot Cap-1 Maneuver	0	*745	*937 -
Stage 1	0	-	- -
Stage 2	0	-	- -
Platoon blocked, %	-	1	1 -
Mov Cap-1 Maneuver	-	*745	*937 -
Mov Cap-2 Maneuver	-	-	- -
Stage 1	-	-	- -
Stage 2	-	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	0	1.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	* 937	-	-	-	-
HCM Lane V/C Ratio	0.321	-	-	-	-
HCM Control Delay (s)	10.7	-	0	-	-
HCM Lane LOS	B	-	A	-	-
HCM 95th %tile Q(veh)	1.4	-	-	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations						↗		↕			↕	
Traffic Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Future Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	-	-	-	Free	-	-	-	-	-	None
Storage Length	-	-	-	-	-	0	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	1209	0	998	0	0	746	171

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	0	0	0
Stage 1	0	0	0
Stage 2	0	0	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBTWBLn1	SBT	SBR
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	-	0	-
HCM Lane LOS	-	A	-
HCM 95th %tile Q(veh)	-	-	-

Intersection

Int Delay, s/veh

Movement	NWL	NWR
Lane Configurations		
Traffic Vol, veh/h	0	0
Future Vol, veh/h	0	0
Conflicting Peds, #/hr	0	0
Sign Control	Stop	Stop
RT Channelized	-	-
Storage Length	-	-
Veh in Median Storage, #	0	-
Grade, %	0	-
Peak Hour Factor	95	95
Heavy Vehicles, %	0	0
Mvmt Flow	0	0

Major/Minor

Conflicting Flow All
Stage 1
Stage 2
Critical Hdwy
Critical Hdwy Stg 1
Critical Hdwy Stg 2
Follow-up Hdwy
Pot Cap-1 Maneuver
Stage 1
Stage 2
Platoon blocked, %
Mov Cap-1 Maneuver
Mov Cap-2 Maneuver
Stage 1
Stage 2

Approach

HCM Control Delay, s
HCM LOS

Minor Lane/Major Mvmt

Timings

15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.

3/27/2017

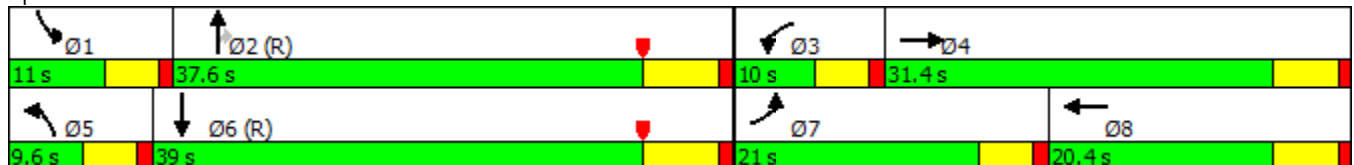


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖↗	↕	↖	↕	↖	↕	↗	↖	↕
Traffic Volume (vph)	485	378	111	228	40	783	113	75	408
Future Volume (vph)	485	378	111	228	40	783	113	75	408
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	9.6	31.4	9.6	15.4	9.6	36.2	36.2	9.6	36.2
Total Split (s)	21.0	31.4	10.0	20.4	9.6	37.6	37.6	11.0	39.0
Total Split (%)	23.3%	34.9%	11.1%	22.7%	10.7%	41.8%	41.8%	12.2%	43.3%
Yellow Time (s)	3.6	4.4	3.6	4.4	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	5.4	4.6	6.2	6.2	4.6	6.2
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)	16.0	22.9	5.4	12.4	5.7	35.7	35.7	7.1	39.1
Actuated g/C Ratio	0.18	0.25	0.06	0.14	0.06	0.40	0.40	0.08	0.43
v/c Ratio	0.89	0.62	1.14	0.63	0.40	0.57	0.14	0.58	0.38
Control Delay	55.5	24.6	172.3	33.8	51.9	24.5	0.7	59.0	16.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.5	24.6	172.3	33.8	51.9	24.5	0.7	59.0	16.7
LOS	E	C	F	C	D	C	A	E	B
Approach Delay		38.2		68.4		22.8			21.4
Approach LOS		D		E		C			C

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.14
 Intersection Signal Delay: 34.3
 Intersection LOS: C
 Intersection Capacity Utilization 73.7%
 ICU Level of Service D
 Analysis Period (min) 15























Splits and Phases: 15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.



HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔	↕↔		↔	↕↕	↔	↔	↕↔	
Traffic Volume (vph)	485	378	240	111	228	107	40	783	113	75	408	184
Future Volume (vph)	485	378	240	111	228	107	40	783	113	75	408	184
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.94		1.00	0.95		1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Flt Permitted	1.00	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	505	394	250	116	238	111	42	816	118	78	425	192
RTOR Reduction (vph)	0	118	0	0	63	0	0	0	73	0	53	0
Lane Group Flow (vph)	505	526	0	116	286	0	42	816	45	78	564	0
Confl. Peds. (#/hr)			3						1			4
Confl. Bikes (#/hr)			1						1			
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	16.0	23.0		5.4	12.4		3.6	34.7	34.7	6.1	37.2	
Effective Green, g (s)	16.0	23.0		5.4	12.4		3.6	34.7	34.7	6.1	37.2	
Actuated g/C Ratio	0.18	0.26		0.06	0.14		0.04	0.39	0.39	0.07	0.41	
Clearance Time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	568	920		102	496		68	1388	694	115	1488	
v/s Ratio Prot	c0.16	c0.15		0.07	0.08		0.02	c0.23		c0.05	0.16	
v/s Ratio Perm									0.03			
v/c Ratio	0.89	0.57		1.14	0.58		0.62	0.59	0.07	0.68	0.38	
Uniform Delay, d1	36.1	29.2		42.3	36.3		42.5	22.0	17.4	41.0	18.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	15.3	0.9		130.8	1.6		11.2	1.8	0.2	11.8	0.7	
Delay (s)	51.4	30.1		173.1	38.0		53.7	23.8	17.6	52.8	19.1	
Level of Service	D	C		F	D		D	C	B	D	B	
Approach Delay (s)		39.4			71.7			24.3			22.9	
Approach LOS		D			E			C			C	
Intersection Summary												
HCM 2000 Control Delay			36.0								HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			90.0								Sum of lost time (s)	20.8
Intersection Capacity Utilization			73.7%								ICU Level of Service	D
Analysis Period (min)			15									
c Critical Lane Group												

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	485	378	240	111	228	107	40	783	113	75	408	184
Future Volume (veh/h)	485	378	240	111	228	107	40	783	113	75	408	184
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	505	394	196	116	238	86	42	816	76	78	425	137
Adj No. of Lanes	2	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	539	580	285	97	347	122	58	1323	584	97	1047	334
Arrive On Green	0.18	0.26	0.26	0.06	0.14	0.14	0.04	0.39	0.39	0.06	0.41	0.41
Sat Flow, veh/h	2956	2212	1085	1619	2482	873	1619	3420	1510	1619	2550	814
Grp Volume(v), veh/h	505	303	287	116	162	162	42	816	76	78	284	278
Grp Sat Flow(s),veh/h/ln	1478	1710	1587	1619	1710	1646	1619	1710	1510	1619	1710	1654
Q Serve(g_s), s	15.2	14.3	14.6	5.4	8.1	8.5	2.3	17.3	2.9	4.3	10.6	10.7
Cycle Q Clear(g_c), s	15.2	14.3	14.6	5.4	8.1	8.5	2.3	17.3	2.9	4.3	10.6	10.7
Prop In Lane	1.00		0.68	1.00		0.53	1.00		1.00	1.00		0.49
Lane Grp Cap(c), veh/h	539	448	416	97	239	230	58	1323	584	97	702	679
V/C Ratio(X)	0.94	0.68	0.69	1.19	0.68	0.70	0.72	0.62	0.13	0.80	0.40	0.41
Avail Cap(c_a), veh/h	539	494	459	97	285	274	90	1323	584	115	702	679
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.83	0.83	0.83	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.3	29.8	29.9	42.3	36.8	36.9	42.9	22.2	17.8	41.8	18.7	18.8
Incr Delay (d2), s/veh	21.0	2.7	3.2	152.6	4.9	6.3	6.0	2.2	0.5	24.3	1.7	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.7	7.1	6.7	6.5	4.2	4.2	1.1	8.6	1.3	2.6	5.3	5.2
LnGrp Delay(d),s/veh	57.3	32.5	33.1	194.9	41.7	43.3	48.9	24.4	18.3	66.1	20.5	20.6
LnGrp LOS	E	C	C	F	D	D	D	C	B	E	C	C
Approach Vol, veh/h		1095			440			934			640	
Approach Delay, s/veh		44.1			82.7			25.0			26.1	
Approach LOS		D			F			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.0	41.0	10.0	29.0	7.9	43.2	21.0	18.0				
Change Period (Y+Rc), s	4.6	6.2	4.6	5.4	4.6	6.2	4.6	5.4				
Max Green Setting (Gmax), s	6.4	31.4	5.4	26.0	5.0	32.8	16.4	15.0				
Max Q Clear Time (g_c+I1), s	6.3	19.3	7.4	16.6	4.3	12.7	17.2	10.5				
Green Ext Time (p_c), s	0.0	8.1	0.0	3.6	0.0	11.5	0.0	2.1				
Intersection Summary												
HCM 2010 Ctrl Delay			40.1									
HCM 2010 LOS			D									

Timings
16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

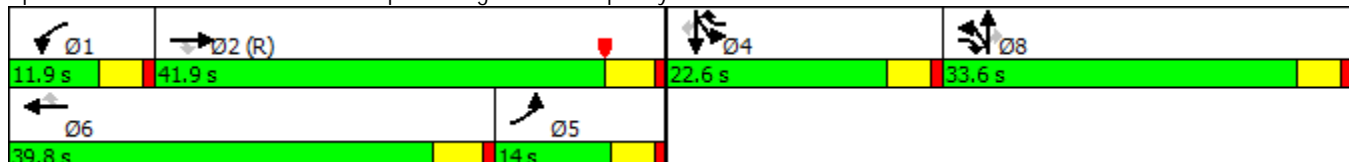


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘↗	↑↑	↗	↘	↑↑	↗	↘	↑↑	↗
Traffic Volume (vph)	82	180	59	43	104	611	349	638	187	8	377	87
Future Volume (vph)	82	180	59	43	104	611	349	638	187	8	377	87
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	8	1	6	4	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	39.1	33.6	9.6	39.1	22.6	33.6	33.6	33.6	22.6	22.6	22.6
Total Split (s)	14.0	41.9	33.6	11.9	39.8	22.6	33.6	33.6	33.6	22.6	22.6	22.6
Total Split (%)	12.7%	38.1%	30.5%	10.8%	36.2%	20.5%	30.5%	30.5%	30.5%	20.5%	20.5%	20.5%
Yellow Time (s)	3.6	4.1	3.6	3.6	4.1	3.6	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	C-Max	Max	None	None	Max	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	23.4	40.0	70.4	6.0	22.7	41.2	29.0	29.0	29.0	18.0	18.0	18.0
Actuated g/C Ratio	0.21	0.36	0.64	0.05	0.21	0.37	0.26	0.26	0.26	0.16	0.16	0.16
v/c Ratio	0.23	0.14	0.05	0.25	0.42	0.54	0.71	0.72	0.32	0.03	0.65	0.21
Control Delay	38.2	24.9	1.3	53.0	11.9	13.7	46.9	42.0	8.5	39.1	49.0	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.2	24.9	1.3	53.0	11.9	13.7	46.9	42.0	8.5	39.1	49.0	1.1
LOS	D	C	A	D	B	B	D	D	A	D	D	A
Approach Delay		24.0			15.0			38.0			40.0	
Approach LOS		C			B			D			D	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:EBT, Start of Yellow
 Natural Cycle: 105
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.72
 Intersection Signal Delay: 30.3
 Intersection LOS: C
 Intersection Capacity Utilization 78.8%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)

























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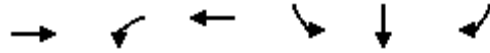
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	82	180	59	43	104	611	349	638	187	8	377	87
Future Volume (vph)	82	180	59	43	104	611	349	638	187	8	377	87
Ideal Flow (vphpl)	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lane Util. Factor	1.00	0.95	1.00	0.97	0.91	0.91	0.91	0.91	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.89	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600	1382	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600	1382	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	84	184	60	44	106	623	356	651	191	8	385	89
RTOR Reduction (vph)	0	0	23	0	250	64	0	0	123	0	0	74
Lane Group Flow (vph)	84	184	37	44	168	247	320	687	68	8	385	15
Confl. Peds. (#/hr)			2			1						
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	22.3	39.1	68.1	5.0	21.8	39.8	29.0	29.0	29.0	18.0	18.0	18.0
Effective Green, g (s)	22.3	39.1	68.1	5.0	21.8	39.8	29.0	29.0	29.0	18.0	18.0	18.0
Actuated g/C Ratio	0.20	0.36	0.62	0.05	0.20	0.36	0.26	0.26	0.26	0.16	0.16	0.16
Clearance Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	344	1279	1114	145	713	500	448	949	474	278	589	294
v/s Ratio Prot	c0.05	0.05	0.01	0.01	0.05	c0.08	0.19	c0.19		0.00	c0.11	
v/s Ratio Perm			0.01			0.10			0.04			0.01
v/c Ratio	0.24	0.14	0.03	0.30	0.24	0.49	0.71	0.72	0.14	0.03	0.65	0.05
Uniform Delay, d1	36.8	24.1	8.1	50.8	37.1	27.3	36.7	36.9	31.0	38.7	43.1	38.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.2	0.1	0.4	0.2	0.8	9.4	4.8	0.6	0.2	5.6	0.3
Delay (s)	36.9	24.3	8.2	51.2	37.3	28.0	46.1	41.6	31.6	38.8	48.6	39.1
Level of Service	D	C	A	D	D	C	D	D	C	D	D	D
Approach Delay (s)		24.6			34.3			41.2			46.7	
Approach LOS		C			C			D			D	

Intersection Summary		
HCM 2000 Control Delay	38.3	HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio	0.54	
Actuated Cycle Length (s)	110.0	Sum of lost time (s) 18.9
Intersection Capacity Utilization	78.8%	ICU Level of Service D
Analysis Period (min)	15	

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	82	180	59	43	104	611	349	638	187	8	377	87
Future Volume (veh/h)	82	180	59	43	104	611	349	638	187	8	377	87
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	84	184	43	44	106	611	336	679	151	8	385	71
Adj No. of Lanes	1	2	1	2	1	2	1	2	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	307	1256	957	102	372	1132	427	949	403	265	560	250
Arrive On Green	0.19	0.37	0.37	0.03	0.21	0.21	0.26	0.26	0.26	0.16	0.16	0.16
Sat Flow, veh/h	1619	3420	1508	3048	1800	3053	1619	3600	1530	1619	3420	1530
Grp Volume(v), veh/h	84	184	43	44	106	611	336	679	151	8	385	71
Grp Sat Flow(s),veh/h/ln	1619	1710	1508	1524	1800	1526	1619	1800	1530	1619	1710	1530
Q Serve(g_s), s	4.9	4.0	1.2	1.6	5.5	17.3	21.2	18.8	8.9	0.5	11.7	4.5
Cycle Q Clear(g_c), s	4.9	4.0	1.2	1.6	5.5	17.3	21.2	18.8	8.9	0.5	11.7	4.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	307	1256	957	102	372	1132	427	949	403	265	560	250
V/C Ratio(X)	0.27	0.15	0.04	0.43	0.28	0.54	0.79	0.72	0.37	0.03	0.69	0.28
Avail Cap(c_a), veh/h	307	1256	957	202	568	1464	427	949	403	265	560	250
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.1	23.3	7.7	52.1	36.8	27.3	37.6	36.8	33.1	38.7	43.4	40.3
Incr Delay (d2), s/veh	0.2	0.2	0.1	1.1	0.4	0.4	13.7	4.6	2.6	0.2	6.8	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	1.9	0.9	0.7	2.8	9.2	11.0	9.9	4.0	0.2	6.0	2.1
LnGrp Delay(d),s/veh	38.3	23.5	7.8	53.2	37.2	27.7	51.3	41.4	35.7	38.9	50.1	43.2
LnGrp LOS	D	C	A	D	D	C	D	D	D	D	D	D
Approach Vol, veh/h		311			761			1166			464	
Approach Delay, s/veh		25.3			30.5			43.5			48.9	
Approach LOS		C			C			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.3	45.5		22.6	26.0	27.8		33.6				
Change Period (Y+Rc), s	4.6	5.1		4.6	5.1	* 5.1		4.6				
Max Green Setting (Gmax), s	7.3	36.8		18.0	9.4	* 35		29.0				
Max Q Clear Time (g_c+I1), s	3.6	6.0		13.7	6.9	19.3		23.2				
Green Ext Time (p_c), s	0.0	1.3		1.1	0.3	2.9		2.9				
Intersection Summary												
HCM 2010 Ctrl Delay			38.7									
HCM 2010 LOS			D									
Notes												

Timings
1: I-215 SB Ramps & Auto Center Rd.

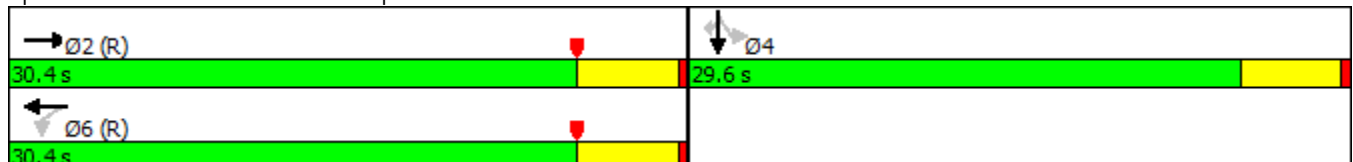


Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Configurations	↑↑		↑↑	↑	↑	↑
Traffic Volume (vph)	452	8	329	583	104	276
Future Volume (vph)	452	8	329	583	104	276
Turn Type	NA	Perm	NA	Perm	NA	Perm
Protected Phases	2		6		4	
Permitted Phases		6		4		4
Detector Phase	2	6	6	4	4	4
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	30.0	22.5	22.5	22.5	22.5	22.5
Total Split (s)	30.4	30.4	30.4	29.6	29.6	29.6
Total Split (%)	50.7%	50.7%	50.7%	49.3%	49.3%	49.3%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0		5.0	5.0	5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	Max	Max	Max
Act Effct Green (s)	25.4		25.4	24.6	24.6	24.6
Actuated g/C Ratio	0.42		0.42	0.41	0.41	0.41
v/c Ratio	0.41		0.23	0.51	0.49	0.32
Control Delay	10.6		6.3	16.3	15.9	2.8
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	10.6		6.3	16.3	15.9	2.8
LOS	B		A	B	B	A
Approach Delay	10.6		6.3		12.3	
Approach LOS	B		A		B	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 50 (83%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.51
 Intersection Signal Delay: 10.7
 Intersection Capacity Utilization 49.1%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 1: I-215 SB Ramps & Auto Center Rd.



HCM Signalized Intersection Capacity Analysis
1: I-215 SB Ramps & Auto Center Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017




















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑					↘	↙	↗
Traffic Volume (vph)	0	452	179	8	329	0	0	0	0	583	104	276
Future Volume (vph)	0	452	179	8	329	0	0	0	0	583	104	276
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		5.0			5.0					5.0	5.0	5.0
Lane Util. Factor		0.95			0.95					0.95	0.95	1.00
Frbp, ped/bikes		0.99			1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00			1.00					1.00	1.00	1.00
Frt		0.96			1.00					1.00	1.00	0.85
Flt Protected		1.00			1.00					0.95	0.97	1.00
Satd. Flow (prot)		3600			3600					1700	1800	1800
Flt Permitted		1.00			0.94					0.95	0.97	1.00
Satd. Flow (perm)		3600			3600					1700	1800	1800
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	471	186	8	343	0	0	0	0	607	108	288
RTOR Reduction (vph)	0	70	0	0	0	0	0	0	0	0	0	170
Lane Group Flow (vph)	0	587	0	0	351	0	0	0	0	352	363	118
Confl. Peds. (#/hr)			1									
Confl. Bikes (#/hr)			1									
Turn Type		NA		Perm	NA					Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases				6						4		4
Actuated Green, G (s)		25.4			25.4					24.6	24.6	24.6
Effective Green, g (s)		25.4			25.4					24.6	24.6	24.6
Actuated g/C Ratio		0.42			0.42					0.41	0.41	0.41
Clearance Time (s)		5.0			5.0					5.0	5.0	5.0
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1524			1524					697	738	738
v/s Ratio Prot		c0.16										
v/s Ratio Perm					0.10					c0.21	0.20	0.07
v/c Ratio		0.39			0.23					0.51	0.49	0.16
Uniform Delay, d1		11.9			11.1					13.2	13.1	11.2
Progression Factor		1.00			0.54					1.00	1.00	1.00
Incremental Delay, d2		0.7			0.3					2.6	2.3	0.5
Delay (s)		12.7			6.2					15.8	15.4	11.6
Level of Service		B			A					B	B	B
Approach Delay (s)		12.7			6.2			0.0			14.5	
Approach LOS		B			A			A			B	

Intersection Summary

HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	49.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	452	179	8	329	0	0	0	0	583	104	276
Future Volume (veh/h)	0	452	179	8	329	0	0	0	0	583	104	276
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1800	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	471	135	8	343	0				684	0	167
Adj No. of Lanes	0	2	0	0	2	0				2	0	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1107	315	71	1403	0				1328	0	627
Arrive On Green	0.00	0.42	0.42	0.85	0.85	0.00				0.41	0.00	0.41
Sat Flow, veh/h	0	2705	744	19	3396	0				3238	0	1530
Grp Volume(v), veh/h	0	307	299	188	163	0				684	0	167
Grp Sat Flow(s),veh/h/ln	0	1710	1649	1777	1556	0				1619	0	1530
Q Serve(g_s), s	0.0	7.6	7.7	0.0	1.2	0.0				9.5	0.0	4.3
Cycle Q Clear(g_c), s	0.0	7.6	7.7	1.2	1.2	0.0				9.5	0.0	4.3
Prop In Lane	0.00		0.45	0.04		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	724	698	815	659	0				1328	0	627
V/C Ratio(X)	0.00	0.42	0.43	0.23	0.25	0.00				0.52	0.00	0.27
Avail Cap(c_a), veh/h	0	724	698	815	659	0				1328	0	627
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	12.2	12.2	2.7	2.7	0.0				13.2	0.0	11.7
Incr Delay (d2), s/veh	0.0	1.8	1.9	0.7	0.9	0.0				1.4	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.9	3.9	0.7	0.6	0.0				4.4	0.0	2.0
LnGrp Delay(d),s/veh	0.0	14.0	14.1	3.4	3.6	0.0				14.7	0.0	12.8
LnGrp LOS		B	B	A	A					B		B
Approach Vol, veh/h		606			351						851	
Approach Delay, s/veh		14.0			3.5						14.3	
Approach LOS		B			A						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		30.4		29.6		30.4						
Change Period (Y+Rc), s		5.0		5.0		5.0						
Max Green Setting (Gmax), s		25.4		24.6		25.4						
Max Q Clear Time (g_c+I1), s		9.7		11.5		3.2						
Green Ext Time (p_c), s		5.0		2.7		5.7						
Intersection Summary												
HCM 2010 Ctrl Delay				12.1								
HCM 2010 LOS				B								
Notes												

Timings

2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.

3/27/2017



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations	↶	↷↷	↷↷	↷	↶	↷	↷↷
Traffic Volume (vph)	229	806	886	681	119	7	947
Future Volume (vph)	229	806	886	681	119	7	947
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm
Protected Phases	5	2	6		8	8	
Permitted Phases				6			8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	8.0	8.0	8.0	5.0	5.0	5.0
Minimum Split (s)	8.5	39.0	13.0	13.0	10.0	10.0	10.0
Total Split (s)	9.8	39.0	29.2	29.2	21.0	21.0	21.0
Total Split (%)	16.3%	65.0%	48.7%	48.7%	35.0%	35.0%	35.0%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max
Act Effct Green (s)	6.3	34.0	24.2	24.2	16.0	16.0	16.0
Actuated g/C Ratio	0.10	0.57	0.40	0.40	0.27	0.27	0.27
v/c Ratio	1.31	0.40	0.62	0.61	0.14	0.13	0.83
Control Delay	199.4	5.0	12.8	4.5	17.8	17.7	22.2
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	1.2
Total Delay	199.4	5.0	12.8	4.5	17.8	17.7	23.3
LOS	F	A	B	A	B	B	C
Approach Delay		48.1	9.2			22.7	
Approach LOS		D	A			C	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 43 (72%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.31
 Intersection Signal Delay: 24.1
 Intersection LOS: C
 Intersection Capacity Utilization 74.5%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.
























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↗	↗↗			
Traffic Volume (vph)	229	806	0	0	886	681	119	7	947	0	0	0
Future Volume (vph)	229	806	0	0	886	681	119	7	947	0	0	0
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800	1700	1800	1800	1800	1800	1800
Total Lost time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	0.88			
Frbp, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.96	1.00			
Satd. Flow (prot)	1700	3600			3600	1800	1700	1800	3600			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.96	1.00			
Satd. Flow (perm)	1700	3600			3600	1800	1700	1800	3600			
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	234	822	0	0	904	695	121	7	966	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	415	0	0	208	0	0	0
Lane Group Flow (vph)	234	822	0	0	904	280	64	64	758	0	0	0
Confl. Peds. (#/hr)			1									
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	6.3	34.0			24.2	24.2	16.0	16.0	16.0			
Effective Green, g (s)	6.3	34.0			24.2	24.2	16.0	16.0	16.0			
Actuated g/C Ratio	0.10	0.57			0.40	0.40	0.27	0.27	0.27			
Clearance Time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Vehicle Extension (s)	2.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	178	2040			1452	726	453	480	960			
v/s Ratio Prot	c0.14	0.23			c0.25		0.04	0.04				
v/s Ratio Perm						0.16			c0.21			
v/c Ratio	1.31	0.40			0.62	0.39	0.14	0.13	0.79			
Uniform Delay, d1	26.9	7.3			14.3	12.7	16.8	16.7	20.4			
Progression Factor	0.86	0.59			0.81	3.44	1.00	1.00	1.00			
Incremental Delay, d2	172.8	0.5			1.1	0.8	0.7	0.6	6.6			
Delay (s)	195.9	4.9			12.6	44.3	17.4	17.3	27.0			
Level of Service	F	A			B	D	B	B	C			
Approach Delay (s)		47.2			26.4			25.9			0.0	
Approach LOS		D			C			C			A	

Intersection Summary		
HCM 2000 Control Delay	32.1	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.77	
Actuated Cycle Length (s)	60.0	Sum of lost time (s) 13.5
Intersection Capacity Utilization	74.5%	ICU Level of Service D
Analysis Period (min)	15	

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	229	806	0	0	886	681	119	7	947	0	0	0
Future Volume (veh/h)	229	806	0	0	886	681	119	7	947	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1700	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	234	822	0	0	904	491	126	0	632			
Adj No. of Lanes	1	2	0	0	2	1	2	0	2			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	170	1938	0	0	1379	617	863	0	816			
Arrive On Green	0.11	0.57	0.00	0.00	0.40	0.40	0.27	0.00	0.27			
Sat Flow, veh/h	1619	3510	0	0	3510	1530	3238	0	3060			
Grp Volume(v), veh/h	234	822	0	0	904	491	126	0	632			
Grp Sat Flow(s),veh/h/ln	1619	1710	0	0	1710	1530	1619	0	1530			
Q Serve(g_s), s	6.3	8.2	0.0	0.0	12.9	16.9	1.8	0.0	11.5			
Cycle Q Clear(g_c), s	6.3	8.2	0.0	0.0	12.9	16.9	1.8	0.0	11.5			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	170	1938	0	0	1379	617	863	0	816			
V/C Ratio(X)	1.38	0.42	0.00	0.00	0.66	0.80	0.15	0.00	0.77			
Avail Cap(c_a), veh/h	170	1938	0	0	1379	617	863	0	816			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.39	0.39	1.00	0.00	1.00			
Uniform Delay (d), s/veh	26.9	7.4	0.0	0.0	14.5	15.7	16.8	0.0	20.3			
Incr Delay (d2), s/veh	201.9	0.7	0.0	0.0	1.0	4.2	0.4	0.0	7.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	12.3	4.0	0.0	0.0	6.2	7.8	0.8	0.0	5.6			
LnGrp Delay(d),s/veh	228.7	8.1	0.0	0.0	15.5	19.9	17.1	0.0	27.4			
LnGrp LOS	F	A			B	B	B		C			
Approach Vol, veh/h		1056			1395			758				
Approach Delay, s/veh		57.0			17.0			25.7				
Approach LOS		E			B			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		39.0			9.8	29.2		21.0				
Change Period (Y+Rc), s		5.0			3.5	5.0		5.0				
Max Green Setting (Gmax), s		34.0			6.3	24.2		16.0				
Max Q Clear Time (g_c+I1), s		10.2			8.3	18.9		13.5				
Green Ext Time (p_c), s		15.0			0.0	4.5		0.9				
Intersection Summary												
HCM 2010 Ctrl Delay			32.2									
HCM 2010 LOS			C									
Notes												

Timings
3: E St. & Orange Show Rd.

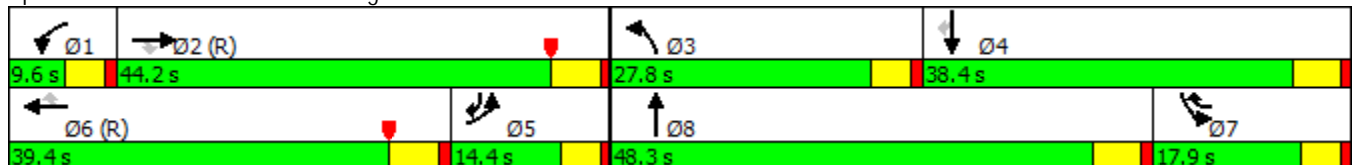


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑	↗	↔↔	↑↑	↗	↖	↑↔	↔↔	↑↑	↗
Traffic Volume (vph)	237	1154	354	151	913	128	316	385	228	268	258
Future Volume (vph)	237	1154	354	151	913	128	316	385	228	268	258
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8	7	4	5
Permitted Phases			2			6					4
Detector Phase	5	2	2	1	6	7	3	8	7	4	5
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0
Minimum Split (s)	9.6	39.4	39.4	9.6	39.4	9.6	9.6	38.4	9.6	38.4	9.6
Total Split (s)	14.4	44.2	44.2	9.6	39.4	17.9	27.8	48.3	17.9	38.4	14.4
Total Split (%)	12.0%	36.8%	36.8%	8.0%	32.8%	14.9%	23.2%	40.3%	14.9%	32.0%	12.0%
Yellow Time (s)	3.6	4.4	4.4	3.6	4.4	3.6	3.6	4.4	3.6	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4	4.6	5.4	4.6
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	Max	None	Max	None
Act Effct Green (s)	9.8	38.8	38.8	5.0	34.0	52.7	23.2	42.9	13.3	33.0	43.6
Actuated g/C Ratio	0.08	0.32	0.32	0.04	0.28	0.44	0.19	0.36	0.11	0.28	0.36
v/c Ratio	0.95	1.03	0.48	1.18	0.93	0.16	1.06	0.42	0.67	0.28	0.37
Control Delay	93.8	73.9	12.3	160.7	57.9	8.8	115.8	27.4	61.4	35.1	10.1
Queue Delay	0.0	9.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	93.8	83.1	12.3	160.7	57.9	8.8	115.8	27.4	61.4	35.1	10.1
LOS	F	F	B	F	E	A	F	C	E	D	B
Approach Delay		70.2			65.7			60.4		34.5	
Approach LOS		E			E			E		C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 108 (90%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.18
 Intersection Signal Delay: 61.2
 Intersection LOS: E
 Intersection Capacity Utilization 103.7%
 ICU Level of Service G
 Analysis Period (min) 15































Splits and Phases: 3: E St. & Orange Show Rd.



























HCM Signalized Intersection Capacity Analysis
3: E St. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 			 		 	 	
Traffic Volume (vph)	237	1154	354	151	913	128	316	385	146	228	268	258
Future Volume (vph)	237	1154	354	151	913	128	316	385	146	228	268	258
Ideal Flow (vphp)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Total Lost time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95		0.97	0.95	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3200	3600	1800	3200	3600	1800	1600	3600		3200	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3200	3600	1800	3200	3600	1800	1600	3600		3200	3600	1800
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	247	1202	369	157	951	133	329	401	152	238	279	269
RTOR Reduction (vph)	0	0	192	0	0	68	0	33	0	0	0	68
Lane Group Flow (vph)	247	1202	177	157	951	65	329	520	0	238	279	201
Confl. Peds. (#/hr)									2			2
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	9.8	38.8	38.8	5.0	34.0	47.3	23.2	42.9		13.3	33.0	42.8
Effective Green, g (s)	9.8	38.8	38.8	5.0	34.0	47.3	23.2	42.9		13.3	33.0	42.8
Actuated g/C Ratio	0.08	0.32	0.32	0.04	0.28	0.39	0.19	0.36		0.11	0.28	0.36
Clearance Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	2.0	2.0	3.0		2.0	3.0	2.0
Lane Grp Cap (vph)	261	1164	582	133	1020	778	309	1287		354	990	642
v/s Ratio Prot	0.08	c0.33		0.05	c0.26	0.01	c0.21	c0.14		c0.07	0.08	0.03
v/s Ratio Perm			0.10			0.03						0.09
v/c Ratio	0.95	1.03	0.30	1.18	0.93	0.08	1.06	0.40		0.67	0.28	0.31
Uniform Delay, d1	54.8	40.6	30.5	57.5	41.9	22.8	48.4	29.0		51.3	34.2	28.0
Progression Factor	1.03	1.05	1.34	0.78	1.11	1.65	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	34.8	32.2	1.1	119.5	11.3	0.0	69.4	0.9		3.9	0.7	0.1
Delay (s)	91.1	74.6	41.9	164.6	57.7	37.6	117.8	29.9		55.2	34.9	28.1
Level of Service	F	E	D	F	E	D	F	C		E	C	C
Approach Delay (s)		70.2			69.1			62.7			38.7	
Approach LOS		E			E			E			D	
Intersection Summary												
HCM 2000 Control Delay			63.3									E
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			120.0						20.0			
Intersection Capacity Utilization			103.7%									G
Analysis Period (min)			15									
c Critical Lane Group												

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	237	1154	354	151	913	128	316	385	146	228	268	258
Future Volume (veh/h)	237	1154	354	151	913	128	316	385	146	228	268	258
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	247	1202	193	157	951	77	329	401	121	238	279	162
Adj No. of Lanes	2	2	1	2	2	1	1	2	0	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	638	1587	710	123	969	593	295	928	277	308	940	750
Arrive On Green	0.43	0.93	0.93	0.01	0.09	0.09	0.19	0.36	0.36	0.10	0.28	0.28
Sat Flow, veh/h	2956	3420	1530	2956	3420	1530	1524	2597	775	2956	3420	1527
Grp Volume(v), veh/h	247	1202	193	157	951	77	329	263	259	238	279	162
Grp Sat Flow(s),veh/h/ln	1478	1710	1530	1478	1710	1530	1524	1710	1662	1478	1710	1527
Q Serve(g_s), s	6.8	10.2	1.5	5.0	33.3	0.0	23.2	14.0	14.3	9.4	7.7	3.3
Cycle Q Clear(g_c), s	6.8	10.2	1.5	5.0	33.3	0.0	23.2	14.0	14.3	9.4	7.7	3.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.47	1.00		1.00
Lane Grp Cap(c), veh/h	638	1587	710	123	969	593	295	611	594	308	941	750
V/C Ratio(X)	0.39	0.76	0.27	1.27	0.98	0.13	1.12	0.43	0.44	0.77	0.30	0.22
Avail Cap(c_a), veh/h	638	1587	710	123	969	593	295	611	594	328	941	750
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.73	0.73	0.73	0.57	0.57	0.57	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.7	2.7	2.4	59.2	54.1	30.4	48.4	29.3	29.4	52.4	34.3	10.8
Incr Delay (d2), s/veh	0.1	2.5	0.7	154.6	17.9	0.3	87.6	2.2	2.3	9.1	0.8	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	4.5	0.7	4.7	18.2	2.2	16.9	6.9	6.9	4.2	3.7	2.1
LnGrp Delay(d),s/veh	28.8	5.2	3.1	213.8	72.0	30.7	136.0	31.5	31.7	61.4	35.1	11.5
LnGrp LOS	C	A	A	F	E	C	F	C	C	E	D	B
Approach Vol, veh/h		1642			1185			851			679	
Approach Delay, s/veh		8.5			88.1			71.9			38.7	
Approach LOS		A			F			E			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.6	61.2	27.8	38.4	31.4	39.4	17.9	48.3				
Change Period (Y+Rc), s	4.6	5.4	4.6	5.4	5.4	* 5.4	5.4	* 5.4				
Max Green Setting (Gmax), s	5.0	38.8	23.2	33.0	9.8	* 34	13.3	* 43				
Max Q Clear Time (g_c+I1), s	7.0	12.2	25.2	9.7	8.8	35.3	11.4	16.3				
Green Ext Time (p_c), s	0.0	14.8	0.0	2.6	0.3	0.0	0.6	3.1				
Intersection Summary												
HCM 2010 Ctrl Delay			47.3									
HCM 2010 LOS			D									
Notes												

Timings
4: Arrowhead Av. & Orange Show Rd.

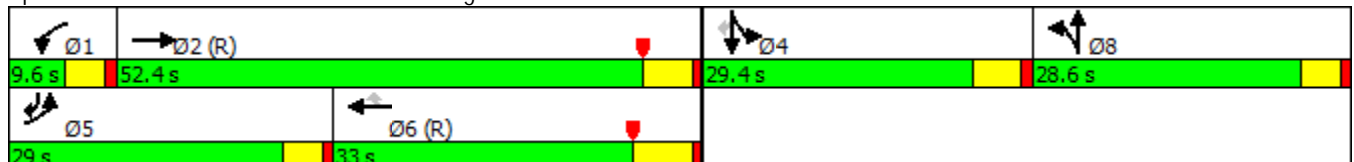


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖	↗	↖	↗	↗
Traffic Volume (vph)	297	1062	10	710	140	21	9	189	2	495
Future Volume (vph)	297	1062	10	710	140	21	9	189	2	495
Turn Type	Prot	NA	Prot	NA	Perm	Split	NA	Split	NA	pm+ov
Protected Phases	5	2	1	6		8	8	4	4	5
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	8	8	4	4	5
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	28.4	9.6	29.2	29.2	28.6	28.6	29.4	29.4	9.6
Total Split (s)	29.0	52.4	9.6	33.0	33.0	28.6	28.6	29.4	29.4	29.0
Total Split (%)	24.2%	43.7%	8.0%	27.5%	27.5%	23.8%	23.8%	24.5%	24.5%	24.2%
Yellow Time (s)	3.6	4.4	3.6	5.2	5.2	3.6	3.6	4.4	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	6.2	6.2	4.6	4.6	5.4	5.4	4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	C-Max	None	C-Max	C-Max	Max	Max	Max	Max	None
Act Effect Green (s)	23.8	54.7	5.0	27.4	27.4	24.0	24.0	24.0	24.0	48.6
Actuated g/C Ratio	0.20	0.46	0.04	0.23	0.23	0.20	0.20	0.20	0.20	0.40
v/c Ratio	0.95	0.70	0.16	0.93	0.29	0.07	0.13	0.30	0.29	0.53
Control Delay	74.2	10.0	60.7	64.0	7.4	39.7	16.3	43.7	43.4	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.2	10.0	60.7	64.0	7.4	39.7	16.3	43.7	43.4	4.3
LOS	E	A	E	E	A	D	B	D	D	A
Approach Delay		24.0		54.7			23.6		15.2	
Approach LOS		C		D			C		B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 32 (27%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.95
 Intersection Signal Delay: 30.8
 Intersection LOS: C
 Intersection Capacity Utilization 88.1%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 4: Arrowhead Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
4: Arrowhead Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	297	1062	4	10	710	140	21	9	38	189	2	495
Future Volume (vph)	297	1062	4	10	710	140	21	9	38	189	2	495
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	6.2	6.2	4.6	4.6		5.4	5.4	4.6
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		0.95	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	0.97		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.88		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00
Satd. Flow (prot)	1700	3600		1700	3600	1800	1700	1800		1700	1800	1800
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00
Satd. Flow (perm)	1700	3600		1700	3600	1800	1700	1800		1700	1800	1800
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	319	1142	4	11	763	151	23	10	41	203	2	532
RTOR Reduction (vph)	0	0	0	0	0	117	0	33	0	0	0	271
Lane Group Flow (vph)	319	1146	0	11	763	34	23	18	0	101	104	261
Confl. Peds. (#/hr)									15			23
Confl. Bikes (#/hr)												1
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		8	8		4	4	5
Permitted Phases						6						4
Actuated Green, G (s)	23.8	51.0		1.0	27.4	27.4	24.0	24.0		24.0	24.0	47.8
Effective Green, g (s)	23.8	51.0		1.0	27.4	27.4	24.0	24.0		24.0	24.0	47.8
Actuated g/C Ratio	0.20	0.42		0.01	0.23	0.23	0.20	0.20		0.20	0.20	0.40
Clearance Time (s)	4.6	5.4		4.6	6.2	6.2	4.6	4.6		5.4	5.4	4.6
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	3.0	3.0		3.0	3.0	2.0
Lane Grp Cap (vph)	337	1530		14	822	411	340	360		340	360	717
v/s Ratio Prot	c0.19	0.32		0.01	c0.21		c0.01	0.01		0.06	0.06	c0.07
v/s Ratio Perm						0.02						0.07
v/c Ratio	0.95	0.75		0.79	0.93	0.08	0.07	0.05		0.30	0.29	0.36
Uniform Delay, d1	47.5	29.1		59.4	45.3	36.4	38.9	38.8		40.8	40.8	25.4
Progression Factor	1.15	0.33		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	18.2	1.3		123.8	18.1	0.4	0.4	0.3		2.2	2.0	0.1
Delay (s)	72.8	11.0		183.2	63.5	36.8	39.3	39.1		43.0	42.8	25.5
Level of Service	E	B		F	E	D	D	D		D	D	C
Approach Delay (s)		24.5			60.5			39.1			30.4	
Approach LOS		C			E			D			C	

Intersection Summary























HCM 2000 Control Delay	36.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.8
Intersection Capacity Utilization	88.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
 4: Arrowhead Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	297	1062	4	10	710	140	21	9	38	189	2	495
Future Volume (veh/h)	297	1062	4	10	710	140	21	9	38	189	2	495
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	319	1142	4	11	763	99	23	10	26	204	0	463
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	329	1447	5	21	764	342	324	87	227	648	0	603
Arrive On Green	0.41	0.83	0.83	0.01	0.22	0.22	0.20	0.20	0.20	0.20	0.00	0.20
Sat Flow, veh/h	1619	3496	12	1619	3420	1530	1619	436	1133	3238	0	1458
Grp Volume(v), veh/h	319	559	587	11	763	99	23	0	36	204	0	463
Grp Sat Flow(s),veh/h/ln	1619	1710	1798	1619	1710	1530	1619	0	1569	1619	0	1458
Q Serve(g_s), s	23.2	19.5	19.5	0.8	26.8	6.4	1.4	0.0	2.3	6.5	0.0	24.0
Cycle Q Clear(g_c), s	23.2	19.5	19.5	0.8	26.8	6.4	1.4	0.0	2.3	6.5	0.0	24.0
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.72	1.00		1.00
Lane Grp Cap(c), veh/h	329	708	744	21	764	342	324	0	314	648	0	603
V/C Ratio(X)	0.97	0.79	0.79	0.53	1.00	0.29	0.07	0.00	0.11	0.31	0.00	0.77
Avail Cap(c_a), veh/h	329	708	744	67	764	342	324	0	314	648	0	603
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.15	0.15	0.15	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.2	7.7	7.7	58.9	46.6	38.7	39.0	0.0	39.3	41.0	0.0	31.2
Incr Delay (d2), s/veh	12.9	1.4	1.4	7.6	32.3	2.1	0.4	0.0	0.7	1.3	0.0	9.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.5	9.0	9.4	0.4	16.0	2.9	0.7	0.0	1.0	3.0	0.0	14.8
LnGrp Delay(d),s/veh	48.1	9.2	9.1	66.5	78.9	40.8	39.4	0.0	40.0	42.3	0.0	40.3
LnGrp LOS	D	A	A	E	E	D	D		D	D		D
Approach Vol, veh/h		1465			873			59			667	
Approach Delay, s/veh		17.6			74.4			39.8			40.9	
Approach LOS		B			E			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.1	55.9		29.4	29.0	33.0		28.6				
Change Period (Y+Rc), s	4.6	* 6.2		5.4	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.0	* 47		24.0	24.4	26.8		24.0				
Max Q Clear Time (g_c+I1), s	2.8	21.5		26.0	25.2	28.8		4.3				
Green Ext Time (p_c), s	0.0	18.6		0.0	0.0	0.0		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay				39.3								
HCM 2010 LOS				D								
Notes												

Timings

5: Washington Av./Washington Av. & Orange Show Rd.

3/27/2017

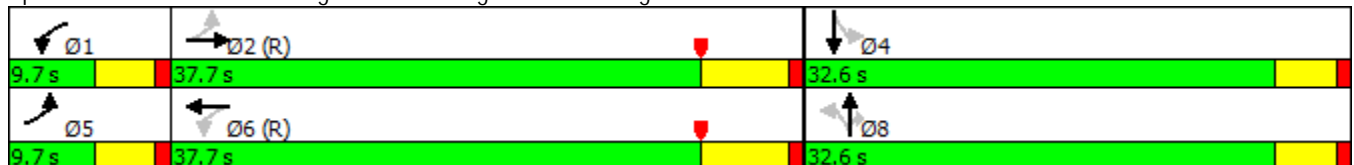


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↖	↗		↖	↗		↕
Traffic Volume (vph)	34	1269	4	786	47	2	5	1	1
Future Volume (vph)	34	1269	4	786	47	2	5	1	1
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	Perm	NA
Protected Phases	5	2	1	6		8			4
Permitted Phases	2		6		8		8	4	
Detector Phase	5	2	1	6	8	8	8	4	4
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	9.6	23.2	32.6	32.6	32.6	32.6	32.6
Total Split (s)	9.7	37.7	9.7	37.7	32.6	32.6	32.6	32.6	32.6
Total Split (%)	12.1%	47.1%	12.1%	47.1%	40.8%	40.8%	40.8%	40.8%	40.8%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6	4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None
Act Effect Green (s)	64.0	62.0	63.0	58.1		13.6	13.6		13.6
Actuated g/C Ratio	0.80	0.78	0.79	0.73		0.17	0.17		0.17
v/c Ratio	0.03	0.51	0.00	0.33		0.18	0.01		0.04
Control Delay	5.3	10.1	6.2	9.2		27.2	0.0		12.8
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Delay	5.3	10.1	6.2	9.2		27.2	0.0		12.8
LOS	A	B	A	A		C	A		B
Approach Delay		10.0		9.1		24.9			12.8
Approach LOS		B		A		C			B

Intersection Summary

Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.51
 Intersection Signal Delay: 10.1
 Intersection LOS: B
 Intersection Capacity Utilization 67.4%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 5: Washington Av./Washington Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 5: Washington Av./Washington Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017






















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕		↖	↕			↕	↗		↕	↗
Traffic Volume (vph)	34	1269	25	4	786	8	47	2	5	1	1	11
Future Volume (vph)	34	1269	25	4	786	8	47	2	5	1	1	11
Ideal Flow (vphp)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2		4.6	6.2			4.6	4.6		4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85		0.88	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		1.00	
Satd. Flow (prot)	1700	3600		1700	3600			1800	1800		1800	
Flt Permitted	0.29	1.00		0.15	1.00			0.72	1.00		0.98	
Satd. Flow (perm)	1700	3600		1700	3600			1800	1800		1800	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	37	1395	27	4	864	9	52	2	5	1	1	12
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	4	0	11	0
Lane Group Flow (vph)	37	1421	0	4	873	0	0	54	1	0	3	0
Confl. Bikes (#/hr)			1									1
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)	57.0	54.0		53.0	52.0			9.6	9.6		9.6	
Effective Green, g (s)	57.0	54.0		53.0	52.0			9.6	9.6		9.6	
Actuated g/C Ratio	0.71	0.68		0.66	0.65			0.12	0.12		0.12	
Clearance Time (s)	4.6	6.2		4.6	6.2			4.6	4.6		4.6	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	1211	2430		1126	2340			216	216		216	
v/s Ratio Prot	c0.00	c0.39		0.00	0.24							
v/s Ratio Perm	0.02			0.00				0.03	0.00		0.00	
v/c Ratio	0.03	0.58		0.00	0.37			0.25	0.00		0.02	
Uniform Delay, d1	3.6	7.0		5.2	6.5			31.9	31.0		31.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.0	1.0		0.0	0.5			0.6	0.0		0.0	
Delay (s)	3.6	8.0		5.2	6.9			32.5	31.0		31.1	
Level of Service	A	A		A	A			C	C		C	
Approach Delay (s)		7.9			6.9			32.4			31.1	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.4
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary
 5: Washington Av./Washington Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	1269	25	4	786	8	47	2	5	1	1	11
Future Volume (veh/h)	34	1269	25	4	786	8	47	2	5	1	1	11
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	37	1395	27	4	864	9	52	2	4	1	1	2
Adj No. of Lanes	1	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	495	2431	47	283	2354	25	218	7	143	73	58	75
Arrive On Green	0.04	0.71	0.71	0.01	0.68	0.68	0.09	0.09	0.09	0.09	0.09	0.09
Sat Flow, veh/h	1619	3430	66	1619	3468	36	1383	72	1530	183	617	799
Grp Volume(v), veh/h	37	695	727	4	426	447	54	0	4	4	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1787	1619	1710	1794	1454	0	1530	1599	0	0
Q Serve(g_s), s	0.5	16.0	16.0	0.1	8.5	8.5	2.6	0.0	0.2	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.5	16.0	16.0	0.1	8.5	8.5	2.8	0.0	0.2	0.2	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.02	0.96		1.00	0.25		0.50
Lane Grp Cap(c), veh/h	495	1212	1266	283	1161	1218	224	0	143	206	0	0
V/C Ratio(X)	0.07	0.57	0.57	0.01	0.37	0.37	0.24	0.00	0.03	0.02	0.00	0.00
Avail Cap(c_a), veh/h	542	1212	1266	377	1161	1218	595	0	535	604	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.14	0.14	0.14	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	3.8	5.7	5.7	5.2	5.5	5.5	34.1	0.0	33.0	33.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	2.0	1.9	0.0	0.1	0.1	0.5	0.0	0.1	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	8.0	8.3	0.0	3.9	4.1	1.2	0.0	0.1	0.1	0.0	0.0
LnGrp Delay(d),s/veh	3.9	7.7	7.6	5.2	5.6	5.6	34.7	0.0	33.0	33.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C		C	C		
Approach Vol, veh/h		1459			877			58				4
Approach Delay, s/veh		7.6			5.6			34.5				33.0
Approach LOS		A			A			C				C
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.0	62.9		12.1	7.4	60.5		12.1				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.1	31.5		28.0	5.1	31.5		28.0				
Max Q Clear Time (g_c+I1), s	2.1	18.0		2.2	2.5	10.5		4.8				
Green Ext Time (p_c), s	0.0	11.8		0.3	0.0	17.3		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			7.5									
HCM 2010 LOS			A									

Intersection

Int Delay, s/veh 4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	32	0	0	14	10	14
Future Vol, veh/h	32	0	0	14	10	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	35	0	0	15	11	15

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	33	18	26	0	-	0
Stage 1	18	-	-	-	-	-
Stage 2	15	-	-	-	-	-
Critical Hdwy	7.1	6.2	4.1	-	-	-
Critical Hdwy Stg 1	6.1	-	-	-	-	-
Critical Hdwy Stg 2	6.1	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	979	1066	1601	-	-	-
Stage 1	1006	-	-	-	-	-
Stage 2	1010	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	979	1066	1601	-	-	-
Mov Cap-2 Maneuver	979	-	-	-	-	-
Stage 1	1006	-	-	-	-	-
Stage 2	1010	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1601	-	979	-	-
HCM Lane V/C Ratio	-	-	0.036	-	-
HCM Control Delay (s)	0	-	8.8	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection												
Int Delay, s/veh	4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↔	
Traffic Vol, veh/h	0	0	0	0	0	18	0	0	0	15	0	0
Future Vol, veh/h	0	0	0	0	0	18	0	0	0	15	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	54	54	54	54	54	54	54	54	54	54	54	54
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	33	0	0	0	28	0	0

Major/Minor	Major1			Major2			Minor2				
Conflicting Flow All	33	0	-	-	-	0	-	-	17	17	17
Stage 1	-	-	-	-	-	-	-	-	17	17	-
Stage 2	-	-	-	-	-	-	-	-	0	0	-
Critical Hdwy	4.1	-	-	-	-	-	-	-	6.4	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	5.4	5.5	-
Follow-up Hdwy	2.2	-	-	-	-	-	-	-	3.5	4	3.3
Pot Cap-1 Maneuver	1592	-	0	0	-	-	-	-	1006	881	1068
Stage 1	-	-	0	0	-	-	-	-	1011	885	-
Stage 2	-	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1592	-	-	-	-	-	-	-	1006	0	1068
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	1006	0	-
Stage 1	-	-	-	-	-	-	-	-	1011	0	-
Stage 2	-	-	-	-	-	-	-	-	-	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1592	-	-	-	1006
HCM Lane V/C Ratio	-	-	-	-	0.028
HCM Control Delay (s)	0	-	-	-	8.7
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection

Int Delay, s/veh 7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	0	3	15	0	32	0	10	14	0
Future Vol, veh/h	0	0	0	0	3	15	0	32	0	10	14	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	69	69	69	69	69	69	69	69	69	69	69	69
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	4	22	0	46	0	14	20	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	26	0	0	1	0	0	26	27	1	40	16	15
Stage 1	-	-	-	-	-	-	1	1	-	15	15	-
Stage 2	-	-	-	-	-	-	25	26	-	25	1	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1601	-	-	1635	-	-	990	870	1090	969	882	1070
Stage 1	-	-	-	-	-	-	1027	899	-	1010	887	-
Stage 2	-	-	-	-	-	-	998	878	-	998	899	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1601	-	-	1635	-	-	973	870	1090	930	882	1070
Mov Cap-2 Maneuver	-	-	-	-	-	-	973	870	-	930	882	-
Stage 1	-	-	-	-	-	-	1027	899	-	1010	887	-
Stage 2	-	-	-	-	-	-	975	878	-	947	899	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	9.4	9.2
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	870	1601	-	-	1635	-	-	901
HCM Lane V/C Ratio	0.053	-	-	-	-	-	-	0.039
HCM Control Delay (s)	9.4	0	-	-	0	-	-	9.2
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.1

Timings

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.

3/27/2017

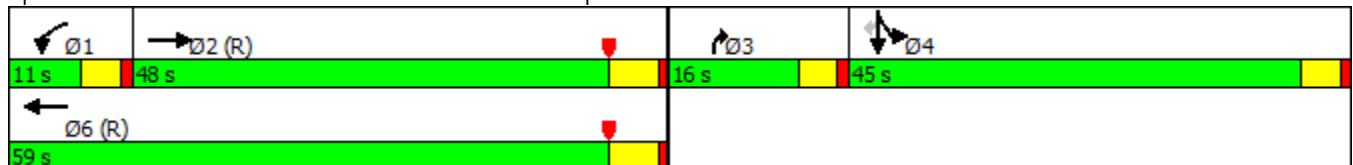


Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↖	↑↑	↗	↖	↗	↗
Traffic Volume (vph)	651	22	581	64	516	127	390
Future Volume (vph)	651	22	581	64	516	127	390
Turn Type	NA	Prot	NA	Prot	Split	NA	Perm
Protected Phases	2	1	6	3	4	4	
Permitted Phases							4
Detector Phase	2	1	6	3	4	4	4
Switch Phase							
Minimum Initial (s)	10.0	5.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	22.4	9.6	15.4	9.5	14.6	14.6	14.6
Total Split (s)	48.0	11.0	59.0	16.0	45.0	45.0	45.0
Total Split (%)	40.0%	9.2%	49.2%	13.3%	37.5%	37.5%	37.5%
Yellow Time (s)	4.4	3.6	4.4	3.5	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	4.6	5.4	4.5	4.6	4.6	4.6
Lead/Lag	Lag	Lead		Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes
Recall Mode	C-Max	None	C-Max	None	Max	Max	Max
Act Effect Green (s)	47.1	5.8	53.6	5.5	48.4	48.4	48.4
Actuated g/C Ratio	0.39	0.05	0.45	0.05	0.40	0.40	0.40
v/c Ratio	0.51	0.29	0.39	0.28	0.50	0.48	0.45
Control Delay	30.1	64.2	23.1	2.9	30.7	30.0	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.1	64.2	23.1	2.9	30.7	30.0	6.7
LOS	C	E	C	A	C	C	A
Approach Delay	30.1		24.7			21.4	
Approach LOS	C		C			C	

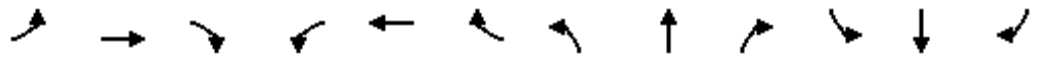
Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 11 (9%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.51
 Intersection Signal Delay: 24.2
 Intersection LOS: C
 Intersection Capacity Utilization 54.5%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.






















HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑↑				↑	↑	↑	↑
Traffic Volume (vph)	0	651	18	22	581	0	0	0	64	516	127	390
Future Volume (vph)	0	651	18	22	581	0	0	0	64	516	127	390
Ideal Flow (vphp)	1800	1800	1800	1700	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Lane Util. Factor		0.95		1.00	0.95				1.00	0.95	0.95	1.00
Frbp, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00		1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00				1.00	0.95	0.97	1.00
Satd. Flow (prot)		3600		1700	3600				1800	1700	1800	1800
Flt Permitted		1.00		0.95	1.00				1.00	0.95	0.97	1.00
Satd. Flow (perm)		3600		1700	3600				1800	1700	1800	1800
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	700	19	24	625	0	0	0	69	555	137	419
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	66	0	0	208
Lane Group Flow (vph)	0	718	0	24	625	0	0	0	3	344	348	211
Confl. Peds. (#/hr)			3			1						
Turn Type		NA		Prot	NA				Prot	Split	NA	Perm
Protected Phases		2		1	6				3	4	4	
Permitted Phases												4
Actuated Green, G (s)		44.3		3.8	52.7				4.4	48.4	48.4	48.4
Effective Green, g (s)		44.3		3.8	52.7				4.4	48.4	48.4	48.4
Actuated g/C Ratio		0.37		0.03	0.44				0.04	0.40	0.40	0.40
Clearance Time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Vehicle Extension (s)		3.0		2.0	3.0				3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1329		53	1581				66	685	726	726
v/s Ratio Prot		c0.20		0.01	c0.17				c0.00	c0.20	0.19	
v/s Ratio Perm												0.12
v/c Ratio		0.54		0.45	0.40				0.04	0.50	0.48	0.29
Uniform Delay, d1		29.8		57.1	22.8				55.8	26.8	26.5	24.2
Progression Factor		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		1.6		2.2	0.7				0.2	2.6	2.3	1.0
Delay (s)		31.4		59.3	23.6				56.0	29.4	28.7	25.2
Level of Service		C		E	C				E	C	C	C
Approach Delay (s)		31.4			24.9			56.0			27.6	
Approach LOS		C			C			E			C	

Intersection Summary		
HCM 2000 Control Delay	28.8	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.50	C
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	54.5%	19.1
Analysis Period (min)	15	ICU Level of Service
		A
c Critical Lane Group		

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	651	18	22	581	0	0	0	64	516	127	390
Future Volume (veh/h)	0	651	18	22	581	0	0	0	64	516	127	390
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	0	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	700	13	24	625	0	0	0	41	346	430	417
Adj No. of Lanes	0	2	0	1	2	0	0	0	1	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1782	33	37	1984	0	0	0	0	545	606	515
Arrive On Green	0.00	0.52	0.52	0.02	0.58	0.00	0.00	0.00	0.00	0.34	0.34	0.34
Sat Flow, veh/h	0	3525	64	1619	3510	0		0		1619	1800	1530
Grp Volume(v), veh/h	0	348	365	24	625	0		0.0		346	430	417
Grp Sat Flow(s),veh/h/ln	0	1710	1789	1619	1710	0				1619	1800	1530
Q Serve(g_s), s	0.0	14.8	14.8	1.8	11.3	0.0				21.6	25.0	29.8
Cycle Q Clear(g_c), s	0.0	14.8	14.8	1.8	11.3	0.0				21.6	25.0	29.8
Prop In Lane	0.00		0.04	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	887	928	37	1984	0				545	606	515
V/C Ratio(X)	0.00	0.39	0.39	0.65	0.32	0.00				0.63	0.71	0.81
Avail Cap(c_a), veh/h	0	887	928	86	1984	0				545	606	515
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.54	0.54	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	17.5	17.5	58.1	13.0	0.0				33.6	34.7	36.3
Incr Delay (d2), s/veh	0.0	1.3	1.3	3.7	0.2	0.0				5.6	6.9	12.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.3	7.6	0.8	5.4	0.0				10.5	13.6	14.5
LnGrp Delay(d),s/veh	0.0	18.8	18.7	61.9	13.2	0.0				39.1	41.6	49.2
LnGrp LOS		B	B	E	B					D	D	D
Approach Vol, veh/h		713			649						1193	
Approach Delay, s/veh		18.7			15.0						43.5	
Approach LOS		B			B						D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	7.4	67.6		45.0		75.0						
Change Period (Y+Rc), s	4.6	5.4		4.6		5.4						
Max Green Setting (Gmax), s	6.4	42.6		40.4		53.6						
Max Q Clear Time (g_c+I1), s	3.8	16.8		31.8		13.3						
Green Ext Time (p_c), s	0.0	9.2		3.4		10.4						
Intersection Summary												
HCM 2010 Ctrl Delay			29.4									
HCM 2010 LOS			C									
Notes												

Timings

9: Waterman Av. & Orange Show Rd./Orange Show Rd.

3/27/2017

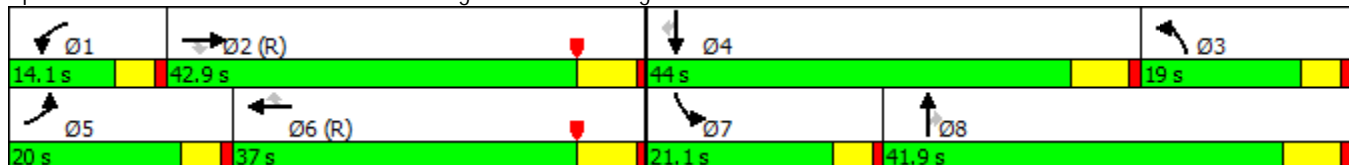


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗	↘	↘	↗	↘	↘	↗	↘	↘	↗	↘
Traffic Volume (vph)	173	881	238	81	458	87	249	745	143	143	776	122
Future Volume (vph)	173	881	238	81	458	87	249	745	143	143	776	122
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.2	35.2	9.6	35.2	35.2	9.6	33.2	33.2	9.6	33.2	33.2
Total Split (s)	20.0	42.9	42.9	14.1	37.0	37.0	19.0	41.9	41.9	21.1	44.0	44.0
Total Split (%)	16.7%	35.8%	35.8%	11.8%	30.8%	30.8%	15.8%	34.9%	34.9%	17.6%	36.7%	36.7%
Yellow Time (s)	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Act Effct Green (s)	14.7	37.5	37.5	8.7	31.5	31.5	14.4	38.3	38.3	13.9	37.8	37.8
Actuated g/C Ratio	0.12	0.31	0.31	0.07	0.26	0.26	0.12	0.32	0.32	0.12	0.32	0.32
v/c Ratio	0.88	0.82	0.34	0.70	1.02	0.15	1.28	0.68	0.22	0.77	0.72	0.19
Control Delay	88.4	45.7	5.6	82.4	91.0	0.5	202.3	39.8	5.4	75.8	40.8	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.4	45.7	5.6	82.4	91.0	0.5	202.3	39.8	5.4	75.8	40.8	2.3
LOS	F	D	A	F	F	A	F	D	A	E	D	A
Approach Delay		44.0			77.3			71.0			41.1	
Approach LOS		D			E			E			D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.28
 Intersection Signal Delay: 55.8
 Intersection LOS: E
 Intersection Capacity Utilization 92.2%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑	↗	↘	↑↑	↗	↘	↑↑	↗
Traffic Volume (vph)	173	881	238	81	458	87	249	745	143	143	776	122
Future Volume (vph)	173	881	238	81	458	87	249	745	143	143	776	122
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	182	927	251	85	482	92	262	784	151	151	817	128
RTOR Reduction (vph)	0	0	168	0	0	68	0	0	103	0	0	88
Lane Group Flow (vph)	182	927	83	85	482	24	262	784	48	151	817	40
Confl. Peds. (#/hr)			1						1			
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	14.7	37.5	37.5	8.7	31.5	31.5	14.4	38.3	38.3	13.9	37.8	37.8
Effective Green, g (s)	14.7	37.5	37.5	8.7	31.5	31.5	14.4	38.3	38.3	13.9	37.8	37.8
Actuated g/C Ratio	0.12	0.31	0.31	0.07	0.26	0.26	0.12	0.32	0.32	0.12	0.31	0.31
Clearance Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	208	1125	562	123	472	472	204	1149	574	196	1134	567
v/s Ratio Prot	c0.11	0.26		0.05	c0.27		c0.15	0.22		0.09	c0.23	
v/s Ratio Perm			0.05			0.01			0.03			0.02
v/c Ratio	0.88	0.82	0.15	0.69	1.02	0.05	1.28	0.68	0.08	0.77	0.72	0.07
Uniform Delay, d1	51.7	38.2	29.7	54.3	44.2	33.1	52.8	35.6	28.6	51.5	36.4	28.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	30.2	6.9	0.6	12.7	46.9	0.2	159.8	3.3	0.3	15.5	4.0	0.2
Delay (s)	81.9	45.1	30.3	67.0	91.1	33.3	212.6	38.8	28.9	67.0	40.4	29.0
Level of Service	F	D	C	E	F	C	F	D	C	E	D	C
Approach Delay (s)		47.3			80.0			75.6			42.7	
Approach LOS		D			E			E			D	
Intersection Summary												
HCM 2000 Control Delay			59.0									E
HCM 2000 Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			120.0							21.6		
Intersection Capacity Utilization			92.2%									F
ICU Level of Service												
Analysis Period (min)			15									
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	173	881	238	81	458	87	249	745	143	143	776	122
Future Volume (veh/h)	173	881	238	81	458	87	249	745	143	143	776	122
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	182	927	198	85	482	57	262	784	100	151	817	90
Adj No. of Lanes	1	2	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	206	2441	1078	104	1172	997	194	1163	520	175	1077	482
Arrive On Green	0.13	0.71	0.71	0.06	0.65	0.65	0.12	0.34	0.34	0.11	0.31	0.31
Sat Flow, veh/h	1619	3420	1511	1619	1800	1530	1619	3420	1529	1619	3420	1530
Grp Volume(v), veh/h	182	927	198	85	482	57	262	784	100	151	817	90
Grp Sat Flow(s),veh/h/ln	1619	1710	1511	1619	1800	1530	1619	1710	1529	1619	1710	1530
Q Serve(g_s), s	13.3	12.8	8.5	6.2	15.3	1.6	14.4	23.5	5.5	11.0	25.8	6.6
Cycle Q Clear(g_c), s	13.3	12.8	8.5	6.2	15.3	1.6	14.4	23.5	5.5	11.0	25.8	6.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	206	2441	1078	104	1172	997	194	1163	520	175	1077	482
V/C Ratio(X)	0.89	0.38	0.18	0.81	0.41	0.06	1.35	0.67	0.19	0.86	0.76	0.19
Avail Cap(c_a), veh/h	208	2441	1078	128	1172	997	194	1163	520	223	1077	482
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.85	0.85	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.5	6.7	15.2	55.4	10.0	7.6	52.8	33.9	28.0	52.6	37.0	48.8
Incr Delay (d2), s/veh	28.6	0.4	0.3	22.5	1.1	0.1	186.9	3.1	0.8	19.9	5.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	6.1	3.6	3.4	7.8	0.7	16.5	11.6	2.5	5.9	12.9	2.9
LnGrp Delay(d),s/veh	80.1	7.1	15.5	77.9	11.0	7.7	239.7	37.0	28.8	72.5	42.0	49.6
LnGrp LOS	F	A	B	E	B	A	F	D	C	E	D	D
Approach Vol, veh/h		1307			624			1146			1058	
Approach Delay, s/veh		18.6			19.8			82.6			47.0	
Approach LOS		B			B			F			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.3	93.3	20.6	44.0	19.8	85.8	17.6	47.0				
Change Period (Y+Rc), s	4.6	6.2	6.2	* 6.2	4.6	6.2	4.6	6.2				
Max Green Setting (Gmax), s	9.5	36.7	14.4	* 38	15.4	30.8	16.5	35.7				
Max Q Clear Time (g_c+I1), s	8.2	14.8	16.4	27.8	15.3	17.3	13.0	25.5				
Green Ext Time (p_c), s	0.0	13.6	0.0	3.7	0.0	9.6	0.1	3.9				
Intersection Summary												
HCM 2010 Ctrl Delay			43.8									
HCM 2010 LOS			D									
Notes												

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↕	
Traffic Vol, veh/h	2	11	9	1133	1062	4
Future Vol, veh/h	2	11	9	1133	1062	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	75	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	2	12	10	1232	1154	4

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1792	579	1159 0
Stage 1	1157	-	- -
Stage 2	635	-	- -
Critical Hdwy	6.8	6.9	4.1 -
Critical Hdwy Stg 1	5.8	-	- -
Critical Hdwy Stg 2	5.8	-	- -
Follow-up Hdwy	3.5	3.3	2.2 -
Pot Cap-1 Maneuver	*74	*645	*969 -
Stage 1	*609	-	- -
Stage 2	*614	-	- -
Platoon blocked, %		1	1 -
Mov Cap-1 Maneuver	*73	*645	*969 -
Mov Cap-2 Maneuver	*311	-	- -
Stage 1	*609	-	- -
Stage 2	*608	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	11.6	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	*969	-	311	645	-	-
HCM Lane V/C Ratio	0.01	-	0.007	0.019	-	-
HCM Control Delay (s)	8.8	-	16.7	10.7	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0	0.1	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Timings
11: Waterman Av. & Driveway 2/Park Center Dr.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↕		↕	↕	↕	↕↕	↕	↕	↕↕
Traffic Volume (vph)	53	0	103	0	33	36	1126	16	8	1235
Future Volume (vph)	53	0	103	0	33	36	1126	16	8	1235
Turn Type	Perm	NA	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4		8		5	2		1	6
Permitted Phases	4		8		8	2		2	6	
Detector Phase	4	4	8	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	21.6	21.6	21.6	9.6	23.2	23.2	9.6	33.2
Total Split (s)	21.6	21.6	21.6	21.6	21.6	9.6	33.8	33.8	9.6	33.8
Total Split (%)	33.2%	33.2%	33.2%	33.2%	33.2%	14.8%	52.0%	52.0%	14.8%	52.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		4.6	4.6	4.6	6.2	6.2	4.6	6.2
Lead/Lag						Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)		11.6		11.6	11.6	46.2	44.9	44.9	47.1	42.9
Actuated g/C Ratio		0.18		0.18	0.18	0.71	0.69	0.69	0.72	0.66
v/c Ratio		0.43		0.36	0.09	0.15	0.50	0.01	0.01	0.59
Control Delay		10.2		26.0	0.4	5.6	9.1	0.0	4.4	12.0
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		10.2		26.0	0.4	5.6	9.1	0.0	4.4	12.0
LOS		B		C	A	A	A	A	A	B
Approach Delay		10.2		19.7			8.8			12.0
Approach LOS		B		B			A			B

Intersection Summary

Cycle Length: 65
 Actuated Cycle Length: 65
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.59
 Intersection Signal Delay: 10.9
 Intersection Capacity Utilization 62.6%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 11: Waterman Av. & Driveway 2/Park Center Dr.



HCM Signalized Intersection Capacity Analysis
 11: Waterman Av. & Driveway 2/Park Center Dr.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↕	↕	↕	↕↕	
Traffic Volume (vph)	53	0	82	103	0	33	36	1126	16	8	1235	22
Future Volume (vph)	53	0	82	103	0	33	36	1126	16	8	1235	22
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)		4.6			4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes		1.00			1.00	0.99	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.92			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1621			1800	1800	1615	3600	1800	1700	3600	
Flt Permitted		0.82			0.63	1.00	0.13	1.00	1.00	0.18	1.00	
Satd. Flow (perm)		1358			1800	1800	213	3600	1800	1700	3600	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	59	0	91	114	0	37	40	1251	18	9	1372	24
RTOR Reduction (vph)	0	112	0	0	0	32	0	0	7	0	1	0
Lane Group Flow (vph)	0	38	0	0	114	5	40	1251	11	9	1395	0
Confl. Peds. (#/hr)						1			1			1
Confl. Bikes (#/hr)									1			1
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		9.6			9.6	9.6	41.1	39.0	39.0	38.9	37.9	
Effective Green, g (s)		9.6			9.6	9.6	41.1	39.0	39.0	38.9	37.9	
Actuated g/C Ratio		0.15			0.15	0.15	0.63	0.60	0.60	0.60	0.58	
Clearance Time (s)		4.6			4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Vehicle Extension (s)		3.0			3.0	3.0	2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)		200			265	265	179	2160	1080	1017	2099	
v/s Ratio Prot							c0.01	0.35		0.00	c0.39	
v/s Ratio Perm		0.03			0.06	0.00	0.13		0.01	0.01		
v/c Ratio		0.19			0.43	0.02	0.22	0.58	0.01	0.01	0.66	
Uniform Delay, d1		24.3			25.2	23.7	6.1	8.0	5.2	5.7	9.2	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.5			1.1	0.0	0.2	1.1	0.0	0.0	1.7	
Delay (s)		24.8			26.3	23.7	6.4	9.1	5.2	5.7	10.9	
Level of Service		C			C	C	A	A	A	A	B	
Approach Delay (s)		24.8			25.7			9.0			10.9	
Approach LOS		C			C			A			B	

Intersection Summary






















HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	15.4
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
 11: Waterman Av. & Driveway 2/Park Center Dr.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	0	82	103	0	33	36	1126	16	8	1235	22
Future Volume (veh/h)	53	0	82	103	0	33	36	1126	16	8	1235	22
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	59	0	79	114	0	24	40	1251	18	9	1372	24
Adj No. of Lanes	0	1	0	0	1	1	1	2	1	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	133	28	110	314	0	293	257	1915	838	258	1828	32
Arrive On Green	0.19	0.00	0.19	0.19	0.00	0.19	0.04	0.56	0.56	0.01	0.53	0.53
Sat Flow, veh/h	282	146	572	1058	0	1528	1619	3420	1497	1619	3438	60
Grp Volume(v), veh/h	138	0	0	114	0	24	40	1251	18	9	682	714
Grp Sat Flow(s),veh/h/ln	1000	0	0	1058	0	1528	1619	1710	1497	1619	1710	1788
Q Serve(g_s), s	3.0	0.0	0.0	0.0	0.0	0.8	0.7	16.5	0.3	0.2	20.2	20.2
Cycle Q Clear(g_c), s	9.9	0.0	0.0	6.9	0.0	0.8	0.7	16.5	0.3	0.2	20.2	20.2
Prop In Lane	0.43		0.57	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	271	0	0	314	0	293	257	1915	838	258	909	951
V/C Ratio(X)	0.51	0.00	0.00	0.36	0.00	0.08	0.16	0.65	0.02	0.03	0.75	0.75
Avail Cap(c_a), veh/h	374	0	0	407	0	400	317	1915	838	363	909	951
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.2	0.0	0.0	24.0	0.0	21.6	9.7	9.9	6.4	8.5	11.8	11.9
Incr Delay (d2), s/veh	1.5	0.0	0.0	0.7	0.0	0.1	0.1	1.8	0.0	0.0	5.7	5.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	0.0	1.9	0.0	0.4	0.3	8.1	0.2	0.1	10.9	11.4
LnGrp Delay(d),s/veh	26.7	0.0	0.0	24.7	0.0	21.7	9.8	11.7	6.4	8.5	17.5	17.3
LnGrp LOS	C			C		C	A	B	A	A	B	B
Approach Vol, veh/h		138			138			1309			1405	
Approach Delay, s/veh		26.7			24.2			11.5			17.3	
Approach LOS		C			C			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.3	42.6		17.1	7.2	40.8		17.1				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.0	27.6		17.0	5.0	27.6		17.0				
Max Q Clear Time (g_c+I1), s	2.2	18.5		11.9	2.7	22.2		8.9				
Green Ext Time (p_c), s	0.0	8.6		0.7	0.0	5.2		1.0				
Intersection Summary												
HCM 2010 Ctrl Delay			15.6									
HCM 2010 LOS			B									

Timings
12: Waterman Av./Waterman Av. & Hospitality Ln.

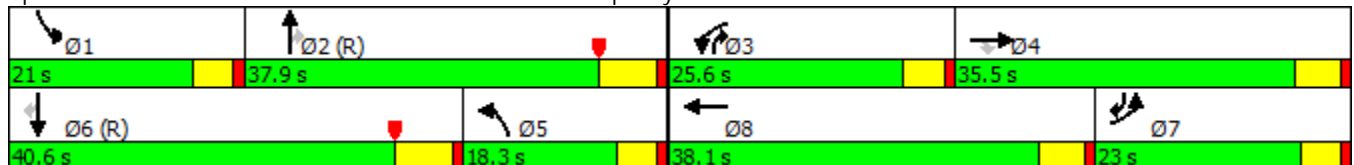


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗	↗	↗	↘	↗	↘
Traffic Volume (vph)	173	394	571	402	463	272	477	708	206	1005	170
Future Volume (vph)	173	394	571	402	463	272	477	708	206	1005	170
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8	5	2	3	1	6	7
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	3	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	15.1	15.1	9.6	38.1	9.6	36.2	9.6	9.6	36.2	9.6
Total Split (s)	23.0	35.5	35.5	25.6	38.1	18.3	37.9	25.6	21.0	40.6	23.0
Total Split (%)	19.2%	29.6%	29.6%	21.3%	31.8%	15.3%	31.6%	21.3%	17.5%	33.8%	19.2%
Yellow Time (s)	3.6	4.1	4.1	3.6	4.1	3.6	5.2	3.6	3.6	5.2	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	5.1	4.6	5.1	4.6	6.2	4.6	4.6	6.2	4.6
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effect Green (s)	20.4	27.2	27.2	19.4	26.3	13.7	35.3	61.0	17.5	39.2	65.7
Actuated g/C Ratio	0.17	0.23	0.23	0.16	0.22	0.11	0.29	0.51	0.15	0.33	0.55
v/c Ratio	0.64	0.78	0.55	0.83	0.77	0.79	0.48	0.39	0.88	0.61	0.17
Control Delay	57.3	42.8	15.8	64.2	50.6	68.2	37.7	13.3	84.6	36.7	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.3	42.8	15.8	64.2	50.6	68.2	37.7	13.3	84.6	36.7	6.2
LOS	E	D	B	E	D	E	D	B	F	D	A
Approach Delay		37.8			56.2		31.5			40.1	
Approach LOS		D			E		C			D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 22 (18%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 105
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 40.2
 Intersection LOS: D
 Intersection Capacity Utilization 86.4%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 12: Waterman Av./Waterman Av. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
 12: Waterman Av./Waterman Av. & Hospitality Ln.
























Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	173	394	571	402	463	121	272	477	708	206	1005	170
Future Volume (vph)	173	394	571	402	463	121	272	477	708	206	1005	170
Ideal Flow (vphp)	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Lane Util. Factor	1.00	0.91	0.91	0.97	0.95		0.97	0.95	0.88	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.94	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Flt Permitted	1.00	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	184	419	607	428	493	129	289	507	753	219	1069	181
RTOR Reduction (vph)	0	87	175	0	21	0	0	0	121	0	0	59
Lane Group Flow (vph)	184	617	147	428	601	0	289	507	632	219	1069	122
Confl. Peds. (#/hr)						7			5			13
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4						2			6
Actuated Green, G (s)	20.4	27.3	27.3	19.4	26.3		13.7	35.3	54.7	17.5	39.1	59.5
Effective Green, g (s)	20.4	27.3	27.3	19.4	26.3		13.7	35.3	54.7	17.5	39.1	59.5
Actuated g/C Ratio	0.17	0.23	0.23	0.16	0.22		0.11	0.29	0.46	0.15	0.33	0.50
Clearance Time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	4.0	2.0	2.0	4.0	2.0
Lane Grp Cap (vph)	289	819	409	517	789		365	1059	1641	247	1759	961
v/s Ratio Prot	0.11	c0.17		0.13	c0.17		c0.09	0.14	0.06	c0.13	c0.20	0.02
v/s Ratio Perm			0.08						0.11			0.05
v/c Ratio	0.64	0.75	0.36	0.83	0.76		0.79	0.48	0.39	0.89	0.61	0.13
Uniform Delay, d1	46.4	43.2	39.0	48.7	43.9		51.8	34.8	21.6	50.3	34.0	16.3
Progression Factor	1.00	1.00	1.00	1.05	1.06		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.4	4.0	0.5	9.5	4.1		10.5	1.6	0.1	28.6	1.6	0.0
Delay (s)	49.7	47.2	39.5	60.6	50.7		62.2	36.3	21.6	78.9	35.6	16.3
Level of Service	D	D	D	E	D		E	D	C	E	D	B
Approach Delay (s)		45.5			54.7			34.0			39.7	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	42.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	86.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	173	394	571	402	463	121	272	477	708	206	1005	170
Future Volume (veh/h)	173	394	571	402	463	121	272	477	708	206	1005	170
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	184	387	497	428	493	114	289	507	387	219	1069	111
Adj No. of Lanes	1	1	2	2	2	0	2	2	2	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	284	426	724	475	600	138	390	1010	1221	221	1409	701
Arrive On Green	0.18	0.24	0.24	0.16	0.22	0.22	0.13	0.30	0.30	0.14	0.29	0.29
Sat Flow, veh/h	1619	1800	3060	2956	2757	634	2956	3420	2670	1619	4914	1509
Grp Volume(v), veh/h	184	387	497	428	305	302	289	507	387	219	1069	111
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	1710	1681	1478	1710	1335	1619	1638	1509
Q Serve(g_s), s	12.7	25.1	12.5	17.1	20.4	20.6	11.3	14.7	11.1	16.2	23.8	0.0
Cycle Q Clear(g_c), s	12.7	25.1	12.5	17.1	20.4	20.6	11.3	14.7	11.1	16.2	23.8	0.0
Prop In Lane	1.00		1.00	1.00		0.38	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	284	426	724	475	372	366	390	1010	1221	221	1409	701
V/C Ratio(X)	0.65	0.91	0.69	0.90	0.82	0.83	0.74	0.50	0.32	0.99	0.76	0.16
Avail Cap(c_a), veh/h	284	456	775	517	470	462	390	1010	1221	221	1409	701
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.86	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.0	44.5	20.7	49.4	44.7	44.8	50.1	35.0	20.8	51.7	39.0	18.7
Incr Delay (d2), s/veh	4.0	21.1	2.3	15.2	7.7	8.3	6.5	1.8	0.7	57.4	3.9	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.0	15.0	5.5	8.0	10.4	10.4	5.0	7.2	4.2	10.8	11.3	2.2
LnGrp Delay(d),s/veh	50.0	65.7	23.0	64.6	52.4	53.1	56.6	36.8	21.5	109.1	42.9	19.2
LnGrp LOS	D	E	C	E	D	D	E	D	C	F	D	B
Approach Vol, veh/h		1068			1035			1183			1399	
Approach Delay, s/veh		43.1			57.7			36.6			51.4	
Approach LOS		D			E			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	21.0	41.6	23.9	33.5	22.0	40.6	26.2	31.2				
Change Period (Y+Rc), s	4.6	6.2	4.6	5.1	6.2	* 6.2	5.1	* 5.1				
Max Green Setting (Gmax), s	16.4	31.7	21.0	30.4	13.7	* 34	18.4	* 33				
Max Q Clear Time (g_c+I1), s	18.2	16.7	19.1	27.1	13.3	25.8	14.7	22.6				
Green Ext Time (p_c), s	0.0	6.0	0.2	1.3	0.1	5.4	1.7	2.6				
Intersection Summary												
HCM 2010 Ctrl Delay			47.2									
HCM 2010 LOS			D									
Notes												

Intersection

Int Delay, s/veh 1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↖ ↗	↖ ↗	↖ ↗	
Traffic Vol, veh/h	0	0	357	1481	1381	721
Future Vol, veh/h	0	0	357	1481	1381	721
Conflicting Peds, #/hr	0	0	0	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	0	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	388	1610	1501	784

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	754	1504 0
Stage 1	-	-	- -
Stage 2	-	-	- -
Critical Hdwy	-	7.1	5.3 -
Critical Hdwy Stg 1	-	-	- -
Critical Hdwy Stg 2	-	-	- -
Follow-up Hdwy	-	3.9	3.1 -
Pot Cap-1 Maneuver	0	*615	767 -
Stage 1	0	-	- -
Stage 2	0	-	- -
Platoon blocked, %	-	1	1 -
Mov Cap-1 Maneuver	-	*614	767 -
Mov Cap-2 Maneuver	-	-	- -
Stage 1	-	-	- -
Stage 2	-	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	0	2.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	767	-	-	-	-
HCM Lane V/C Ratio	0.506	-	-	-	-
HCM Control Delay (s)	14.4	-	0	-	-
HCM Lane LOS	B	-	A	-	-
HCM 95th %tile Q(veh)	2.9	-	-	-	-

Notes

-: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations						↗		↕			↕	
Traffic Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Future Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	-	-	-	Free	-	-	-	-	-	None
Storage Length	-	-	-	-	-	0	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	1197	0	988	0	0	739	169

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	0	0	0
Stage 1	0	0	0
Stage 2	0	0	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBTWBLn1	SBT	SBR
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	-	0	-
HCM Lane LOS	-	A	-
HCM 95th %tile Q(veh)	-	-	-

Intersection

Int Delay, s/veh

Movement	NWL	NWR
Lane Configurations		
Traffic Vol, veh/h	0	0
Future Vol, veh/h	0	0
Conflicting Peds, #/hr	0	0
Sign Control	Stop	Stop
RT Channelized	-	-
Storage Length	-	-
Veh in Median Storage, #	0	-
Grade, %	0	-
Peak Hour Factor	96	96
Heavy Vehicles, %	0	0
Mvmt Flow	0	0

Major/Minor

Conflicting Flow All
Stage 1
Stage 2
Critical Hdwy
Critical Hdwy Stg 1
Critical Hdwy Stg 2
Follow-up Hdwy
Pot Cap-1 Maneuver
Stage 1
Stage 2
Platoon blocked, %
Mov Cap-1 Maneuver
Mov Cap-2 Maneuver
Stage 1
Stage 2

Approach

HCM Control Delay, s
HCM LOS

Minor Lane/Major Mvmt

Timings

15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.

3/27/2017

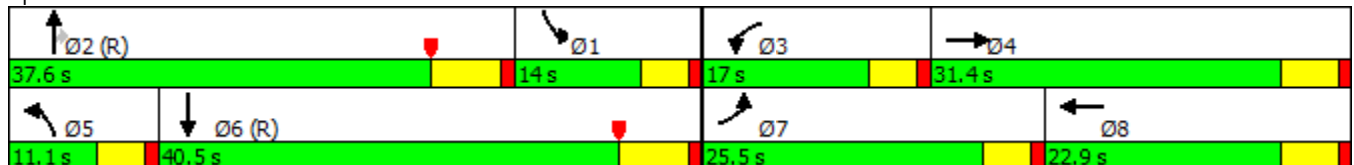


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖↗	↕	↖	↕	↖	↕	↗	↖	↕
Traffic Volume (vph)	497	674	174	363	52	911	85	207	535
Future Volume (vph)	497	674	174	363	52	911	85	207	535
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	9.6	31.4	9.6	15.4	9.6	36.2	36.2	9.6	36.2
Total Split (s)	25.5	31.4	17.0	22.9	11.1	37.6	37.6	14.0	40.5
Total Split (%)	25.5%	31.4%	17.0%	22.9%	11.1%	37.6%	37.6%	14.0%	40.5%
Yellow Time (s)	3.6	4.4	3.6	4.4	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	5.4	4.6	6.2	6.2	4.6	6.2
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)	19.4	25.7	12.2	18.5	6.2	31.9	31.9	9.4	37.1
Actuated g/C Ratio	0.19	0.26	0.12	0.18	0.06	0.32	0.32	0.09	0.37
v/c Ratio	0.85	0.92	0.90	0.80	0.53	0.84	0.13	1.38	0.57
Control Delay	52.9	51.6	85.6	43.4	63.7	40.1	0.4	242.8	25.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.9	51.6	85.6	43.4	63.7	40.1	0.4	242.8	25.9
LOS	D	D	F	D	E	D	A	F	C
Approach Delay		52.1		53.6		38.1			73.9
Approach LOS		D		D		D			E

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.38
 Intersection Signal Delay: 53.8
 Intersection LOS: D
 Intersection Capacity Utilization 92.2%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.

























HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔	↕↔		↔	↕↕	↔	↔	↕↔	
Traffic Volume (vph)	497	674	147	174	363	186	52	911	85	207	535	194
Future Volume (vph)	497	674	147	174	363	186	52	911	85	207	535	194
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.95		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	529	717	156	185	386	198	55	969	90	220	569	206
RTOR Reduction (vph)	0	19	0	0	64	0	0	0	62	0	36	0
Lane Group Flow (vph)	529	854	0	185	520	0	55	969	28	220	739	0
Confl. Peds. (#/hr)			3						1			6
Confl. Bikes (#/hr)			1						1			
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	19.4	25.7		12.2	18.5		5.2	30.9	30.9	10.4	36.1	
Effective Green, g (s)	19.4	25.7		12.2	18.5		5.2	30.9	30.9	10.4	36.1	
Actuated g/C Ratio	0.19	0.26		0.12	0.18		0.05	0.31	0.31	0.10	0.36	
Clearance Time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	620	925		207	666		88	1112	556	176	1299	
v/s Ratio Prot	c0.17	c0.24		0.11	0.14		0.03	c0.27		c0.13	0.21	
v/s Ratio Perm									0.02			
v/c Ratio	0.85	0.92		0.89	0.78		0.62	0.87	0.05	1.25	0.57	
Uniform Delay, d1	38.9	36.2		43.3	38.8		46.4	32.7	24.2	44.8	25.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	10.6	14.5		34.2	5.9		9.6	9.4	0.2	150.7	1.8	
Delay (s)	49.5	50.7		77.5	44.7		56.0	42.1	24.4	195.5	27.5	
Level of Service	D	D		E	D		E	D	C	F	C	
Approach Delay (s)		50.2			52.6			41.4			64.6	
Approach LOS		D			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	51.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.8
Intersection Capacity Utilization	92.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	497	674	147	174	363	186	52	911	85	207	535	194
Future Volume (veh/h)	497	674	147	174	363	186	52	911	85	207	535	194
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	529	717	149	185	386	157	55	969	59	220	569	145
Adj No. of Lanes	2	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	583	731	152	201	446	179	68	1074	474	964	2387	606
Arrive On Green	0.20	0.26	0.26	0.12	0.19	0.19	0.04	0.31	0.31	0.60	0.88	0.88
Sat Flow, veh/h	2956	2812	584	1619	2384	957	1619	3420	1509	1619	2701	686
Grp Volume(v), veh/h	529	436	430	185	275	268	55	969	59	220	360	354
Grp Sat Flow(s),veh/h/ln	1478	1710	1686	1619	1710	1631	1619	1710	1509	1619	1710	1677
Q Serve(g_s), s	17.5	25.3	25.3	11.3	15.6	16.0	3.4	27.1	4.0	6.4	3.1	3.1
Cycle Q Clear(g_c), s	17.5	25.3	25.3	11.3	15.6	16.0	3.4	27.1	4.0	6.4	3.1	3.1
Prop In Lane	1.00		0.35	1.00		0.59	1.00		1.00	1.00		0.41
Lane Grp Cap(c), veh/h	583	445	438	201	320	305	68	1074	474	964	1511	1482
V/C Ratio(X)	0.91	0.98	0.98	0.92	0.86	0.88	0.81	0.90	0.12	0.23	0.24	0.24
Avail Cap(c_a), veh/h	618	445	438	201	320	305	105	1074	474	964	1511	1482
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.86	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.3	36.7	36.8	43.3	39.4	39.5	47.5	32.8	49.1	9.5	0.9	0.9
Incr Delay (d2), s/veh	14.4	34.5	35.0	41.4	20.6	23.9	11.9	12.1	0.5	0.0	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	16.1	16.1	7.3	9.2	9.2	1.7	14.6	1.7	2.8	1.6	1.5
LnGrp Delay(d),s/veh	53.6	71.3	71.8	84.8	60.0	63.4	59.4	45.0	49.7	9.5	1.2	1.2
LnGrp LOS	D	E	E	F	E	E	E	D	D	A	A	A
Approach Vol, veh/h		1395			728			1083			934	
Approach Delay, s/veh		64.7			67.6			46.0			3.2	
Approach LOS		E			E			D			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	66.4	37.6	17.0	31.4	8.8	95.2	24.3	24.1				
Change Period (Y+Rc), s	6.2	* 6.2	4.6	5.4	4.6	6.2	4.6	5.4				
Max Green Setting (Gmax), s	9.4	* 31	12.4	26.0	6.5	34.3	20.9	17.5				
Max Q Clear Time (g_c+I1), s	8.4	29.1	13.3	27.3	5.4	5.1	19.5	18.0				
Green Ext Time (p_c), s	0.1	1.6	0.0	0.0	0.0	6.2	0.2	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			46.4									
HCM 2010 LOS			D									
Notes												

Timings
16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

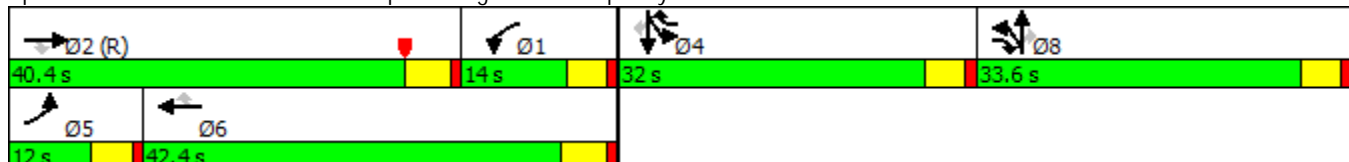


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	415	129	236	217	418	176	620	253	46	742	286
Future Volume (vph)	59	415	129	236	217	418	176	620	253	46	742	286
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	8	1	6	4	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	39.1	33.6	9.6	39.1	22.6	33.6	33.6	33.6	22.6	22.6	22.6
Total Split (s)	12.0	40.4	33.6	14.0	42.4	32.0	33.6	33.6	33.6	32.0	32.0	32.0
Total Split (%)	10.0%	33.7%	28.0%	11.7%	35.3%	26.7%	28.0%	28.0%	28.0%	26.7%	26.7%	26.7%
Yellow Time (s)	3.6	4.1	3.6	3.6	4.1	3.6	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lead	Lead		Lag	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	C-Max	Max	None	None	Max	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	7.0	35.3	69.4	9.4	39.7	67.6	29.0	29.0	29.0	27.4	27.4	27.4
Actuated g/C Ratio	0.06	0.29	0.58	0.08	0.33	0.56	0.24	0.24	0.24	0.23	0.23	0.23
v/c Ratio	0.66	0.43	0.13	1.04	0.35	0.28	0.42	0.80	0.47	0.13	0.99	0.59
Control Delay	90.1	36.3	8.5	120.3	17.4	9.1	42.3	51.1	13.1	38.0	75.8	25.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	90.1	36.3	8.5	120.3	17.4	9.1	42.3	51.1	13.1	38.0	75.8	25.7
LOS	F	D	A	F	B	A	D	D	B	D	E	C
Approach Delay		35.6			43.3			40.6			60.8	
Approach LOS		D			D			D			E	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT, Start of Yellow
 Natural Cycle: 115
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.04
 Intersection Signal Delay: 46.5
 Intersection LOS: D
 Intersection Capacity Utilization 97.9%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)

3/30/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	415	129	236	217	418	176	620	253	46	742	286
Future Volume (vph)	59	415	129	236	217	418	176	620	253	46	742	286
Ideal Flow (vphpl)	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lane Util. Factor	1.00	0.95	1.00	0.97	0.91	0.91	0.91	0.91	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99	0.99	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600	1376	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600	1376	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	65	456	142	259	238	459	193	681	278	51	815	314
RTOR Reduction (vph)	0	0	29	0	144	33	0	0	160	0	0	119
Lane Group Flow (vph)	65	456	113	259	324	196	174	700	118	51	815	195
Confl. Peds. (#/hr)			4			7			2			
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	5.9	34.4	63.4	10.3	38.8	66.2	29.0	29.0	29.0	27.4	27.4	27.4
Effective Green, g (s)	5.9	34.4	63.4	10.3	38.8	66.2	29.0	29.0	29.0	27.4	27.4	27.4
Actuated g/C Ratio	0.05	0.29	0.53	0.09	0.32	0.55	0.24	0.24	0.24	0.23	0.23	0.23
Clearance Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	83	1032	1020	274	1164	759	410	870	435	388	822	411
v/s Ratio Prot	c0.04	c0.13	0.03	c0.08	0.09	0.06	0.10	c0.19		0.03	c0.23	
v/s Ratio Perm			0.04			0.08			0.07			0.11
v/c Ratio	0.78	0.44	0.11	0.95	0.28	0.26	0.42	0.80	0.27	0.13	0.99	0.47
Uniform Delay, d1	56.4	35.0	14.2	54.6	30.2	14.1	38.4	42.8	36.9	36.8	46.2	40.1
Progression Factor	1.16	1.02	1.25	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	30.1	1.2	0.2	39.1	0.1	0.2	3.2	7.8	1.5	0.7	29.4	3.9
Delay (s)	95.8	36.9	17.9	93.7	30.3	14.2	41.6	50.7	38.5	37.5	75.6	44.0
Level of Service	F	D	B	F	C	B	D	D	D	D	E	D
Approach Delay (s)		38.6			43.6			46.4			65.5	
Approach LOS		D			D			D			E	

























Intersection Summary		
HCM 2000 Control Delay	50.1	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.76	D
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	97.9%	18.9
Analysis Period (min)	15	ICU Level of Service
		F

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)

3/30/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	415	129	236	217	418	176	620	253	46	742	286
Future Volume (veh/h)	59	415	129	236	217	418	176	620	253	46	742	286
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	65	456	99	259	238	432	193	681	243	51	815	277
Adj No. of Lanes	1	2	1	2	1	2	1	2	1	1	2	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	81	1006	818	658	835	2078	391	870	369	370	781	349
Arrive On Green	0.02	0.10	0.10	0.22	0.46	0.46	0.24	0.24	0.24	0.23	0.23	0.23
Sat Flow, veh/h	1619	3420	1524	3048	1800	2974	1619	3600	1526	1619	3420	1530
Grp Volume(v), veh/h	65	456	99	259	238	432	193	681	243	51	815	277
Grp Sat Flow(s),veh/h/ln	1619	1710	1524	1524	1800	1487	1619	1800	1526	1619	1710	1530
Q Serve(g_s), s	4.8	15.1	4.7	8.7	9.8	6.3	12.3	21.2	17.2	3.0	27.4	20.5
Cycle Q Clear(g_c), s	4.8	15.1	4.7	8.7	9.8	6.3	12.3	21.2	17.2	3.0	27.4	20.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	81	1006	818	658	835	2078	391	870	369	370	781	349
V/C Ratio(X)	0.80	0.45	0.12	0.39	0.28	0.21	0.49	0.78	0.66	0.14	1.04	0.79
Avail Cap(c_a), veh/h	100	1006	818	658	835	2078	391	870	369	370	781	349
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.75	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.4	45.1	17.9	40.3	19.9	6.6	39.2	42.6	41.0	36.9	46.3	43.6
Incr Delay (d2), s/veh	19.5	1.1	0.2	0.1	0.2	0.0	4.4	7.0	8.9	0.8	44.2	16.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	7.3	3.1	3.7	4.9	4.5	6.0	11.3	8.2	1.4	17.7	10.3
LnGrp Delay(d),s/veh	77.9	46.2	18.2	40.5	20.1	6.7	43.6	49.5	49.9	37.7	90.5	60.4
LnGrp LOS	E	D	B	D	C	A	D	D	D	D	F	E
Approach Vol, veh/h		620			929			1117			1143	
Approach Delay, s/veh		45.0			19.5			48.6			80.8	
Approach LOS		D			B			D			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	31.5	40.4		32.0	10.6	61.3		33.6				
Change Period (Y+Rc), s	5.1	* 5.1		4.6	4.6	5.1		4.6				
Max Green Setting (Gmax), s	9.4	* 35		27.4	7.4	37.3		29.0				
Max Q Clear Time (g_c+I1), s	10.7	17.1		29.4	6.8	11.8		23.2				
Green Ext Time (p_c), s	0.0	3.0		0.0	0.0	3.8		2.8				
Intersection Summary												
HCM 2010 Ctrl Delay			50.6									
HCM 2010 LOS			D									
Notes												

APPENDIX 6.3:

EA (2018) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-3. Warrant 3, Peak Hour

Traffic Conditions = **EA (2018) Conditions - Weekday PM Peak Hour**

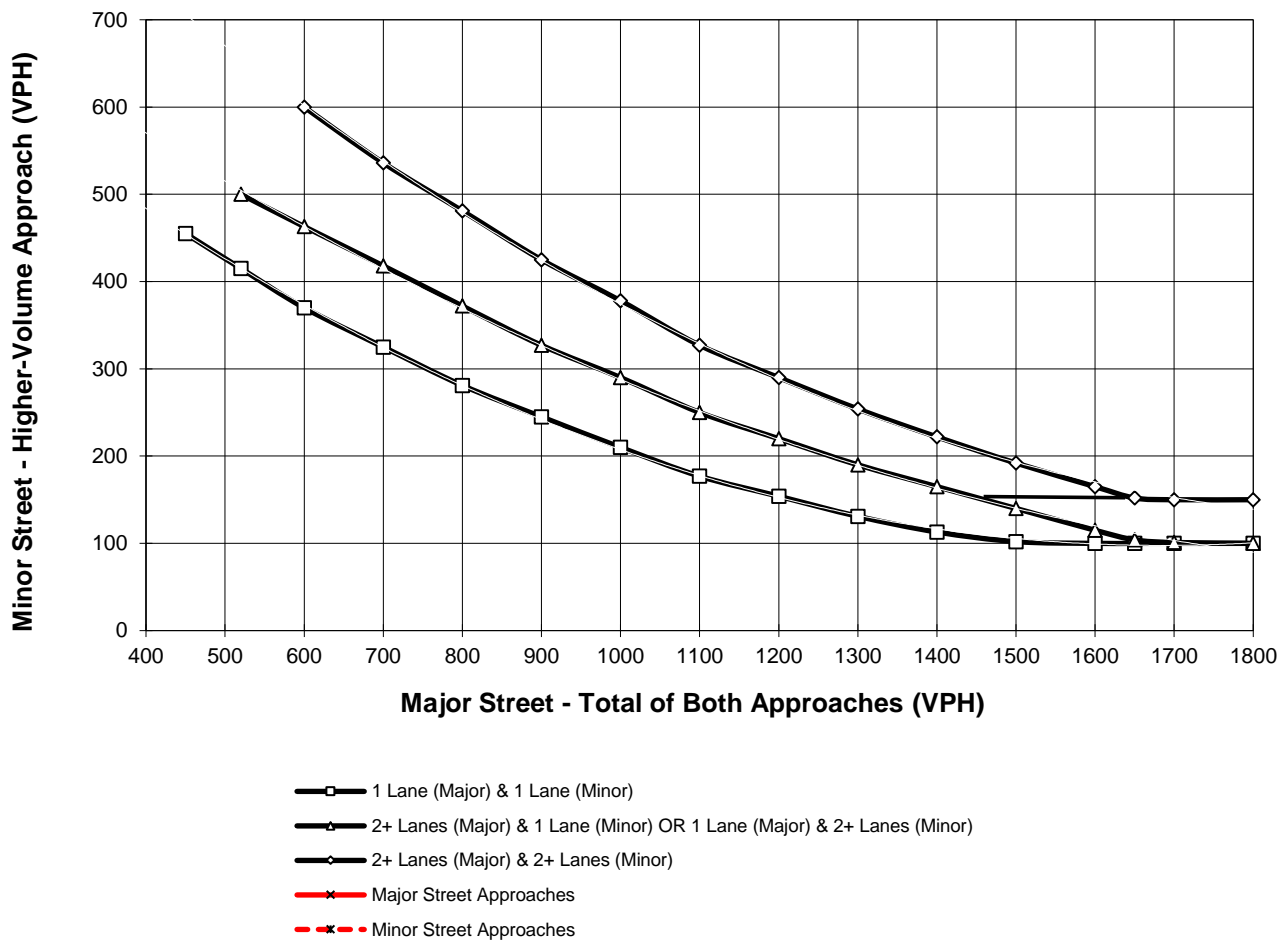
Major Street Name = **Dumas St.**

Total of Both Approaches (VPH) = **18**
 Number of Approach Lanes on Major Street = **1**

Minor Street Name = **Washington Av.**

High Volume Approach (VPH) = **15**
 Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 150 vph applies as the lower threshold for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **EA (2018) Conditions - Weekday AM Peak Hour**

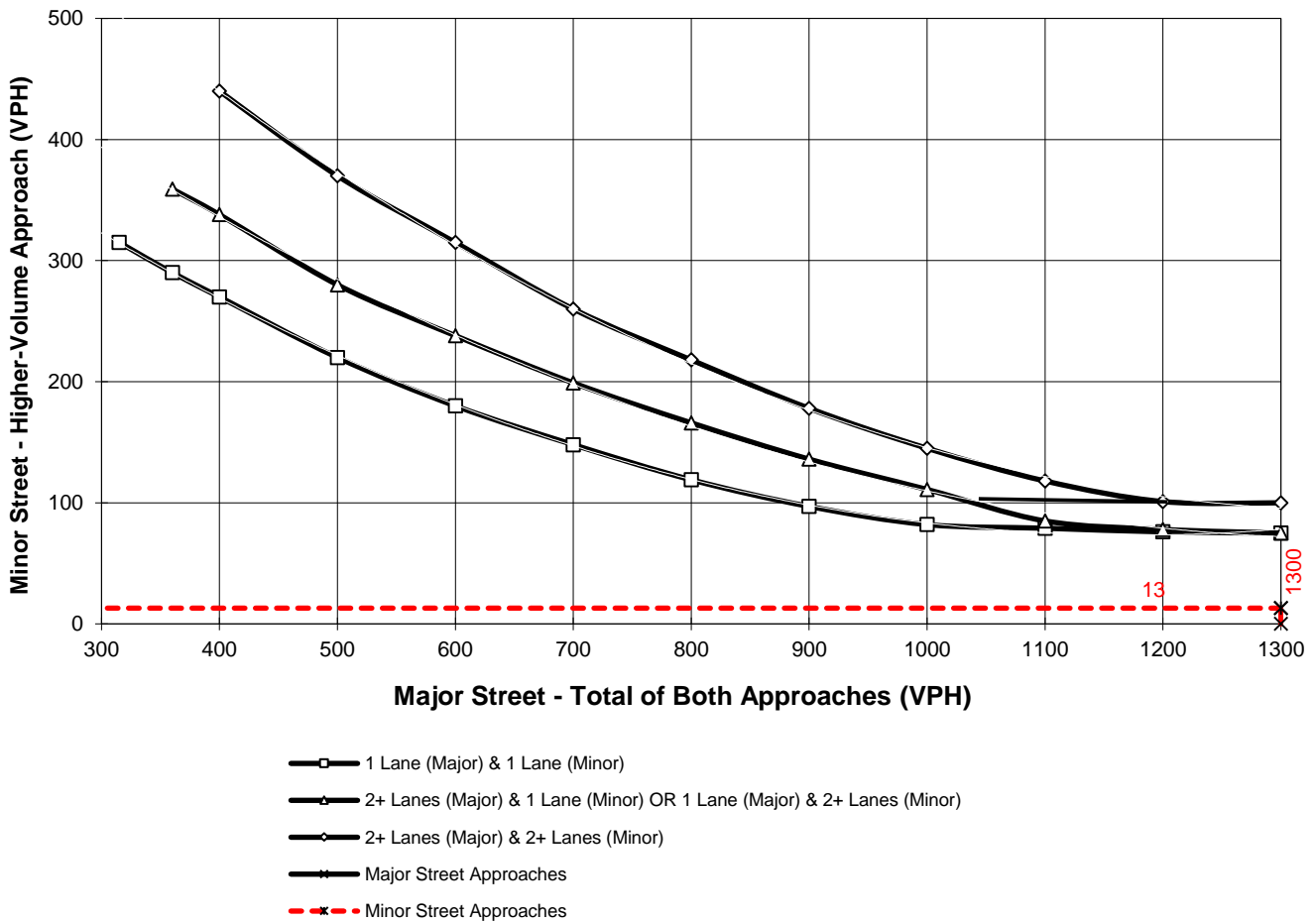
Major Street Name = **Waterman Av.**

Total of Both Approaches (VPH) = **1660**
 Number of Approach Lanes Major Street = **2**

Minor Street Name = **Dumas St.**

High Volume Approach (VPH) = **13**
 Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

APPENDIX 6.4:

EAP (2018) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

<u>DIST</u>	<u>CO</u>	<u>RTE</u>	<u>PM</u>	<u>CALC</u>	<u>TRAFFIC CONDITIONS</u>	<u>EAP (2018)</u>
Jurisdiction: <u>City of San Bernardino</u>				CHK <u>BA</u>	DATE <u>03/28/17</u>	DATE <u>03/28/17</u>
Major Street: <u>Washington Avenue</u>					Critical Approach Speed (Major) <u>25</u> mph	
Minor Street: <u>Driveway 1</u>					Critical Approach Speed (Minor) <u>25</u> mph	

Major Street Approach Lanes = 1 lane Minor Street Approach Lanes: 1 lane

Major Street Future ADT = 670 vpd Minor Street Future ADT = 367 vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph);

or

In built up area of isolated community of < 10,000 population **URBAN (U)**

(Based on Estimated Average Daily Traffic - See Note)

<u>URBAN</u>	<u>RURAL</u>	Minimum Requirements			
XX		EADT			
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street		Vehicles Per Day on Higher-Volume Minor Street Approach	
<u>Satisfied</u>	<u>Not Satisfied</u>	(Total of Both Approaches)		(One Direction Only)	
	XX	<u>Urban</u>	<u>Rural</u>	<u>Urban</u>	<u>Rural</u>
Number of lanes for moving traffic on each approach					
<u>Major Street</u>	<u>Minor Street</u>				
1 670	1 367	8,000	5,600	2,400	1,680
2 +	1	9,600	6,720	2,400	1,680
2 +	2 +	9,600	6,720	3,200	2,240
1	2 +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street		Vehicles Per Day on Higher-Volume Minor Street Approach	
<u>Satisfied</u>	<u>Not Satisfied</u>	(Total of Both Approaches)		(One Direction Only)	
	XX	<u>Urban</u>	<u>Rural</u>	<u>Urban</u>	<u>Rural</u>
Number of lanes for moving traffic on each approach					
<u>Major Street</u>	<u>Minor Street</u>				
1 670	1 367	12,000	8,400	1,200	850
2 +	1	14,400	10,080	1,200	850
2 +	2 +	14,400	10,080	1,600	1,120
1	2 +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B		2 CONDITIONS		2 CONDITIONS	
<u>Satisfied</u>	<u>Not Satisfied</u>	80%		80%	
No one condition satisfied, but following conditions fulfilled 80% of more	XX				
	A				
	8%				
	B				
	6%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.



Figure 4C-3. Warrant 3, Peak Hour

Traffic Conditions = **EAP (2018) Conditions - Weekday PM Peak Hour**

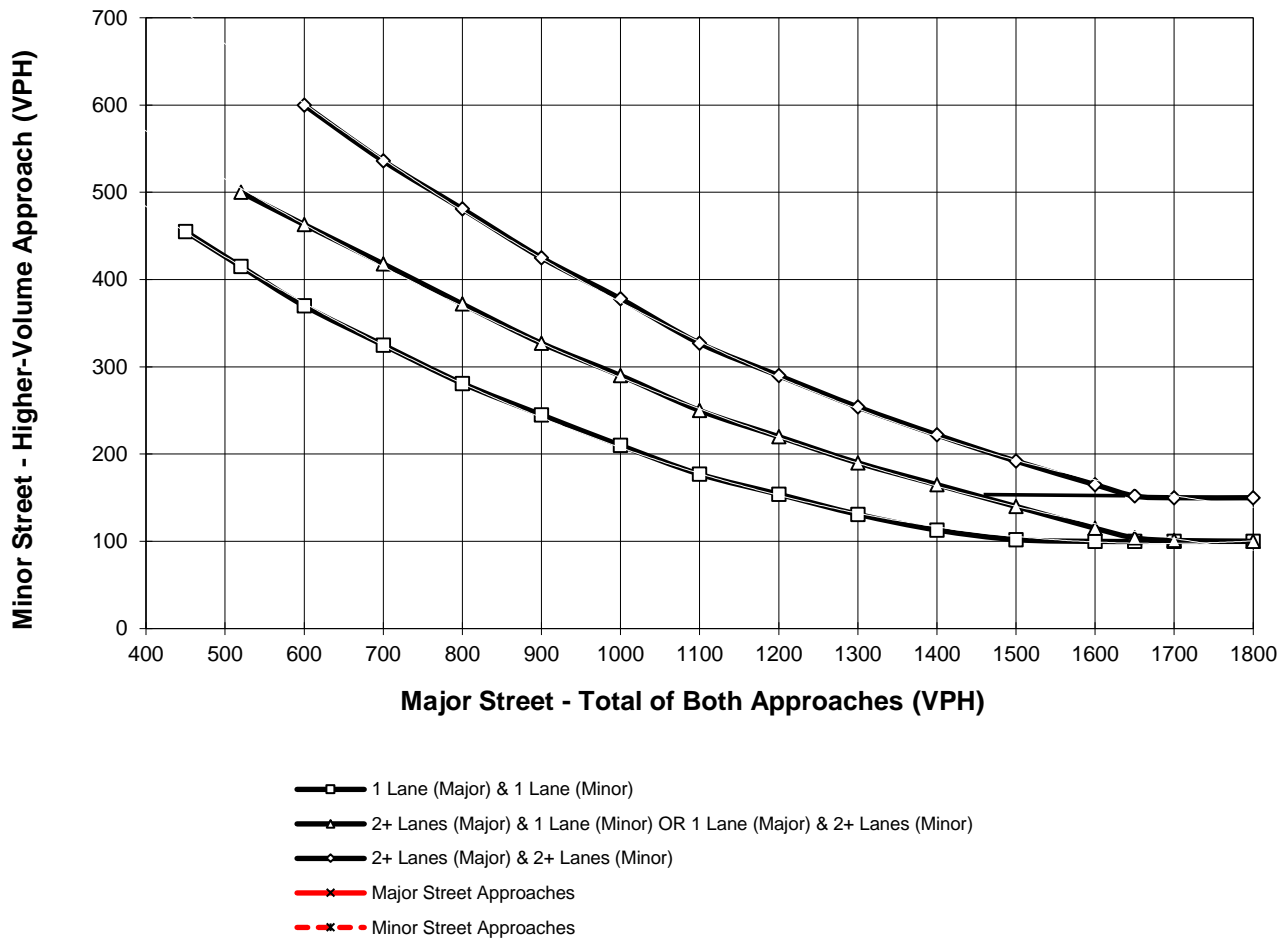
Major Street Name = **Dumas St.**

Total of Both Approaches (VPH) = **15**
 Number of Approach Lanes on Major Street = **1**

Minor Street Name = **Washington Av.**

High Volume Approach (VPH) = **18**
 Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 150 vph applies as the lower threshold for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-3. Warrant 3, Peak Hour

Traffic Conditions = **EAP (2018) (Alternative Access) Conditions - Weekday PM Peak Hour**

Major Street Name = **Washington Av.**

Total of Both Approaches (VPH) = **56**

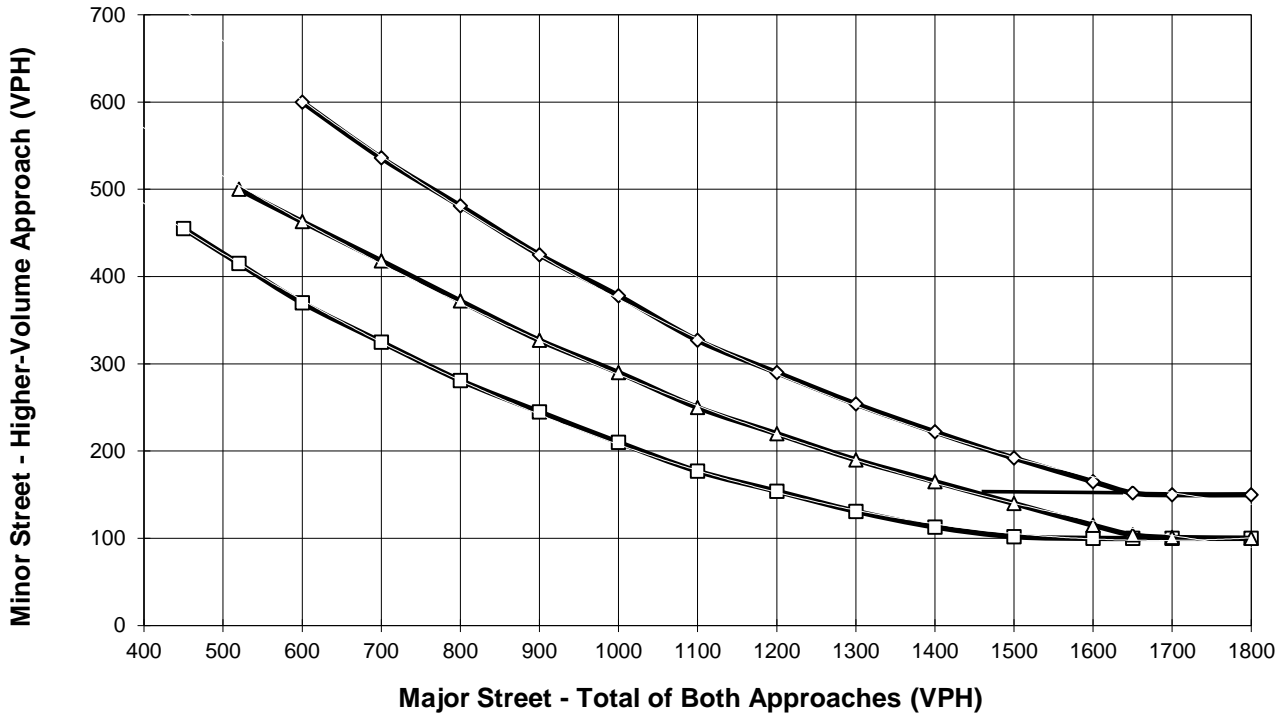
Number of Approach Lanes on Major Street = **1**

Minor Street Name = **Dumas St.**

High Volume Approach (VPH) = **18**

Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



- 1 Lane (Major) & 1 Lane (Minor)
- △— 2+ Lanes (Major) & 1 Lane (Minor) OR 1 Lane (Major) & 2+ Lanes (Minor)
- ◇— 2+ Lanes (Major) & 2+ Lanes (Minor)
- x— Major Street Approaches
- x— Minor Street Approaches

*Note: 150 vph applies as the lower threshold for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold for a minor-street approach with one lane



Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **EAP (2018) Conditions - Weekday AM Peak Hour**

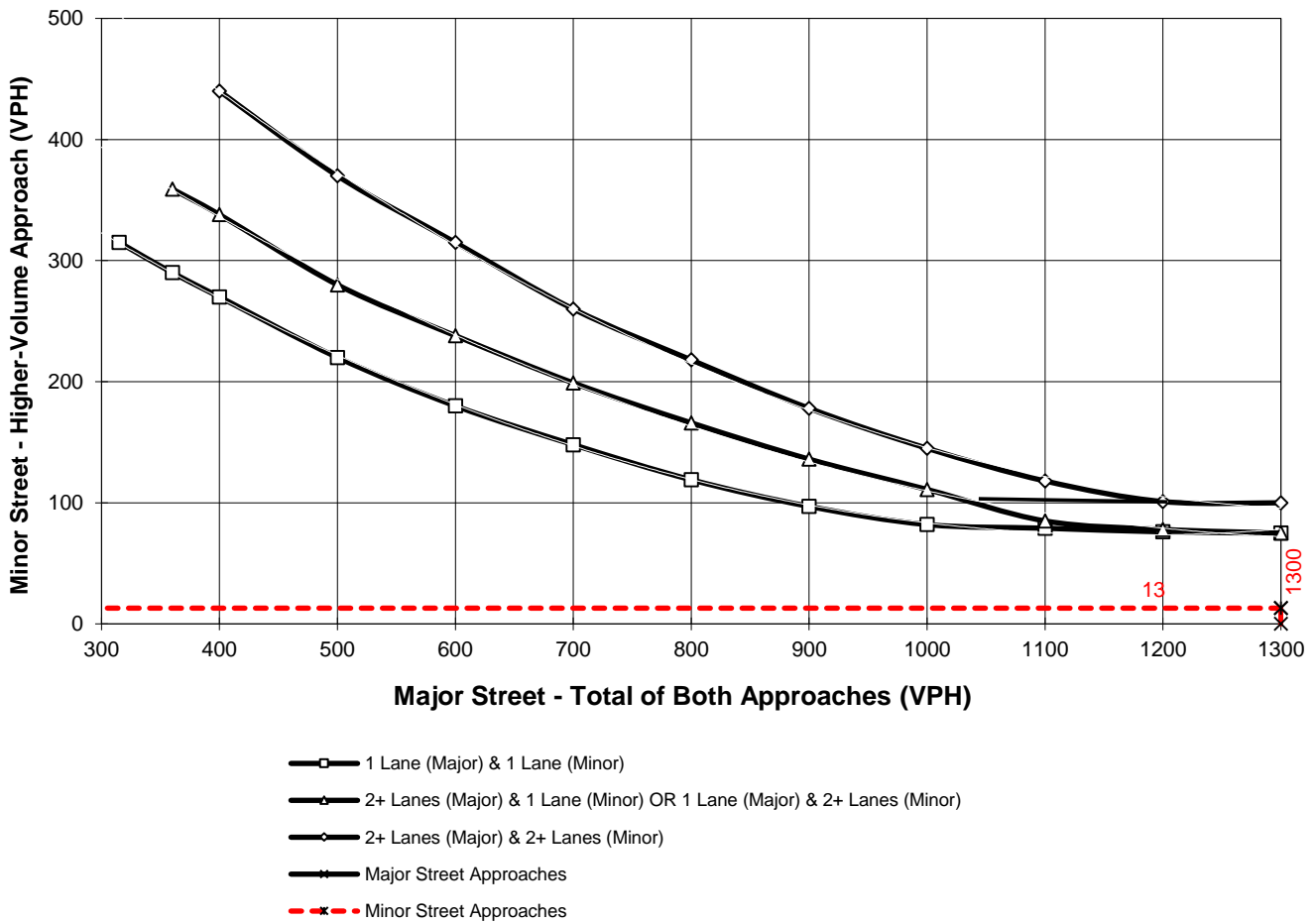
Major Street Name = **Waterman Av.**

Total of Both Approaches (VPH) = **1724**
 Number of Approach Lanes Major Street = **2**

Minor Street Name = **Dumas St.**

High Volume Approach (VPH) = **13**
 Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

APPENDIX 6.5:

EA (2018) CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS

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Queues

1: I-215 SB Ramps & Auto Center Rd.



Lane Group	EBT	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	181	207	602	605	377
v/c Ratio	0.12	0.14	0.85	0.81	0.39
Control Delay	8.8	10.5	30.2	26.2	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	8.8	10.5	30.2	26.2	2.8
Queue Length 50th (ft)	15	28	197	193	0
Queue Length 95th (ft)	32	41	#385	#369	42
Internal Link Dist (ft)	663	209		2403	
Turn Bay Length (ft)					465
Base Capacity (vph)	1521	1500	708	750	969
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.12	0.14	0.85	0.81	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Queues

2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	78	1244	334	281	84	83	951
v/c Ratio	0.46	0.61	0.20	0.28	0.19	0.17	0.92
Control Delay	27.8	8.8	12.3	8.2	18.3	18.1	35.3
Queue Delay	0.0	0.5	0.0	0.0	0.0	0.0	19.8
Total Delay	27.8	9.2	12.3	8.2	18.3	18.1	55.1
Queue Length 50th (ft)	18	230	65	59	24	24	169
Queue Length 95th (ft)	m29	m298	m106	m128	56	55	#291
Internal Link Dist (ft)		295	473			974	
Turn Bay Length (ft)	270			230	315		275
Base Capacity (vph)	178	2040	1687	992	453	480	1034
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	344	0	0	0	0	112
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.73	0.20	0.28	0.19	0.17	1.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.



Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	539	39	460	25	487	502	688
v/c Ratio	0.56	0.38	0.38	0.08	0.54	0.52	0.63
Control Delay	41.4	64.3	31.7	0.5	21.8	21.3	14.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.4	64.3	31.7	0.5	21.8	21.3	14.0
Queue Length 50th (ft)	196	30	142	0	267	272	219
Queue Length 95th (ft)	264	66	190	0	380	384	352
Internal Link Dist (ft)	873		790			811	
Turn Bay Length (ft)		150			100		215
Base Capacity (vph)	969	136	1200	313	909	964	1099
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.29	0.38	0.08	0.54	0.52	0.63

Intersection Summary

Queues

16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

3/24/2017



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	84	184	57	44	715	310	685	191	8	385	84
v/c Ratio	0.28	0.14	0.05	0.25	0.60	0.69	0.72	0.32	0.03	0.65	0.20
Control Delay	42.5	24.9	1.2	53.0	17.6	45.8	41.9	8.5	39.1	49.0	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.5	24.9	1.2	53.0	17.6	45.8	41.9	8.5	39.1	49.0	1.0
Queue Length 50th (ft)	47	46	0	15	104	217	242	13	5	135	0
Queue Length 95th (ft)	110	74	8	34	140	327	312	68	20	187	0
Internal Link Dist (ft)		1015			1164		440			335	
Turn Bay Length (ft)	85		270	250		800		160	110		110
Base Capacity (vph)	310	1309	1174	212	1504	448	949	597	278	589	430
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.14	0.05	0.21	0.48	0.69	0.72	0.32	0.03	0.65	0.20

Intersection Summary

Queues

1: I-215 SB Ramps & Auto Center Rd.



Lane Group	EBT	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	656	349	351	352	288
v/c Ratio	0.41	0.23	0.50	0.48	0.32
Control Delay	10.6	6.3	16.3	15.7	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.6	6.3	16.3	15.7	2.8
Queue Length 50th (ft)	65	22	95	94	0
Queue Length 95th (ft)	102	26	166	162	37
Internal Link Dist (ft)	663	209		2403	
Turn Bay Length (ft)					465
Base Capacity (vph)	1594	1524	697	738	907
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.41	0.23	0.50	0.48	0.32

Intersection Summary



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	234	809	868	666	64	64	951
v/c Ratio	1.31	0.40	0.60	0.59	0.14	0.13	0.81
Control Delay	199.5	5.0	11.9	3.8	17.8	17.7	21.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.7
Total Delay	199.5	5.0	11.9	3.8	17.8	17.7	21.7
Queue Length 50th (ft)	~103	24	122	51	18	18	125
Queue Length 95th (ft)	#227	52	m174	m92	45	45	#209
Internal Link Dist (ft)		295	473			974	
Turn Bay Length (ft)	270			230	315		275
Base Capacity (vph)	178	2040	1452	1123	453	480	1174
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	174	0	0	0	0	56
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.31	0.43	0.60	0.59	0.14	0.13	0.85

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Queues

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.



Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	719	24	625	69	344	348	419
v/c Ratio	0.51	0.29	0.39	0.28	0.50	0.48	0.45
Control Delay	30.1	64.2	23.1	2.9	30.7	30.0	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.1	64.2	23.1	2.9	30.7	30.0	6.7
Queue Length 50th (ft)	232	18	167	0	212	213	35
Queue Length 95th (ft)	296	47	214	0	311	308	110
Internal Link Dist (ft)	873		790			811	
Turn Bay Length (ft)		150			100		215
Base Capacity (vph)	1413	90	1608	327	685	726	933
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.27	0.39	0.21	0.50	0.48	0.45

Intersection Summary

Queues
16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	65	456	133	259	690	167	700	278	51	815	299
v/c Ratio	0.66	0.43	0.12	1.04	0.47	0.41	0.80	0.47	0.13	0.99	0.57
Control Delay	90.1	36.3	8.2	120.3	13.4	41.9	51.1	13.1	38.0	75.8	24.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	90.1	36.3	8.2	120.3	13.4	41.9	51.1	13.1	38.0	75.8	24.8
Queue Length 50th (ft)	52	140	36	~110	82	119	281	41	32	333	101
Queue Length 95th (ft)	m#91	m177	m63	#198	139	194	357	119	67	#470	195
Internal Link Dist (ft)		1015			1164		440			335	
Turn Bay Length (ft)	85		270	250		800		160	110		110
Base Capacity (vph)	104	1059	1066	250	1471	410	870	595	388	822	525
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.43	0.12	1.04	0.47	0.41	0.80	0.47	0.13	0.99	0.57

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

APPENDIX 6.6:

EAP (2018) CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS

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Queues

1: I-215 SB Ramps & Auto Center Rd.



Lane Group	EBT	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	183	208	616	617	377
v/c Ratio	0.12	0.14	0.87	0.82	0.39
Control Delay	8.9	10.2	32.2	27.4	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	8.9	10.2	32.2	27.4	2.8
Queue Length 50th (ft)	16	27	205	198	0
Queue Length 95th (ft)	32	40	#396	#382	42
Internal Link Dist (ft)	663	209		2403	
Turn Bay Length (ft)					465
Base Capacity (vph)	1521	1500	708	750	969
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.12	0.14	0.87	0.82	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Queues

2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	78	1273	348	292	84	83	981
v/c Ratio	0.46	0.62	0.21	0.29	0.19	0.17	0.95
Control Delay	27.9	8.9	11.6	7.5	18.3	18.1	39.9
Queue Delay	0.0	0.6	0.0	0.0	0.0	0.0	29.5
Total Delay	27.9	9.5	11.6	7.5	18.3	18.1	69.4
Queue Length 50th (ft)	18	237	75	16	24	24	178
Queue Length 95th (ft)	m28	m302	m117	m141	56	55	#306
Internal Link Dist (ft)		295	473			974	
Turn Bay Length (ft)	270			230	315		275
Base Capacity (vph)	178	2040	1687	998	453	480	1033
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	372	0	0	0	0	112
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.76	0.21	0.29	0.19	0.17	1.07

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.



Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	539	39	460	25	487	502	688
v/c Ratio	0.56	0.38	0.38	0.08	0.54	0.52	0.63
Control Delay	41.4	64.3	31.7	0.5	21.8	21.3	14.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.4	64.3	31.7	0.5	21.8	21.3	14.0
Queue Length 50th (ft)	196	30	142	0	267	272	219
Queue Length 95th (ft)	264	66	190	0	380	384	352
Internal Link Dist (ft)	873		790			811	
Turn Bay Length (ft)		150			100		215
Base Capacity (vph)	969	136	1200	313	909	964	1099
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.29	0.38	0.08	0.54	0.52	0.63

Intersection Summary

Queues

16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

3/24/2017



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	84	184	60	44	729	320	687	191	8	385	89
v/c Ratio	0.29	0.14	0.05	0.25	0.61	0.71	0.72	0.32	0.03	0.65	0.21
Control Delay	42.8	24.9	1.3	53.0	18.0	46.9	42.0	8.5	39.1	49.0	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.8	24.9	1.3	53.0	18.0	46.9	42.0	8.5	39.1	49.0	1.1
Queue Length 50th (ft)	48	46	0	15	110	225	243	13	5	135	0
Queue Length 95th (ft)	110	74	9	34	145	338	314	68	20	187	0
Internal Link Dist (ft)		1015			1164		440			335	
Turn Bay Length (ft)	85		270	250		800		160	110		110
Base Capacity (vph)	306	1309	1174	212	1504	448	949	597	278	589	430
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.14	0.05	0.21	0.48	0.71	0.72	0.32	0.03	0.65	0.21

Intersection Summary

Queues

1: I-215 SB Ramps & Auto Center Rd.



Lane Group	EBT	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	657	351	352	363	288
v/c Ratio	0.41	0.23	0.51	0.49	0.32
Control Delay	10.6	6.3	16.3	15.9	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.6	6.3	16.3	15.9	2.8
Queue Length 50th (ft)	65	21	95	97	0
Queue Length 95th (ft)	102	27	166	168	37
Internal Link Dist (ft)	663	209		2403	
Turn Bay Length (ft)					465
Base Capacity (vph)	1593	1524	697	738	907
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.41	0.23	0.51	0.49	0.32

Intersection Summary



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	234	822	904	695	64	64	966
v/c Ratio	1.31	0.40	0.62	0.61	0.14	0.13	0.83
Control Delay	199.4	5.0	12.8	4.5	17.8	17.7	22.2
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	1.2
Total Delay	199.4	5.0	12.8	4.5	17.8	17.7	23.3
Queue Length 50th (ft)	~103	24	145	78	18	18	130
Queue Length 95th (ft)	#228	53	m174	m93	45	45	#235
Internal Link Dist (ft)		295	473			974	
Turn Bay Length (ft)	270			230	315		275
Base Capacity (vph)	178	2040	1452	1140	453	480	1168
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	204	0	0	0	0	67
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.31	0.45	0.62	0.61	0.14	0.13	0.88

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Queues

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.



Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	719	24	625	69	344	348	419
v/c Ratio	0.51	0.29	0.39	0.28	0.50	0.48	0.45
Control Delay	30.1	64.2	23.1	2.9	30.7	30.0	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.1	64.2	23.1	2.9	30.7	30.0	6.7
Queue Length 50th (ft)	232	18	167	0	212	213	35
Queue Length 95th (ft)	296	47	214	0	311	308	110
Internal Link Dist (ft)	873		790			811	
Turn Bay Length (ft)		150			100		215
Base Capacity (vph)	1413	90	1608	327	685	726	933
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.27	0.39	0.21	0.50	0.48	0.45

Intersection Summary

Queues
 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	65	456	142	259	697	174	700	278	51	815	314
v/c Ratio	0.66	0.43	0.13	1.04	0.47	0.42	0.80	0.47	0.13	0.99	0.59
Control Delay	90.1	36.3	8.5	120.3	13.3	42.3	51.1	13.1	38.0	75.8	25.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	90.1	36.3	8.5	120.3	13.3	42.3	51.1	13.1	38.0	75.8	25.7
Queue Length 50th (ft)	52	140	40	~110	83	125	281	41	32	333	109
Queue Length 95th (ft)	m#91	m177	m68	#198	140	203	357	119	67	#470	207
Internal Link Dist (ft)		1015			1164		440			335	
Turn Bay Length (ft)	85		270	250		800		160	110		110
Base Capacity (vph)	104	1059	1066	250	1475	410	870	595	388	822	529
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.43	0.13	1.04	0.47	0.42	0.80	0.47	0.13	0.99	0.59

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

APPENDIX 6.7:

EA (2018) CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS

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BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Northbound
Agency or Company	Urban Crossroads, Inc.	From/To	North of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	EA (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
Flow Inputs			
Volume, V	5486	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			3
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain: Level
			Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.985
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	1513	Design LOS	
S	68.9	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	22.0	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Northbound
Agency or Company	Urban Crossroads, Inc.	From/To	South of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	EA (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
Flow Inputs			
Volume, V	7142	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			3
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.985
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1970	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	63.1	x f _p)	
D = v _p / S	31.2	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Southbound
Agency or Company	Urban Crossroads, Inc.	From/To	North of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	EA (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6827	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			4
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
1514	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	68.9	x f _p)	
S	mph	S	mph
D = v _p / S	22.0	D = v _p / S	pc/mi/ln
22.0	pc/mi/ln	Required Number of Lanes, N	
LOS	C		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Southbound
Agency or Company	Urban Crossroads, Inc.	From/To	South of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	EA (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6783	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			4
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain: Level
			Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
1504	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	68.9	x f _p)	
D = v _p / S	21.8	S	
LOS	C	D = v _p / S	
		pc/mi/ln	
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Eastbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	EA (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	7441	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			10
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.952
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2123	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	60.1	x f _p)	
mph		S	mph
D = v _p / S	35.3	D = v _p / S	pc/mi/ln
pc/mi/ln		Required Number of Lanes, N	
LOS	E		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Eastbound
Agency or Company	Urban Crossroads, Inc.	From/To	East of Waterman
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	EA (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6713	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			11
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.948
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
1540	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	68.7	x f _p)	
mph		S	
D = v _p / S	22.4	mph	
pc/mi/ln		D = v _p / S	
LOS	C	pc/mi/ln	
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Westbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	EA (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8042	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			15
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.930
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2349	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	54.7	x f _p)	
mph		S	
D = v _p / S	43.0	mph	
pc/mi/ln		D = v _p / S	
LOS	E	pc/mi/ln	
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel <i>I-10 Westbound</i>	
Agency or Company	<i>Urban Crossroads, Inc.</i>	From/To	<i>East of Waterman</i>
Date Performed	<i>3/20/2017</i>	Jurisdiction	<i>Caltrans</i>
Analysis Time Period	<i>AM Peak Hour</i>	Analysis Year	<i>EA (2018)</i>
Project Description <i>Gateway South Building 4 TIA (JN 10187)</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8705	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			14
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			<i>Level</i>
			Grade % Length
			<i>mi</i>
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	
0.935			
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2531	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	49.4	x f _p)	
mph		S	mph
D = v _p / S	51.2	D = v _p / S	pc/mi/ln
pc/mi/ln		Required Number of Lanes, N	
LOS	F		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Northbound
Agency or Company	Urban Crossroads, Inc.	From/To	North of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	EA (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
Flow Inputs			
Volume, V	6719	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			1
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain: Level
			Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.995
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1835	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	65.3	x f _p)	
D = v _p / S	28.1	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Northbound
Agency or Company	Urban Crossroads, Inc.	From/To	South of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	EA (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	7761	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			2
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2130	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	60.0	x f _p)	
S	mph	S	mph
D = v _p / S	35.5	D = v _p / S	pc/mi/ln
35.5	pc/mi/ln	Required Number of Lanes, N	
LOS	E		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Southbound
Agency or Company	Urban Crossroads, Inc.	From/To	North of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	EA (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	5635	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			2
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
1237	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	70.0	x f _p)	
S	mph	S	mph
D = v _p / S	17.7	D = v _p / S	pc/mi/ln
17.7	pc/mi/ln	Required Number of Lanes, N	
LOS	B		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Southbound
Agency or Company	Urban Crossroads, Inc.	From/To	South of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	EA (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	8412	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			3
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain: Level
			Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.985
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1856	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	65.0	x f _p)	
D = v _p / S	28.6	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Eastbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	EA (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6541	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			8
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.962
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
1849	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	65.1	x f _p)	
mph		S	mph
D = v _p / S	28.4	D = v _p / S	pc/mi/ln
pc/mi/ln		Required Number of Lanes, N	
LOS	D		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel <i>I-10 Eastbound</i>	
Agency or Company	<i>Urban Crossroads, Inc.</i>	From/To	<i>East of Waterman</i>
Date Performed	<i>3/20/2017</i>	Jurisdiction	<i>Caltrans</i>
Analysis Time Period	<i>PM Peak Hour</i>	Analysis Year	<i>EA (2018)</i>
Project Description <i>Gateway South Building 4 TIA (JN 10187)</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6722	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			8
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			<i>Level</i>
			Grade % Length
			<i>mi</i>
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	
0.962			
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
1520	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	68.8	x f _p)	
S	mph	S	mph
D = v _p / S	22.1	D = v _p / S	pc/mi/ln
pc/mi/ln		Required Number of Lanes, N	
LOS	C		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Westbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	EA (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	7997	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			17
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.922
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2358	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	54.4	x f _p)	
S	mph	S	mph
D = v _p / S	43.3	D = v _p / S	pc/mi/ln
43.3	pc/mi/ln	Required Number of Lanes, N	
LOS	E		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel <i>I-10 Westbound</i>	
Agency or Company	<i>Urban Crossroads, Inc.</i>	From/To	<i>East of Waterman</i>
Date Performed	<i>3/20/2017</i>	Jurisdiction	<i>Caltrans</i>
Analysis Time Period	<i>PM Peak Hour</i>	Analysis Year	<i>EA (2018)</i>
Project Description <i>Gateway South Building 4 TIA (JN 10187)</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	7226	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			18
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			<i>Level</i>
			Grade % Length
			<i>mi</i>
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	
0.917			
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2140	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	59.8	x f _p)	
S	mph	S	mph
D = v _p / S	35.8	D = v _p / S	pc/mi/ln
35.8	pc/mi/ln	Required Number of Lanes, N	
LOS	E		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

APPENDIX 6.8:

EAP (2018) CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS

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BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Northbound
Agency or Company	Urban Crossroads, Inc.	From/To	North of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	EAP (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	5496	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			3
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.985
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)		Design LOS	
1516	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	
S	68.8	mph	pc/h/ln
D = v _p / S	22.0	pc/mi/ln	S
LOS	C	D = v _p / S	
		pc/mi/ln	
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Northbound
Agency or Company	Urban Crossroads, Inc.	From/To	South of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	EAP (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	7170	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			3
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.985
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
1978	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	63.0	x f _p)	
S	mph	S	mph
D = v _p / S	31.4	D = v _p / S	pc/mi/ln
D	pc/mi/ln	Required Number of Lanes, N	
LOS	D		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Southbound
Agency or Company	Urban Crossroads, Inc.	From/To	North of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	EAP (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	6851	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			4
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	1519	Design LOS	
S	68.8	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	22.1	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Southbound
Agency or Company	Urban Crossroads, Inc.	From/To	South of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	EAP (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	6795	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			4
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	1507	Design LOS	
S	68.9	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	21.9	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Eastbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	EAP (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	7468	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			10
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.952
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2131	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	59.9	x f _p)	
S	mph	S	mph
D = v _p / S	35.5	D = v _p / S	pc/mi/ln
35.5	pc/mi/ln	Required Number of Lanes, N	
LOS	E		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Eastbound
Agency or Company	Urban Crossroads, Inc.	From/To	East of Waterman
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	EAP (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	6723	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			11
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.948
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1542	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	68.6	x f _p)	
D = v _p / S	22.5	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Westbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	4/3/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	EAP (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8048	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			15
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.930
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2351	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	54.6	x f _p)	
mph		S	
D = v _p / S	43.0	mph	
pc/mi/ln		D = v _p / S	
LOS	E	pc/mi/ln	
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel <i>I-10 Westbound</i>	
Agency or Company	<i>Urban Crossroads, Inc.</i>	From/To	<i>East of Waterman</i>
Date Performed	<i>3/20/2017</i>	Jurisdiction	<i>Caltrans</i>
Analysis Time Period	<i>AM Peak Hour</i>	Analysis Year	<i>EAP (2018)</i>
Project Description <i>Gateway South Building 4 TIA (JN 10187)</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8729	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			14
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			<i>Level</i>
			Grade % Length
			<i>mi</i>
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	
0.935			
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2538	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	49.2	x f _p)	
mph		S	mph
D = v _p / S	51.6	D = v _p / S	pc/mi/ln
pc/mi/ln		Required Number of Lanes, N	
LOS	F		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Northbound
Agency or Company	Urban Crossroads, Inc.	From/To	North of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	EAP (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
Flow Inputs			
Volume, V	6747	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			1
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain: Level
			Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.995
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1843	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	65.2	x f _p)	
D = v _p / S	28.3	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Northbound
Agency or Company	Urban Crossroads, Inc.	From/To	South of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	EAP (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	7776	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			2
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain: Level
			Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2134	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	59.9	x f _p)	
S	mph	S	mph
D = v _p / S	35.6	D = v _p / S	pc/mi/ln
35.6	pc/mi/ln	Required Number of Lanes, N	
LOS	E		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Southbound
Agency or Company	Urban Crossroads, Inc.	From/To	North of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	EAP (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	5647	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			2
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain: Level
			Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1240	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	70.0	x f _p)	
D = v _p / S	17.7	S	mph
LOS	B	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET																				
General Information			Site Information																	
Analyst	BA		Highway/Direction of Travel	I-215 Southbound																
Agency or Company	Urban Crossroads, Inc.		From/To	South of Auto Center																
Date Performed	3/20/2017		Jurisdiction	Caltrans																
Analysis Time Period	PM Peak Hour		Analysis Year	EAP (2018)																
Project Description Gateway South Building 4 TIA (JN 10187)																				
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data																
Flow Inputs																				
Volume, V	8445	veh/h	Peak-Hour Factor, PHF	0.92																
AADT		veh/day	%Trucks and Buses, P _T	3																
Peak-Hr Prop. of AADT, K			%RVs, P _R	0																
Peak-Hr Direction Prop, D			General Terrain:	Level																
DDHV = AADT x K x D		veh/h	Grade % Length	mi																
			Up/Down %																	
Calculate Flow Adjustments																				
f _p	1.00		E _R	1.2																
E _T	1.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.985																
Speed Inputs			Calc Speed Adj and FFS																	
Lane Width		ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f_{LW}</td> <td style="padding: 5px;"></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f_{LC}</td> <td style="padding: 5px;"></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;"></td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;">70.0</td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">Base free-flow Speed, BFFS</td> <td style="padding: 5px;"></td> <td style="padding: 5px;">mph</td> </tr> </table>			f _{LW}		mph	f _{LC}		mph	TRD Adjustment		mph	FFS	70.0	mph	Base free-flow Speed, BFFS		mph
f _{LW}		mph																		
f _{LC}		mph																		
TRD Adjustment		mph																		
FFS	70.0	mph																		
Base free-flow Speed, BFFS		mph																		
Rt-Side Lat. Clearance		ft																		
Number of Lanes, N	5																			
Total Ramp Density, TRD		ramps/mi																		
FFS (measured)	70.0	mph																		
Base free-flow Speed, BFFS		mph																		
LOS and Performance Measures			Design (N)																	
<u>Operational (LOS)</u>			<u>Design (N)</u>																	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1863	pc/h/ln	Design LOS																	
S	64.9	mph	v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln																
D = v _p / S	28.7	pc/mi/ln	S	mph																
LOS	D		D = v _p / S	pc/mi/ln																
			Required Number of Lanes, N																	
Glossary			Factor Location																	
N - Number of lanes	S - Speed																			
V - Hourly volume	D - Density	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8																	
v _p - Flow rate	FFS - Free-flow speed	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9																	
LOS - Level of service	BFFS - Base free-flow speed	f _p - Page 11-18	TRD - Page 11-11																	
DDHV - Directional design hour volume		LOS, S, FFS, v _p - Exhibits 11-2, 11-3																		

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Eastbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	EAP (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
Flow Inputs			
Volume, V	6556	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			8
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain: Level
			Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.962
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1853	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	65.1	x f _p)	
D = v _p / S	28.5	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Eastbound
Agency or Company	Urban Crossroads, Inc.	From/To	East of Waterman
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	EAP (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6751	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			8
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.962
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1526	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	68.8	x f _p)	
D = v _p / S	22.2	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Westbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	4/3/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	EAP (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8014	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			17
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.922
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2363	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	54.3	x f _p)	
mph		S	
D = v _p / S	43.5	mph	
pc/mi/ln		D = v _p / S	
LOS	E	pc/mi/ln	
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel <i>I-10 Westbound</i>	
Agency or Company	<i>Urban Crossroads, Inc.</i>	From/To	<i>East of Waterman</i>
Date Performed	<i>3/20/2017</i>	Jurisdiction	<i>Caltrans</i>
Analysis Time Period	<i>PM Peak Hour</i>	Analysis Year	<i>EAP (2018)</i>
Project Description <i>Gateway South Building 4 TIA (JN 10187)</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	7239	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			18
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	
0.917			
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph	mph	
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2144	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	59.7	x f _p)	
mph		S	mph
D = v _p / S	35.9	D = v _p / S	pc/mi/ln
pc/mi/ln		Required Number of Lanes, N	
LOS	E		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

APPENDIX 6.9:

EA (2018) CONDITIONS RAMP JUNCTION ANALYSIS WORKSHEETS

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RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound						
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Auto Center						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	EA (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp						
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On						
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	240	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off						
L _{up} = 1840 ft	Deceleration Lane Length L _D		L _{down} = ft						
V _u = 974 veh/h	Freeway Volume, V _F	5214	V _D = veh/h						
	Ramp Volume, V _R	272							
	Freeway Free-Flow Speed, S _{FF}	65.0							
	Ramp Free-Flow Speed, S _{FR}	45.0							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5214	0.92	Level	2	0	0.990	1.00	5724	
Ramp	272	0.92	Level	19	0	0.913	1.00	324	
UpStream	974	0.92	Level	2	0	0.990	1.00	1069	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.177 using Equation (Exhibit 13-6) V ₁₂ = 1015 pc/h V ₃ or V _{av34} = 2354 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2289 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity	LOS F?			Actual	Capacity	LOS F?	
V _{FO}	6048	Exhibit 13-8	No		V _F	Exhibit 13-8			
					V _{FO} = V _F - V _R	Exhibit 13-8			
					V _R	Exhibit 13-10			
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}	2613	Exhibit 13-8	4600:All		No	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 24.2 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = 0.353 (Exhibit 13-11)					D _s = (Exhibit 13-12)				
S _R = 56.9 mph (Exhibit 13-11)					S _R = mph (Exhibit 13-12)				
S ₀ = 60.6 mph (Exhibit 13-11)					S ₀ = mph (Exhibit 13-12)				
S = 58.9 mph (Exhibit 13-13)					S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound							
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center							
Date Performed	3/20/2017	Jurisdiction	Caltrans							
Analysis Time Period	AM Peak Hour	Analysis Year	EA (2018)							
Project Description Gateway South Building 4 TIA (JN 10187)										
Inputs										
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	4	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Ramp Number of Lanes, N	2	L _{down} =	1260 ft	Freeway Volume, V _F	6188	
L _{up} =	ft	Acceleration Lane Length, L _A		Deceleration Lane Length L _D	975	V _D =	974 veh/h	Ramp Volume, V _R	954	
V _u =	veh/h	Freeway Free-Flow Speed, S _{FF}		Ramp Free-Flow Speed, S _{FR}	45.0			Freeway Free-Flow Speed, S _{FF}	65.0	
								Ramp Free-Flow Speed, S _{FR}	45.0	
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	6188	0.92	Level	2	0	0.990	1.00	6793		
Ramp	954	0.92	Level	5	0	0.976	1.00	1063		
UpStream										
DownStream	974	0.92	Level	2	0	0.990	1.00	1069		
Merge Areas					Diverge Areas					
Estimation of v ₁₂					Estimation of v ₁₂					
L _{EQ} =	V ₁₂ = V _F (P _{FM}) (Equation 13-6 or 13-7)				L _{EQ} =	V ₁₂ = V _R + (V _F - V _R)P _{FD} (Equation 13-12 or 13-13)				
P _{FM} =	using Equation (Exhibit 13-6)				P _{FD} =	0.260 using Equation (Exhibit 13-7)				
V ₁₂ =	pc/h				V ₁₂ =	2553 pc/h				
V ₃ or V _{av34}	pc/h (Equation 13-14 or 13-17)				V ₃ or V _{av34}	2120 pc/h (Equation 13-14 or 13-17)				
Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, V _{12a} =	pc/h (Equation 13-16, 13-18, or 13-19)				If Yes, V _{12a} =	2717 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 13-8			V _F	6793	Exhibit 13-8		9400	No
					V _{FO} = V _F - V _R	5730	Exhibit 13-8		9400	No
					V _R	1063	Exhibit 13-10		4200	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	2553	Exhibit 13-8		4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
D _R =	5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A				D _R =	4.252 + 0.0086 V ₁₂ - 0.009 L _D				
D _R =	(pc/mi/ln)				D _R =	8.5 (pc/mi/ln)				
LOS =	(Exhibit 13-2)				LOS =	A (Exhibit 13-2)				
Speed Determination					Speed Determination					
M _S =	(Exhibit 13-11)				D _S =	0.394 (Exhibit 13-12)				
S _R =	mph (Exhibit 13-11)				S _R =	55.9 mph (Exhibit 13-12)				
S ₀ =	mph (Exhibit 13-11)				S ₀ =	67.3 mph (Exhibit 13-12)				
S =	mph (Exhibit 13-13)				S =	62.2 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	EA (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	5	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	Freeway Volume, V _F	5386	L _{down} =	1790 ft	Freeway Free-Flow Speed, S _{FF}	65.0
L _{up} =	Ramp Number of Lanes, N	1	V _D =	Ramp Volume, V _R	1441			Ramp Free-Flow Speed, S _{FR}	45.0
V _u =	Acceleration Lane Length, L _A			Freeway Free-Flow Speed, S _{FF}	65.0				
	Deceleration Lane Length L _D	180		Ramp Free-Flow Speed, S _{FR}	45.0				
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5386	0.92	Level	4	0	0.980	1.00	5971	
Ramp	1441	0.92	Level	2	0	0.990	1.00	1582	
UpStream									
DownStream	709	0.92	Level	6	0	0.971	1.00	794	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 3105 pc/h V ₃ or V _{av34} 985 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	5076	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	3494	Exhibit 13-8	9400	No
					V _R	1582	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	3105	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 29.3 (pc/mi/ln) LOS = D (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S =	(Exhibit 13-11)				D _S =	0.440 (Exhibit 13-12)			
S _R =	mph (Exhibit 13-11)				S _R =	54.9 mph (Exhibit 13-12)			
S ₀ =	mph (Exhibit 13-11)				S ₀ =	71.3 mph (Exhibit 13-12)			
S =	mph (Exhibit 13-13)				S =	60.3 mph (Exhibit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information				Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Upstream)						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	EA (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N		4		Downstream Adj Ramp				
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N		1		<input type="checkbox"/> Yes <input type="checkbox"/> On				
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A		200		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off				
L _{up} = 1070 ft	Deceleration Lane Length L _D				L _{down} = ft				
V _u = 709 veh/h	Freeway Volume, V _F		6095		V _D = veh/h				
	Ramp Volume, V _R		210						
	Freeway Free-Flow Speed, S _{FF}		65.0						
	Ramp Free-Flow Speed, S _{FR}		45.0						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6095	0.92	Level	4	0	0.980	1.00	6757	
Ramp	210	0.92	Level	16	0	0.926	1.00	247	
UpStream	709	0.92	Level	6	0	0.971	1.00	794	
DownStream									
Merge Areas				Diverge Areas					
Estimation of v ₁₂				Estimation of v ₁₂					
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.187 using Equation (Exhibit 13-6) V ₁₂ = 1263 pc/h V ₃ or V _{av34} = 2747 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2702 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks				Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	7004	Exhibit 13-8		No	V _F		Exhibit 13-8		
					V _{FO} = V _F - V _R		Exhibit 13-8		
					V _R		Exhibit 13-10		
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	2949	Exhibit 13-8	4600:All	No	V ₁₂		Exhibit 13-8		
Level of Service Determination (if not F)				Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 27.1 (pc/mi/ln) LOS = C (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					
Speed Determination				Speed Determination					
M _S = 0.377 (Exhibit 13-11)				D _s = (Exhibit 13-12)					
S _R = 56.3 mph (Exhibit 13-11)				S _R = mph (Exhibit 13-12)					
S ₀ = 59.5 mph (Exhibit 13-11)				S ₀ = mph (Exhibit 13-12)					
S = 58.1 mph (Exhibit 13-13)				S = mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET								
General Information				Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound					
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Downstream)					
Date Performed	3/20/2017	Jurisdiction	Caltrans					
Analysis Time Period	AM Peak Hour	Analysis Year	EA (2018)					
Project Description Gateway South Building 4 TIA (JN 10187)								
Inputs								
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N Ramp Number of Lanes, N Acceleration Lane Length, L _A Deceleration Lane Length L _D Freeway Volume, V _F Ramp Volume, V _R Freeway Free-Flow Speed, S _{FF} Ramp Free-Flow Speed, S _{FR}	5 1 200 6690 210 65.0 45.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	L _{down} = 1115 ft V _D = 93 veh/h				
L _{up} = ft V _u = veh/h								
Conversion to pc/h Under Base Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	6690	0.92	Level	4	0	0.980	1.00	7417
Ramp	210	0.92	Level	16	0	0.926	1.00	247
UpStream								
DownStream	93	0.92	Level	6	0	0.971	1.00	104
Merge Areas				Diverge Areas				
Estimation of v ₁₂				Estimation of v ₁₂				
L _{EQ} = P _{FM} = V ₁₂ = V ₃ or V _{av34} Is V ₃ or V _{av34} > 2,700 pc/h? Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 If Yes, V _{12a} =	$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) 0.187 using Equation (Exhibit 13-6) 1012 pc/h 2201 pc/h (Equation 13-14 or 13-17) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No 2166 pc/h (Equation 13-16, 13-18, or 13-19)			$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) using Equation (Exhibit 13-7) pc/h pc/h (Equation 13-14 or 13-17) <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks				Capacity Checks				
V _{FO}	Actual	Capacity	LOS F?	V _F	Actual	Capacity	LOS F?	
	5662	Exhibit 13-8	No	V _{FO} = V _F - V _R		Exhibit 13-8		
				V _R		Exhibit 13-10		
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
V _{R12}	Actual	Max Desirable	Violation?	V ₁₂	Actual	Max Desirable	Violation?	
	2413	Exhibit 13-8	4600:All	No		Exhibit 13-8		
Level of Service Determination (if not F)				Level of Service Determination (if not F)				
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A D _R = 22.9 (pc/mi/ln) LOS = C (Exhibit 13-2)				D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination				Speed Determination				
M _S = 0.347 (Exhibit 13-11) S _R = 57.0 mph (Exhibit 13-11) S ₀ = 61.0 mph (Exhibit 13-11) S = 59.2 mph (Exhibit 13-13)				D _S = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA		Freeway/Dir of Travel	I-10 Eastbound					
Agency or Company	Urban Crossroads, Inc.		Junction	Off-Ramp at Waterman					
Date Performed	3/20/2017		Jurisdiction	Caltrans					
Analysis Time Period	AM Peak Hour		Analysis Year	EA (2018)					
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N		4		Downstream Adj Ramp				
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N		1		<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On				
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A				<input type="checkbox"/> No <input type="checkbox"/> Off				
L _{up} = ft	Deceleration Lane Length L _D		1500		L _{down} = 2950 ft				
V _u = veh/h	Freeway Volume, V _F		6310		V _D = 403 veh/h				
	Ramp Volume, V _R		1131						
	Freeway Free-Flow Speed, S _{FF}		65.0						
	Ramp Free-Flow Speed, S _{FR}		45.0						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6310	0.92	Level	11	0	0.948	1.00	7236	
Ramp	1131	0.92	Level	2	0	0.990	1.00	1242	
UpStream									
DownStream	403	0.92	Level	6	0	0.971	1.00	451	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 3855 pc/h V ₃ or V _{av34} 1690 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	7236	Exhibit 13-8		9400 No
					V _{FO} = V _F - V _R	5994	Exhibit 13-8		9400 No
					V _R	1242	Exhibit 13-10		2100 No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	3855	Exhibit 13-8		4400:All No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 23.9 (pc/mi/ln) LOS = C (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11)					D _S = 0.410 (Exhibit 13-12)				
S _R = mph (Exhibit 13-11)					S _R = 55.6 mph (Exhibit 13-12)				
S ₀ = mph (Exhibit 13-11)					S ₀ = 68.6 mph (Exhibit 13-12)				
S = mph (Exhibit 13-13)					S = 61.0 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information				Site Information					
Analyst	BA	Freeway/Dir of Travel	I-10 Eastbound						
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	EA (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N		4		Downstream Adj Ramp				
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N		1		<input type="checkbox"/> Yes <input type="checkbox"/> On				
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A		1500		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off				
L _{up} = 2950 ft	Deceleration Lane Length L _D				L _{down} = ft				
V _u = 1131 veh/h	Freeway Volume, V _F		6310		V _D = veh/h				
	Ramp Volume, V _R		403						
	Freeway Free-Flow Speed, S _{FF}		65.0						
	Ramp Free-Flow Speed, S _{FR}		45.0						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6310	0.92	Level	11	0	0.948	1.00	7236	
Ramp	403	0.92	Level	6	0	0.971	1.00	451	
UpStream	1131	0.92	Level	2	0	0.990	1.00	1242	
DownStream									
Merge Areas				Diverge Areas					
Estimation of v ₁₂				Estimation of v ₁₂					
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.161 using Equation (Exhibit 13-6) V ₁₂ = 1168 pc/h V ₃ or V _{av34} = 3034 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2894 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks				Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	7687	Exhibit 13-8		No	V _F	Exhibit 13-8			
					V _{FO} = V _F - V _R	Exhibit 13-8			
					V _R	Exhibit 13-10			
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	3345	Exhibit 13-8		No	V ₁₂	Exhibit 13-8			
Level of Service Determination (if not F)				Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 22.0 (pc/mi/ln) LOS = C (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					
Speed Determination				Speed Determination					
M _S = 0.297 (Exhibit 13-11) S _R = 58.2 mph (Exhibit 13-11) S ₀ = 59.0 mph (Exhibit 13-11) S = 58.6 mph (Exhibit 13-13)				D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET								
General Information				Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Westbound					
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman					
Date Performed	3/20/2017	Jurisdiction	Caltrans					
Analysis Time Period	AM Peak Hour	Analysis Year	EA (2018)					
Project Description Gateway South Building 4 TIA (JN 10187)								
Inputs								
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp					
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On					
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	1500	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off					
L _{up} = 1815 ft	Deceleration Lane Length L _D		L _{down} = ft					
V _u = 918 veh/h	Freeway Volume, V _F	7787	V _D = veh/h					
	Ramp Volume, V _R	255						
	Freeway Free-Flow Speed, S _{FF}	65.0						
	Ramp Free-Flow Speed, S _{FR}	45.0						
Conversion to pc/h Under Base Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	7787	0.92	Level	15	0	0.930	1.00	9099
Ramp	255	0.92	Level	9	0	0.957	1.00	290
UpStream	918	0.92	Level	2	0	0.990	1.00	1008
DownStream								
Merge Areas				Diverge Areas				
Estimation of v ₁₂				Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.182 using Equation (Exhibit 13-6) V ₁₂ = 1652 pc/h V ₃ or V _{av34} = 3723 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 3699 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}	9389	Exhibit 13-8	No	V _F		Exhibit 13-8		
				V _{FO} = V _F - V _R		Exhibit 13-8		
				V _R		Exhibit 13-10		
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}	3989	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)				Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 27.1 (pc/mi/ln) LOS = C (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination				Speed Determination				
M _S = 0.397 (Exhibit 13-11)				D _s = (Exhibit 13-12)				
S _R = 55.9 mph (Exhibit 13-11)				S _R = mph (Exhibit 13-12)				
S ₀ = 56.1 mph (Exhibit 13-11)				S ₀ = mph (Exhibit 13-12)				
S = 56.0 mph (Exhibit 13-13)				S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst	BA	Freeway/Dir of Travel	I-10 Westbound							
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Waterman							
Date Performed	3/20/2017	Jurisdiction	Caltrans							
Analysis Time Period	AM Peak Hour	Analysis Year	EA (2018)							
Project Description Gateway South Building 4 TIA (JN 10187)										
Inputs										
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N Ramp Number of Lanes, N Acceleration Lane Length, L _A Deceleration Lane Length L _D Freeway Volume, V _F Ramp Volume, V _R Freeway Free-Flow Speed, S _{FF} Ramp Free-Flow Speed, S _{FR}	4 1 1500 7787 918 65.0 45.0					Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 1815 ft V _D = 255 veh/h			
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	7787	0.92	Level	15	0	0.930	1.00	9099		
Ramp	918	0.92	Level	2	0	0.990	1.00	1008		
UpStream										
DownStream	255	0.92	Level	9	0	0.957	1.00	290		
Merge Areas					Diverge Areas					
Estimation of v ₁₂					Estimation of v ₁₂					
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 4536 pc/h V ₃ or V _{av34} 2281 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 13-8			V _F	9099	Exhibit 13-8	9400	No	
					V _{FO} = V _F - V _R	8091	Exhibit 13-8	9400	No	
					V _R	1008	Exhibit 13-10	2100	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?		
V _{R12}		Exhibit 13-8			V ₁₂	4536	Exhibit 13-8	4400:All	Yes	
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 29.8 (pc/mi/ln) LOS = D (Exhibit 13-2)					
Speed Determination					Speed Determination					
M _S = (Exhibit 13-11)					D _S = 0.389 (Exhibit 13-12)					
S _R = mph (Exhibit 13-11)					S _R = 56.1 mph (Exhibit 13-12)					
S ₀ = mph (Exhibit 13-11)					S ₀ = 66.3 mph (Exhibit 13-12)					
S = mph (Exhibit 13-13)					S = 60.8 mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information				Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound	Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Auto Center	Date Performed	3/20/2017
Date Performed	3/20/2017	Jurisdiction	Caltrans	Analysis Time Period	PM Peak Hour	Analysis Year	EA (2018)	Project Description	Gateway South Building 4 TIA (JN 10187)
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp	Freeway Volume, V _F	5856	Downstream Adj Ramp	Downstream Adj Ramp	Freeway Free-Flow Speed, S _{FF}	65.0
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Volume, V _R	863	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	L _{down} =	Ramp Free-Flow Speed, S _{FR}	45.0
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	240	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Free-Flow Speed, S _{FF}	65.0		ft		
L _{up} = 1840 ft	Deceleration Lane Length L _D			Ramp Free-Flow Speed, S _{FR}	45.0				
V _u = 925 veh/h	Freeway Volume, V _F	5856					V _D =		veh/h
	Ramp Volume, V _R	863							
	Freeway Free-Flow Speed, S _{FF}	65.0							
	Ramp Free-Flow Speed, S _{FR}	45.0							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5856	0.92	Level	1	0	0.995	1.00	6397	
Ramp	863	0.92	Level	2	0	0.990	1.00	947	
UpStream	925	0.92	Level	2	0	0.990	1.00	1015	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.099 using Equation (Exhibit 13-6) V ₁₂ = 636 pc/h V ₃ or V _{av34} = 2880 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2558 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = V ₃ or V _{av34} = Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?		
V _{FO}	7344	Exhibit 13-8	No		V _F	Exhibit 13-8			
					V _{FO} = V _F - V _R	Exhibit 13-8			
					V _R	Exhibit 13-10			
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?		
V _{R12}	3505	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8			
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 30.9 (pc/mi/ln) LOS = D (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S =	0.429 (Exhibit 13-11)				D _s =	(Exhibit 13-12)			
S _R =	55.1 mph (Exhibit 13-11)				S _R =	mph (Exhibit 13-12)			
S ₀ =	59.9 mph (Exhibit 13-11)				S ₀ =	mph (Exhibit 13-12)			
S =	57.5 mph (Exhibit 13-13)				S =	mph (Exhibit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	EA (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	4	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Ramp Number of Lanes, N	2	$L_{down} =$	1260 ft	$V_D =$	925 veh/h
$L_{up} =$	ft	Acceleration Lane Length, L_A		Deceleration Lane Length L_D	975	Freeway Volume, V_F	6780	Ramp Volume, V_R	981
$V_u =$	veh/h	Freeway Free-Flow Speed, S_{FF}		Ramp Free-Flow Speed, S_{FR}	45.0	Freeway Free-Flow Speed, S_{FF}	65.0	Ramp Free-Flow Speed, S_{FR}	45.0
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	6780	0.92	Level	1	0	0.995	1.00	7406	
Ramp	981	0.92	Level	5	0	0.976	1.00	1093	
UpStream									
DownStream	925	0.92	Level	2	0	0.990	1.00	1015	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$L_{EQ} =$	$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)	$P_{FM} =$	using Equation (Exhibit 13-6)		$L_{EQ} =$	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)	$P_{FD} =$	0.260 using Equation (Exhibit 13-7)	
$V_{12} =$	pc/h	V_3 or V_{av34}	pc/h (Equation 13-14 or 13-17)		$V_{12} =$	2734 pc/h	V_3 or V_{av34}	2336 pc/h (Equation 13-14 or 13-17)	
Is V_3 or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input type="checkbox"/> No		Is V_3 or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, $V_{12a} =$	2962 pc/h (Equation 13-16, 13-18, or 13-19)						
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8			V_F	7406	Exhibit 13-8	9400	No
					$V_{FO} = V_F - V_R$	6313	Exhibit 13-8	9400	No
					V_R	1093	Exhibit 13-10	4200	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8			V_{12}	2734	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$				
$D_R =$	(pc/mi/ln)				$D_R =$	10.6 (pc/mi/ln)			
LOS =	(Exhibit 13-2)				LOS =	B (Exhibit 13-2)			
Speed Determination					Speed Determination				
$M_S =$	(Exhibit 13-11)				$D_S =$	0.396 (Exhibit 13-12)			
$S_R =$	mph (Exhibit 13-11)				$S_R =$	55.9 mph (Exhibit 13-12)			
$S_0 =$	mph (Exhibit 13-11)				$S_0 =$	66.5 mph (Exhibit 13-12)			
$S =$	mph (Exhibit 13-13)				$S =$	61.8 mph (Exhibit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	EA (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	5	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	Freeway Volume, V _F	4751	L _{down} =	1790 ft	Freeway Free-Flow Speed, S _{FF}	65.0
L _{up} =	Ramp Number of Lanes, N	1	V _D =	Ramp Volume, V _R	884				
V _u =	Acceleration Lane Length, L _A								
	Deceleration Lane Length L _D	180							
	Ramp Free-Flow Speed, S _{FR}	45.0							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	4751	0.92	Level	1	0	0.995	1.00	5190	
Ramp	884	0.92	Level	6	0	0.971	1.00	990	
UpStream									
DownStream	1079	0.92	Level	3	0	0.985	1.00	1190	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 2595 pc/h V ₃ or V _{av34} 1038 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	4671	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	3681	Exhibit 13-8	9400	No
					V _R	990	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	2595	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 24.9 (pc/mi/ln) LOS = C (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S =	(Exhibit 13-11)				D _S =	0.387 (Exhibit 13-12)			
S _R =	mph (Exhibit 13-11)				S _R =	56.1 mph (Exhibit 13-12)			
S ₀ =	mph (Exhibit 13-11)				S ₀ =	71.2 mph (Exhibit 13-12)			
S =	mph (Exhibit 13-13)				S =	61.9 mph (Exhibit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Upstream)						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	EA (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N		4		Downstream Adj Ramp				
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N		1		<input type="checkbox"/> Yes <input type="checkbox"/> On				
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A		200		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off				
L _{up} = 1070 ft	Deceleration Lane Length L _D				L _{down} = ft				
V _u = 1079 veh/h	Freeway Volume, V _F		5831		V _D = veh/h				
	Ramp Volume, V _R		598						
	Freeway Free-Flow Speed, S _{FF}		65.0						
	Ramp Free-Flow Speed, S _{FR}		45.0						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5831	0.92	Level	2	0	0.990	1.00	6401	
Ramp	598	0.92	Level	4	0	0.980	1.00	663	
UpStream	1079	0.92	Level	3	0	0.985	1.00	1190	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.135 using Equation (Exhibit 13-6) V ₁₂ = 864 pc/h V ₃ or V _{av34} = 2768 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2560 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	7064	Exhibit 13-8		No	V _F		Exhibit 13-8		
					V _{FO} = V _F - V _R		Exhibit 13-8		
					V _R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	3223	Exhibit 13-8	4600:All	No	V ₁₂		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 29.1 (pc/mi/ln) LOS = D (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = 0.401 (Exhibit 13-11)					D _s = (Exhibit 13-12)				
S _R = 55.8 mph (Exhibit 13-11)					S _R = mph (Exhibit 13-12)				
S ₀ = 59.9 mph (Exhibit 13-11)					S ₀ = mph (Exhibit 13-12)				
S = 57.9 mph (Exhibit 13-13)					S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information				Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Downstream)						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	EA (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N	5				Downstream Adj Ramp			
	Ramp Number of Lanes, N	1				<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On			
	Acceleration Lane Length, L _A	200				<input type="checkbox"/> No <input type="checkbox"/> Off			
	Deceleration Lane Length L _D					L _{down} = 1115 ft			
	Freeway Volume, V _F	8142				V _D = 270 veh/h			
	Ramp Volume, V _R	598							
	Freeway Free-Flow Speed, S _{FF}	65.0							
Ramp Free-Flow Speed, S _{FR}	45.0								
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	8142	0.92	Level	2	0	0.990	1.00	8938	
Ramp	598	0.92	Level	4	0	0.980	1.00	663	
UpStream									
DownStream	270	0.92	Level	5	0	0.976	1.00	301	
Merge Areas				Diverge Areas					
Estimation of v ₁₂				Estimation of v ₁₂					
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.135 using Equation (Exhibit 13-6) V ₁₂ = 869 pc/h V ₃ or V _{av34} = 2784 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2575 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks				Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	7101	Exhibit 13-8		No	V _F		Exhibit 13-8		
					V _{FO} = V _F - V _R		Exhibit 13-8		
					V _R		Exhibit 13-10		
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	3238	Exhibit 13-8	4600:All	No	V ₁₂		Exhibit 13-8		
Level of Service Determination (if not F)				Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 29.2 (pc/mi/ln) LOS = D (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					
Speed Determination				Speed Determination					
M _S = 0.402 (Exhibit 13-11) S _R = 55.7 mph (Exhibit 13-11) S ₀ = 59.8 mph (Exhibit 13-11) S = 57.9 mph (Exhibit 13-13)				D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst	BA	Freeway/Dir of Travel	I-10 Eastbound							
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Waterman							
Date Performed	3/20/2017	Jurisdiction	Caltrans							
Analysis Time Period	PM Peak Hour	Analysis Year	EA (2018)							
Project Description Gateway South Building 4 TIA (JN 10187)										
Inputs										
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N Ramp Number of Lanes, N Acceleration Lane Length, L _A Deceleration Lane Length L _D Freeway Volume, V _F Ramp Volume, V _R Freeway Free-Flow Speed, S _{FF} Ramp Free-Flow Speed, S _{FR}	4 1 1500 5875 665 65.0 45.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	L _{down} = 2950 ft V _D = 847 veh/h	L _{up} = ft V _u = veh/h					
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	5875	0.92	Level	8	0	0.962	1.00	6641		
Ramp	665	0.92	Level	3	0	0.985	1.00	734		
UpStream										
DownStream	847	0.92	Level	3	0	0.985	1.00	934		
Merge Areas					Diverge Areas					
Estimation of v ₁₂					Estimation of v ₁₂					
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 3309 pc/h V ₃ or V _{av34} 1666 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 13-8			V _F	6641	Exhibit 13-8	9400	No	
			V _{FO} = V _F - V _R		5907	Exhibit 13-8	9400	No		
			V _R		734	Exhibit 13-10	2100	No		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?		
V _{R12}		Exhibit 13-8			V ₁₂	3309	Exhibit 13-8	4400:All	No	
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 19.2 (pc/mi/ln) LOS = B (Exhibit 13-2)					
Speed Determination					Speed Determination					
M _S = (Exhibit 13-11)					D _S = 0.364 (Exhibit 13-12)					
S _R = mph (Exhibit 13-11)					S _R = 56.6 mph (Exhibit 13-12)					
S ₀ = mph (Exhibit 13-11)					S ₀ = 68.7 mph (Exhibit 13-12)					
S = mph (Exhibit 13-13)					S = 62.1 mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information				Site Information					
Analyst	BA	Freeway/Dir of Travel	I-10 Eastbound	Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman	Date Performed	3/20/2017
Date Performed	3/20/2017	Jurisdiction	Caltrans	Analysis Time Period	PM Peak Hour	Analysis Year	EA (2018)	Project Description Gateway South Building 4 TIA (JN 10187)	
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp	Freeway Volume, V _F	5875	Downstream Adj Ramp	Freeway Free-Flow Speed, S _{FF}	65.0	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Volume, V _R	847	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Ramp Free-Flow Speed, S _{FR}	45.0	
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	1500	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	L _{up} =	2950 ft	L _{down} =			
	Deceleration Lane Length L _D			V _u =	665 veh/h	V _D =			
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5875	0.92	Level	8	0	0.962	1.00	6641	
Ramp	847	0.92	Level	3	0	0.985	1.00	934	
UpStream	665	0.92	Level	3	0	0.985	1.00	734	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.101 using Equation (Exhibit 13-6) V ₁₂ = 671 pc/h V ₃ or V _{av34} = 2985 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2656 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = V ₃ or V _{av34} = Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?		
V _{FO}	7575	Exhibit 13-8	No		V _F	Exhibit 13-8			
					V _{FO} = V _F - V _R	Exhibit 13-8			
					V _R	Exhibit 13-10			
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?		
V _{R12}	3590	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8			
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 23.6 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S =	0.327 (Exhibit 13-11)				D _s =	(Exhibit 13-12)			
S _R =	57.5 mph (Exhibit 13-11)				S _R =	mph (Exhibit 13-12)			
S ₀ =	59.6 mph (Exhibit 13-11)				S ₀ =	mph (Exhibit 13-12)			
S =	58.6 mph (Exhibit 13-13)				S =	mph (Exhibit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET								
General Information				Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Westbound					
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman					
Date Performed	3/20/2017	Jurisdiction	Caltrans					
Analysis Time Period	PM Peak Hour	Analysis Year	EA (2018)					
Project Description Gateway South Building 4 TIA (JN 10187)								
Inputs								
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp					
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On					
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	1500	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off					
L _{up} = 1815 ft	Deceleration Lane Length L _D		L _{down} = ft					
V _u = 472 veh/h	Freeway Volume, V _F	6755	V _D = veh/h					
	Ramp Volume, V _R	1242						
	Freeway Free-Flow Speed, S _{FF}	65.0						
	Ramp Free-Flow Speed, S _{FR}	45.0						
Conversion to pc/h Under Base Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	6755	0.92	Level	20	0	0.909	1.00	8077
Ramp	1242	0.92	Level	1	0	0.995	1.00	1357
UpStream	472	0.92	Level	2	0	0.990	1.00	518
DownStream								
Merge Areas				Diverge Areas				
Estimation of v ₁₂				Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.048 using Equation (Exhibit 13-6) V ₁₂ = 389 pc/h V ₃ or V _{av34} = 3844 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 3230 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}	9434	Exhibit 13-8	Yes	V _F		Exhibit 13-8		
				V _{FO} = V _F - V _R		Exhibit 13-8		
				V _R		Exhibit 13-10		
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}	4587	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)				Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 31.2 (pc/mi/ln) LOS = F (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination				Speed Determination				
M _S = 0.569 (Exhibit 13-11)				D _s = (Exhibit 13-12)				
S _R = 51.9 mph (Exhibit 13-11)				S _R = mph (Exhibit 13-12)				
S ₀ = 57.7 mph (Exhibit 13-11)				S ₀ = mph (Exhibit 13-12)				
S = 54.7 mph (Exhibit 13-13)				S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Westbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Waterman						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	EA (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N 4				Downstream Adj Ramp				
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N 1				<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On				
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A				<input type="checkbox"/> No <input type="checkbox"/> Off				
L _{up} = ft	Deceleration Lane Length L _D 1500				L _{down} = 1815 ft				
V _u = veh/h	Freeway Volume, V _F 6755				V _D = 1242 veh/h				
	Ramp Volume, V _R 472								
	Freeway Free-Flow Speed, S _{FF} 65.0								
	Ramp Free-Flow Speed, S _{FR} 45.0								
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6755	0.92	Level	20	0	0.909	1.00	8077	
Ramp	472	0.92	Level	2	0	0.990	1.00	518	
UpStream									
DownStream	1242	0.92	Level	1	0	0.995	1.00	1357	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 3814 pc/h V ₃ or V _{av34} 2131 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	8077	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	7559	Exhibit 13-8	9400	No
					V _R	518	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	3814	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 23.6 (pc/mi/ln) LOS = C (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11)					D _S = 0.345 (Exhibit 13-12)				
S _R = mph (Exhibit 13-11)					S _R = 57.1 mph (Exhibit 13-12)				
S ₀ = mph (Exhibit 13-11)					S ₀ = 66.9 mph (Exhibit 13-12)				
S = mph (Exhibit 13-13)					S = 61.9 mph (Exhibit 13-13)				

APPENDIX 6.10:

EAP (2018) CONDITIONS RAMP JUNCTION ANALYSIS WORKSHEETS

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RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound						
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Auto Center						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	EAP (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp						
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On						
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	240	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off						
L _{up} = 1840 ft	Deceleration Lane Length L _D		L _{down} = ft						
V _u = 974 veh/h	Freeway Volume, V _F	5214	V _D = veh/h						
	Ramp Volume, V _R	282							
	Freeway Free-Flow Speed, S _{FF}	65.0							
	Ramp Free-Flow Speed, S _{FR}	45.0							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5214	0.92	Level	2	0	0.990	1.00	5724	
Ramp	282	0.92	Level	19	0	0.913	1.00	336	
UpStream	974	0.92	Level	2	0	0.990	1.00	1069	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.176 using Equation (Exhibit 13-6) V ₁₂ = 1006 pc/h V ₃ or V _{av34} = 2359 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2289 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity	LOS F?			Actual	Capacity	LOS F?	
V _{FO}	6060	Exhibit 13-8	No		V _F	Exhibit 13-8			
					V _{FO} = V _F - V _R	Exhibit 13-8			
					V _R	Exhibit 13-10			
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}	2625	Exhibit 13-8	4600:All		No	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 24.3 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = 0.353 (Exhibit 13-11)					D _s = (Exhibit 13-12)				
S _R = 56.9 mph (Exhibit 13-11)					S _R = mph (Exhibit 13-12)				
S ₀ = 60.6 mph (Exhibit 13-11)					S ₀ = mph (Exhibit 13-12)				
S = 58.9 mph (Exhibit 13-13)					S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	EAP (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N 4				Downstream Adj Ramp				
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N 2				<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On				
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A				<input type="checkbox"/> No <input checked="" type="checkbox"/> Off				
L _{up} = ft	Deceleration Lane Length L _D 975				L _{down} = 1260 ft				
V _u = veh/h	Freeway Volume, V _F 6188				V _D = 974 veh/h				
	Ramp Volume, V _R 982								
	Freeway Free-Flow Speed, S _{FF} 65.0								
	Ramp Free-Flow Speed, S _{FR} 45.0								
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6188	0.92	Level	2	0	0.990	1.00	6793	
Ramp	982	0.92	Level	6	0	0.971	1.00	1099	
UpStream									
DownStream	974	0.92	Level	2	0	0.990	1.00	1069	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 2579 pc/h V ₃ or V _{av34} 2107 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2717 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	6793	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	5694	Exhibit 13-8	9400	No
					V _R	1099	Exhibit 13-10	4200	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	2579	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 8.5 (pc/mi/ln) LOS = A (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S =	(Exhibit 13-11)				D _S =	0.397 (Exhibit 13-12)			
S _R =	mph (Exhibit 13-11)				S _R =	55.9 mph (Exhibit 13-12)			
S ₀ =	mph (Exhibit 13-11)				S ₀ =	67.3 mph (Exhibit 13-12)			
S =	mph (Exhibit 13-13)				S =	62.2 mph (Exhibit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	EAP (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N	5	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 1790 ft V _D = 709 veh/h	Ramp Number of Lanes, N	1	Acceleration Lane Length, L _A		Deceleration Lane Length L _D	180
	Freeway Volume, V _F	5386		Ramp Volume, V _R	1465	Freeway Free-Flow Speed, S _{FF}	65.0	Ramp Free-Flow Speed, S _{FR}	45.0
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5386	0.92	Level	4	0	0.980	1.00	5971	
Ramp	1465	0.92	Level	2	0	0.990	1.00	1608	
UpStream									
DownStream	709	0.92	Level	6	0	0.971	1.00	794	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 3120 pc/h V ₃ or V _{av34} 978 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	5076	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	3468	Exhibit 13-8	9400	No
					V _R	1608	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	3120	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 29.5 (pc/mi/ln) LOS = D (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11)					D _S = 0.443 (Exhibit 13-12)				
S _R = mph (Exhibit 13-11)					S _R = 54.8 mph (Exhibit 13-12)				
S ₀ = mph (Exhibit 13-11)					S ₀ = 71.3 mph (Exhibit 13-12)				
S = mph (Exhibit 13-13)					S = 60.2 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information				Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Upstream)						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	EAP (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N		4		Downstream Adj Ramp				
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N		1		<input type="checkbox"/> Yes <input type="checkbox"/> On				
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A		200		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off				
L _{up} = 1070 ft	Deceleration Lane Length L _D				L _{down} = ft				
V _u = 709 veh/h	Freeway Volume, V _F		6095		V _D = veh/h				
	Ramp Volume, V _R		222						
	Freeway Free-Flow Speed, S _{FF}		65.0						
	Ramp Free-Flow Speed, S _{FR}		45.0						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6095	0.92	Level	4	0	0.980	1.00	6757	
Ramp	222	0.92	Level	17	0	0.922	1.00	262	
UpStream	709	0.92	Level	6	0	0.971	1.00	794	
DownStream									
Merge Areas				Diverge Areas					
Estimation of v ₁₂				Estimation of v ₁₂					
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.185 using Equation (Exhibit 13-6) V ₁₂ = 1250 pc/h V ₃ or V _{av34} = 2753 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2702 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks				Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	7019	Exhibit 13-8		No		V _F	Exhibit 13-8		
						V _{FO} = V _F - V _R	Exhibit 13-8		
						V _R	Exhibit 13-10		
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	2964	Exhibit 13-8		No		V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)				Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 27.2 (pc/mi/ln) LOS = C (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					
Speed Determination				Speed Determination					
M _S = 0.379 (Exhibit 13-11) S _R = 56.3 mph (Exhibit 13-11) S ₀ = 59.5 mph (Exhibit 13-11) S = 58.1 mph (Exhibit 13-13)				D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information				Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Downstream)						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	EAP (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N Ramp Number of Lanes, N Acceleration Lane Length, L _A Deceleration Lane Length L _D	5 1 200	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	L _{up} = ft V _u = veh/h	Freeway Volume, V _F Ramp Volume, V _R Freeway Free-Flow Speed, S _{FF} Ramp Free-Flow Speed, S _{FR}	6702 222 65.0 45.0	L _{down} = 1115 ft V _D = 93 veh/h		
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6702	0.92	Level	4	0	0.980	1.00	7430	
Ramp	222	0.92	Level	17	0	0.922	1.00	262	
UpStream									
DownStream	93	0.92	Level	6	0	0.971	1.00	104	
Merge Areas				Diverge Areas					
Estimation of v ₁₂				Estimation of v ₁₂					
L _{EQ} =	V ₁₂ = V _F (P _{FM}) (Equation 13-6 or 13-7)				L _{EQ} =	V ₁₂ = V _R + (V _F - V _R)P _{FD} (Equation 13-12 or 13-13)			
P _{FM} =	0.185 using Equation (Exhibit 13-6)				P _{FD} =	using Equation (Exhibit 13-7)			
V ₁₂ =	1004 pc/h				V ₁₂ =	pc/h			
V ₃ or V _{av34}	2210 pc/h (Equation 13-14 or 13-17)				V ₃ or V _{av34}	pc/h (Equation 13-14 or 13-17)			
Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No			
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input type="checkbox"/> Yes <input type="checkbox"/> No			
If Yes, V _{12a} =	2169 pc/h (Equation 13-16, 13-18, or 13-19)				If Yes, V _{12a} =	pc/h (Equation 13-16, 13-18, or 13-19)			
Capacity Checks				Capacity Checks					
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?		
V _{FO}	5686	Exhibit 13-8	No	V _F		Exhibit 13-8			
				V _{FO} = V _F - V _R		Exhibit 13-8			
				V _R		Exhibit 13-10			
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area					
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?		
V _{R12}	2431	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8			
Level of Service Determination (if not F)				Level of Service Determination (if not F)					
D _R =	5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A			D _R =	4.252 + 0.0086 V ₁₂ - 0.009 L _D				
D _R =	23.1 (pc/mi/ln)			D _R =	(pc/mi/ln)				
LOS =	C (Exhibit 13-2)			LOS =	(Exhibit 13-2)				
Speed Determination				Speed Determination					
M _S =	0.347 (Exhibit 13-11)			D _s =	(Exhibit 13-12)				
S _R =	57.0 mph (Exhibit 13-11)			S _R =	mph (Exhibit 13-12)				
S ₀ =	60.9 mph (Exhibit 13-11)			S ₀ =	mph (Exhibit 13-12)				
S =	59.2 mph (Exhibit 13-13)			S =	mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Eastbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Waterman						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	EAP (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N 4						Downstream Adj Ramp		
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N 1						<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On		
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A						<input type="checkbox"/> No <input type="checkbox"/> Off		
L _{up} = ft	Deceleration Lane Length L _D 1500						L _{down} = 2950 ft		
V _u = veh/h	Freeway Volume, V _F 6310						V _D = 413 veh/h		
	Ramp Volume, V _R 1158								
	Freeway Free-Flow Speed, S _{FF} 65.0								
	Ramp Free-Flow Speed, S _{FR} 45.0								
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6310	0.92	Level	11	0	0.948	1.00	7236	
Ramp	1158	0.92	Level	3	0	0.985	1.00	1278	
UpStream									
DownStream	413	0.92	Level	7	0	0.966	1.00	465	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 3876 pc/h V ₃ or V _{av34} 1680 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	7236	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	5958	Exhibit 13-8	9400	No
					V _R	1278	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	3876	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 24.1 (pc/mi/ln) LOS = C (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S =	(Exhibit 13-11)				D _S =	0.413 (Exhibit 13-12)			
S _R =	mph (Exhibit 13-11)				S _R =	55.5 mph (Exhibit 13-12)			
S ₀ =	mph (Exhibit 13-11)				S ₀ =	68.7 mph (Exhibit 13-12)			
S =	mph (Exhibit 13-13)				S =	60.9 mph (Exhibit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Eastbound						
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	EAP (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N		4		Downstream Adj Ramp				
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N		1		<input type="checkbox"/> Yes <input type="checkbox"/> On				
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A		1500		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off				
L _{up} = 2950 ft	Deceleration Lane Length L _D				L _{down} = ft				
V _u = 1158 veh/h	Freeway Volume, V _F		6310		V _D = veh/h				
	Ramp Volume, V _R		413						
	Freeway Free-Flow Speed, S _{FF}		65.0						
	Ramp Free-Flow Speed, S _{FR}		45.0						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6310	0.92	Level	11	0	0.948	1.00	7236	
Ramp	413	0.92	Level	7	0	0.966	1.00	465	
UpStream	1158	0.92	Level	3	0	0.985	1.00	1278	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.160 using Equation (Exhibit 13-6) V ₁₂ = 1155 pc/h V ₃ or V _{av34} = 3040 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2894 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	7701	Exhibit 13-8		No	V _F		Exhibit 13-8		
					V _{FO} = V _F - V _R		Exhibit 13-8		
					V _R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	3359	Exhibit 13-8	4600:All	No	V ₁₂		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 22.1 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = 0.298 (Exhibit 13-11)					D _s = (Exhibit 13-12)				
S _R = 58.1 mph (Exhibit 13-11)					S _R = mph (Exhibit 13-12)				
S ₀ = 59.0 mph (Exhibit 13-11)					S ₀ = mph (Exhibit 13-12)				
S = 58.6 mph (Exhibit 13-13)					S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET								
General Information				Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Westbound					
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman					
Date Performed	4/3/2017	Jurisdiction	Caltrans					
Analysis Time Period	AM Peak Hour	Analysis Year	EAP (2018)					
Project Description Gateway South Building 4 TIA (JN 10187)								
Inputs								
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp					
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On					
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	1500	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off					
L _{up} = 1815 ft	Deceleration Lane Length L _D		L _{down} = ft					
V _u = 942 veh/h	Freeway Volume, V _F	7787	V _D = veh/h					
	Ramp Volume, V _R	261						
	Freeway Free-Flow Speed, S _{FF}	65.0						
	Ramp Free-Flow Speed, S _{FR}	45.0						
Conversion to pc/h Under Base Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	7787	0.92	Level	15	0	0.930	1.00	9099
Ramp	261	0.92	Level	9	0	0.957	1.00	296
UpStream	942	0.92	Level	3	0	0.985	1.00	1039
DownStream								
Merge Areas				Diverge Areas				
Estimation of v ₁₂				Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.181 using Equation (Exhibit 13-6) V ₁₂ = 1645 pc/h V ₃ or V _{av34} = 3727 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 3699 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}	9395	Exhibit 13-8	No	V _F		Exhibit 13-8		
				V _{FO} = V _F - V _R		Exhibit 13-8		
				V _R		Exhibit 13-10		
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}	3995	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)				Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 27.1 (pc/mi/ln) LOS = C (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination				Speed Determination				
M _S = 0.398 (Exhibit 13-11)				D _s = (Exhibit 13-12)				
S _R = 55.8 mph (Exhibit 13-11)				S _R = mph (Exhibit 13-12)				
S ₀ = 56.1 mph (Exhibit 13-11)				S ₀ = mph (Exhibit 13-12)				
S = 56.0 mph (Exhibit 13-13)				S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst	BA	Freeway/Dir of Travel	I-10 Westbound							
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Waterman							
Date Performed	3/20/2017	Jurisdiction	Caltrans							
Analysis Time Period	AM Peak Hour	Analysis Year	EAP (2018)							
Project Description Gateway South Building 4 TIA (JN 10187)										
Inputs										
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N Ramp Number of Lanes, N Acceleration Lane Length, L _A Deceleration Lane Length L _D Freeway Volume, V _F Ramp Volume, V _R Freeway Free-Flow Speed, S _{FF} Ramp Free-Flow Speed, S _{FR}	4 1 1500 7787 942 65.0 45.0					Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 1815 ft V _D = 255 veh/h			
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	7787	0.92	Level	15	0	0.930	1.00	9099		
Ramp	942	0.92	Level	3	0	0.985	1.00	1039		
UpStream										
DownStream	255	0.92	Level	9	0	0.957	1.00	290		
Merge Areas					Diverge Areas					
Estimation of v₁₂					Estimation of v₁₂					
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 4553 pc/h V ₃ or V _{av34} 2273 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 13-8			V _F	9099	Exhibit 13-8	9400	No	
					V _{FO} = V _F - V _R	8060	Exhibit 13-8	9400	No	
					V _R	1039	Exhibit 13-10	2100	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?		
V _{R12}		Exhibit 13-8			V ₁₂	4553	Exhibit 13-8	4400:All	Yes	
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 29.9 (pc/mi/ln) LOS = D (Exhibit 13-2)					
Speed Determination					Speed Determination					
M _S = (Exhibit 13-11)					D _S = 0.392 (Exhibit 13-12)					
S _R = mph (Exhibit 13-11)					S _R = 56.0 mph (Exhibit 13-12)					
S ₀ = mph (Exhibit 13-11)					S ₀ = 66.3 mph (Exhibit 13-12)					
S = mph (Exhibit 13-13)					S = 60.7 mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information				Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound	Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Auto Center	Date Performed	3/20/2017
Date Performed	3/20/2017	Jurisdiction	Caltrans	Analysis Time Period	PM Peak Hour	Analysis Year	EAP (2018)	Project Description Gateway South Building 4 TIA (JN 10187)	
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp	Freeway Volume, V _F	5856				
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Volume, V _R	891				
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	240	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Free-Flow Speed, S _{FF}	65.0				
L _{up} = 1840 ft	Deceleration Lane Length L _D		L _{down} = ft	Ramp Free-Flow Speed, S _{FR}	45.0				
V _u = 925 veh/h			V _D = veh/h						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5856	0.92	Level	1	0	0.995	1.00	6397	
Ramp	891	0.92	Level	3	0	0.985	1.00	983	
UpStream	925	0.92	Level	2	0	0.990	1.00	1015	
DownStream									
Merge Areas				Diverge Areas					
Estimation of v₁₂				Estimation of v₁₂					
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.095 using Equation (Exhibit 13-6) V ₁₂ = 607 pc/h V ₃ or V _{av34} = 2895 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2558 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks				Capacity Checks					
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?		
V _{FO}	7380	Exhibit 13-8	No	V _F		Exhibit 13-8			
				V _{FO} = V _F - V _R		Exhibit 13-8			
				V _R		Exhibit 13-10			
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area					
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?		
V _{R12}	3541	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8			
Level of Service Determination (if not F)				Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 31.1 (pc/mi/ln) LOS = D (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					
Speed Determination				Speed Determination					
M _S = 0.434 (Exhibit 13-11)				D _s = (Exhibit 13-12)					
S _R = 55.0 mph (Exhibit 13-11)				S _R = mph (Exhibit 13-12)					
S ₀ = 59.9 mph (Exhibit 13-11)				S ₀ = mph (Exhibit 13-12)					
S = 57.5 mph (Exhibit 13-13)				S = mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound							
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center							
Date Performed	3/20/2017	Jurisdiction	Caltrans							
Analysis Time Period	PM Peak Hour	Analysis Year	EAP (2018)							
Project Description Gateway South Building 4 TIA (JN 10187)										
Inputs										
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	4	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off							
$L_{up} =$ ft	Ramp Number of Lanes, N	2	$L_{down} =$ 1260 ft							
$V_u =$ veh/h	Acceleration Lane Length, L_A		$V_D =$ 925 veh/h							
	Deceleration Lane Length L_D	975								
	Freeway Volume, V_F	6780								
	Ramp Volume, V_R	996								
	Freeway Free-Flow Speed, S_{FF}	65.0								
	Ramp Free-Flow Speed, S_{FR}	45.0								
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$		
Freeway	6780	0.92	Level	1	0	0.995	1.00	7406		
Ramp	996	0.92	Level	5	0	0.976	1.00	1110		
UpStream										
DownStream	925	0.92	Level	2	0	0.990	1.00	1015		
Merge Areas					Diverge Areas					
Estimation of v_{12}					Estimation of v_{12}					
$L_{EQ} =$	$V_{12} = V_F (P_{FM})$	(Equation 13-6 or 13-7)			$L_{EQ} =$	$V_{12} = V_R + (V_F - V_R)P_{FD}$	(Equation 13-12 or 13-13)			
$P_{FM} =$	using Equation (Exhibit 13-6)				$P_{FD} =$	0.260	using Equation (Exhibit 13-7)			
$V_{12} =$	pc/h				$V_{12} =$	2747 pc/h				
V_3 or V_{av34}	pc/h (Equation 13-14 or 13-17)				V_3 or V_{av34}	2329 pc/h (Equation 13-14 or 13-17)				
Is V_3 or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V_3 or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)				If Yes, $V_{12a} =$	2962 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V_{FO}		Exhibit 13-8			V_F	7406	Exhibit 13-8		9400	No
					$V_{FO} = V_F - V_R$	6296	Exhibit 13-8		9400	No
					V_R	1110	Exhibit 13-10		4200	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?	
V_{R12}		Exhibit 13-8			V_{12}	2747	Exhibit 13-8		4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$					
$D_R =$ (pc/mi/ln)					$D_R =$ 10.6 (pc/mi/ln)					
LOS = (Exhibit 13-2)					LOS = B (Exhibit 13-2)					
Speed Determination					Speed Determination					
$M_S =$ (Exhibit 13-11)					$D_S =$ 0.398 (Exhibit 13-12)					
$S_R =$ mph (Exhibit 13-11)					$S_R =$ 55.8 mph (Exhibit 13-12)					
$S_0 =$ mph (Exhibit 13-11)					$S_0 =$ 66.5 mph (Exhibit 13-12)					
$S =$ mph (Exhibit 13-13)					$S =$ 61.8 mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	EAP (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N	5	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 1790 ft V _D = 1079 veh/h	Ramp Number of Lanes, N	1	Acceleration Lane Length, L _A		Deceleration Lane Length L _D	180
	Freeway Volume, V _F	4751		Ramp Volume, V _R	896	Freeway Free-Flow Speed, S _{FF}	65.0	Ramp Free-Flow Speed, S _{FR}	45.0
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	4751	0.92	Level	1	0	0.995	1.00	5190	
Ramp	896	0.92	Level	6	0	0.971	1.00	1003	
UpStream									
DownStream	1079	0.92	Level	3	0	0.985	1.00	1190	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 2602 pc/h V ₃ or V _{av34} 1034 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	4671	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	3668	Exhibit 13-8	9400	No
					V _R	1003	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	2602	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 25.0 (pc/mi/ln) LOS = C (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11)					D _S = 0.388 (Exhibit 13-12)				
S _R = mph (Exhibit 13-11)					S _R = 56.1 mph (Exhibit 13-12)				
S ₀ = mph (Exhibit 13-11)					S ₀ = 71.2 mph (Exhibit 13-12)				
S = mph (Exhibit 13-13)					S = 61.9 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Upstream)						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	EAP (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N = 4				Downstream Adj Ramp				
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N = 1				<input type="checkbox"/> Yes <input type="checkbox"/> On				
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A = 200				<input checked="" type="checkbox"/> No <input type="checkbox"/> Off				
L _{up} = 1070 ft	Deceleration Lane Length L _D				L _{down} = ft				
V _u = 1079 veh/h	Freeway Volume, V _F = 5831				V _D = veh/h				
	Ramp Volume, V _R = 631								
	Freeway Free-Flow Speed, S _{FF} = 65.0								
	Ramp Free-Flow Speed, S _{FR} = 45.0								
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5831	0.92	Level	2	0	0.990	1.00	6401	
Ramp	631	0.92	Level	5	0	0.976	1.00	703	
UpStream	1079	0.92	Level	3	0	0.985	1.00	1190	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.130 using Equation (Exhibit 13-6) V ₁₂ = 832 pc/h V ₃ or V _{av34} = 2784 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2560 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	7104	Exhibit 13-8		No	V _F		Exhibit 13-8		
					V _{FO} = V _F - V _R		Exhibit 13-8		
					V _R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	3263	Exhibit 13-8	4600:All	No	V ₁₂		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 29.3 (pc/mi/ln) LOS = D (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = 0.405 (Exhibit 13-11)					D _s = (Exhibit 13-12)				
S _R = 55.7 mph (Exhibit 13-11)					S _R = mph (Exhibit 13-12)				
S ₀ = 59.9 mph (Exhibit 13-11)					S ₀ = mph (Exhibit 13-12)				
S = 57.9 mph (Exhibit 13-13)					S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information				Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Downstream)						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	EAP (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N Ramp Number of Lanes, N Acceleration Lane Length, L _A Deceleration Lane Length L _D	5 1 200	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	L _{up} = V _u =	ft veh/h	Freeway Volume, V _F Ramp Volume, V _R Freeway Free-Flow Speed, S _{FF} Ramp Free-Flow Speed, S _{FR}	8175 631 65.0 45.0	L _{down} = V _D =	1115 ft 270 veh/h
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	8175	0.92	Level	2	0	0.990	1.00	8975	
Ramp	631	0.92	Level	5	0	0.976	1.00	703	
UpStream									
DownStream	270	0.92	Level	5	0	0.976	1.00	301	
Merge Areas				Diverge Areas					
Estimation of v ₁₂				Estimation of v ₁₂					
L _{EQ} = P _{FM} = V ₁₂ = V ₃ or V _{av34} Is V ₃ or V _{av34} > 2,700 pc/h? Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 If Yes, V _{12a} =	$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) 0.130 using Equation (Exhibit 13-6) 841 pc/h 2817 pc/h (Equation 13-14 or 13-17) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No 2590 pc/h (Equation 13-16, 13-18, or 13-19)			$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) using Equation (Exhibit 13-7) pc/h pc/h (Equation 13-14 or 13-17) <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks				Capacity Checks					
V _{FO}	Actual	Capacity	LOS F?	V _F	Actual	Capacity	LOS F?		
	7178	Exhibit 13-8	No	V _{FO} = V _F - V _R		Exhibit 13-8			
				V _R		Exhibit 13-10			
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area					
V _{R12}	Actual	Max Desirable	Violation?	V ₁₂	Actual	Max Desirable	Violation?		
	3293	Exhibit 13-8	4600:All	No		Exhibit 13-8			
Level of Service Determination (if not F)				Level of Service Determination (if not F)					
D _R = D _R = LOS =	$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ 29.6 (pc/mi/ln) D (Exhibit 13-2)			$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ (pc/mi/ln) (Exhibit 13-2)					
Speed Determination				Speed Determination					
M _S = S _R = S ₀ = S =	0.408 (Exhibit 13-11) 55.6 mph (Exhibit 13-11) 59.8 mph (Exhibit 13-11) 57.8 mph (Exhibit 13-13)			(Exhibit 13-12) mph (Exhibit 13-12) mph (Exhibit 13-12) mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Eastbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Waterman						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	EAP (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N		4		Downstream Adj Ramp				
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N		1		<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On				
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A				<input type="checkbox"/> No <input type="checkbox"/> Off				
L _{up} = ft	Deceleration Lane Length L _D		1500		L _{down} = 2950 ft				
V _u = veh/h	Freeway Volume, V _F		5875		V _D = 876 veh/h				
	Ramp Volume, V _R		680						
	Freeway Free-Flow Speed, S _{FF}		65.0						
	Ramp Free-Flow Speed, S _{FR}		45.0						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5875	0.92	Level	8	0	0.962	1.00	6641	
Ramp	680	0.92	Level	3	0	0.985	1.00	750	
UpStream									
DownStream	876	0.92	Level	4	0	0.980	1.00	971	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 3318 pc/h V ₃ or V _{av34} 1661 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	6641	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	5891	Exhibit 13-8	9400	No
					V _R	750	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	3318	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 19.3 (pc/mi/ln) LOS = B (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11)					D _S = 0.366 (Exhibit 13-12)				
S _R = mph (Exhibit 13-11)					S _R = 56.6 mph (Exhibit 13-12)				
S ₀ = mph (Exhibit 13-11)					S ₀ = 68.7 mph (Exhibit 13-12)				
S = mph (Exhibit 13-13)					S = 62.1 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Eastbound						
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	EAP (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp						
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On						
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	1500	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off						
L _{up} = 2950 ft	Deceleration Lane Length L _D		L _{down} = ft						
V _u = 680 veh/h	Freeway Volume, V _F	5875	V _D = veh/h						
	Ramp Volume, V _R	876							
	Freeway Free-Flow Speed, S _{FF}	65.0							
	Ramp Free-Flow Speed, S _{FR}	45.0							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5875	0.92	Level	8	0	0.962	1.00	6641	
Ramp	876	0.92	Level	4	0	0.980	1.00	971	
UpStream	680	0.92	Level	3	0	0.985	1.00	750	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.096 using Equation (Exhibit 13-6) V ₁₂ = 640 pc/h V ₃ or V _{av34} = 3000 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2656 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity	LOS F?			Actual	Capacity	LOS F?	
V _{FO}	7612	Exhibit 13-8	No		V _F	Exhibit 13-8			
					V _{FO} = V _F - V _R	Exhibit 13-8			
					V _R	Exhibit 13-10			
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}	3627	Exhibit 13-8	4600:All		No	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 23.9 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = 0.333 (Exhibit 13-11)					D _s = (Exhibit 13-12)				
S _R = 57.3 mph (Exhibit 13-11)					S _R = mph (Exhibit 13-12)				
S ₀ = 59.6 mph (Exhibit 13-11)					S ₀ = mph (Exhibit 13-12)				
S = 58.5 mph (Exhibit 13-13)					S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Westbound						
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman						
Date Performed	4/3/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	EAP (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N		4		Downstream Adj Ramp				
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N		1		<input type="checkbox"/> Yes <input type="checkbox"/> On				
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A		1500		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off				
L _{up} = 1815 ft	Deceleration Lane Length L _D				L _{down} = ft				
V _u = 485 veh/h	Freeway Volume, V _F		6755		V _D = veh/h				
	Ramp Volume, V _R		1259						
	Freeway Free-Flow Speed, S _{FF}		65.0						
	Ramp Free-Flow Speed, S _{FR}		45.0						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6755	0.92	Level	20	0	0.909	1.00	8077	
Ramp	1259	0.92	Level	1	0	0.995	1.00	1375	
UpStream	485	0.92	Level	3	0	0.985	1.00	535	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.046 using Equation (Exhibit 13-6) V ₁₂ = 371 pc/h V ₃ or V _{av34} = 3853 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 3230 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity	LOS F?			Actual	Capacity	LOS F?	
V _{FO}	9452	Exhibit 13-8	Yes		V _F	Exhibit 13-8			
					V _{FO} = V _F - V _R	Exhibit 13-8			
					V _R	Exhibit 13-10			
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}	4605	Exhibit 13-8	4600:All Yes		V ₁₂	Exhibit 13-8			
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 31.4 (pc/mi/ln) LOS = F (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = 0.576 (Exhibit 13-11)					D _s = (Exhibit 13-12)				
S _R = 51.8 mph (Exhibit 13-11)					S _R = mph (Exhibit 13-12)				
S ₀ = 57.7 mph (Exhibit 13-11)					S ₀ = mph (Exhibit 13-12)				
S = 54.7 mph (Exhibit 13-13)					S = mph (Exhibit 13-13)				

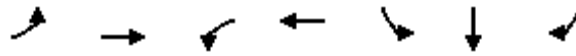
RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Westbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Waterman						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	EAP (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N 4				Downstream Adj Ramp				
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N 1				<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On				
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A				<input type="checkbox"/> No <input type="checkbox"/> Off				
L _{up} = ft	Deceleration Lane Length L _D 1500				L _{down} = 1815 ft				
V _u = veh/h	Freeway Volume, V _F 6755				V _D = 1242 veh/h				
	Ramp Volume, V _R 485								
	Freeway Free-Flow Speed, S _{FF} 65.0								
	Ramp Free-Flow Speed, S _{FR} 45.0								
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6755	0.92	Level	20	0	0.909	1.00	8077	
Ramp	485	0.92	Level	3	0	0.985	1.00	535	
UpStream									
DownStream	1242	0.92	Level	1	0	0.995	1.00	1357	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 3823 pc/h V ₃ or V _{av34} 2127 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	8077	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	7542	Exhibit 13-8	9400	No
					V _R	535	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	3823	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 23.6 (pc/mi/ln) LOS = C (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11)					D _S = 0.346 (Exhibit 13-12)				
S _R = mph (Exhibit 13-11)					S _R = 57.0 mph (Exhibit 13-12)				
S ₀ = mph (Exhibit 13-11)					S ₀ = 66.9 mph (Exhibit 13-12)				
S = mph (Exhibit 13-13)					S = 61.8 mph (Exhibit 13-13)				

APPENDIX 7.1:

EAC (2018) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Timings
1: I-215 SB Ramps & Auto Center Rd.

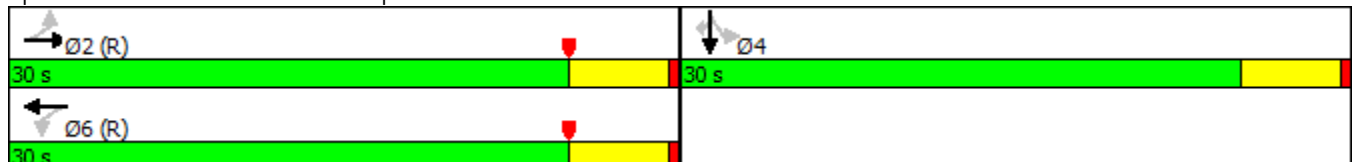


Lane Group	EBL	EBT	WBL	WBT	SBL	SBT	SBR
Lane Configurations		↑↑		↑↑	↘	↙	↗
Traffic Volume (vph)	24	144	1	228	1145	67	359
Future Volume (vph)	24	144	1	228	1145	67	359
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases		2		6		4	
Permitted Phases	2		6		4		4
Detector Phase	2	2	6	6	4	4	4
Switch Phase							
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	30.0	30.0	22.5	22.5	22.5	22.5	22.5
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	5.0	5.0	5.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max	Max
Act Effect Green (s)		25.0		25.0	25.0	25.0	25.0
Actuated g/C Ratio		0.42		0.42	0.42	0.42	0.42
v/c Ratio		0.14		0.16	0.91	0.86	0.39
Control Delay		9.3		11.3	37.5	30.2	2.8
Queue Delay		0.0		0.0	0.0	0.0	0.0
Total Delay		9.3		11.3	37.5	30.2	2.8
LOS		A		B	D	C	A
Approach Delay		9.3		11.3		26.8	
Approach LOS		A		B		C	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 2 (3%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 23.2
 Intersection LOS: C
 Intersection Capacity Utilization 61.3%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 1: I-215 SB Ramps & Auto Center Rd.



HCM Signalized Intersection Capacity Analysis
1: I-215 SB Ramps & Auto Center Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑					↘	↙	↗
Traffic Volume (vph)	24	144	34	1	228	0	0	0	0	1145	67	359
Future Volume (vph)	24	144	34	1	228	0	0	0	0	1145	67	359
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		5.0			5.0					5.0	5.0	5.0
Lane Util. Factor		0.95			0.95					0.95	0.95	1.00
Frt		0.97			1.00					1.00	1.00	0.85
Flt Protected		0.99			1.00					0.95	0.96	1.00
Satd. Flow (prot)		3600			3600					1700	1800	1800
Flt Permitted		0.91			0.95					0.95	0.96	1.00
Satd. Flow (perm)		3600			3600					1700	1800	1800
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	26	153	36	1	243	0	0	0	0	1218	71	382
RTOR Reduction (vph)	0	21	0	0	0	0	0	0	0	0	0	223
Lane Group Flow (vph)	0	194	0	0	244	0	0	0	0	646	643	159
Turn Type	Perm	NA		Perm	NA					Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases	2			6						4		4
Actuated Green, G (s)		25.0			25.0					25.0	25.0	25.0
Effective Green, g (s)		25.0			25.0					25.0	25.0	25.0
Actuated g/C Ratio		0.42			0.42					0.42	0.42	0.42
Clearance Time (s)		5.0			5.0					5.0	5.0	5.0
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1500			1500					708	750	750
v/s Ratio Prot												
v/s Ratio Perm		0.05			0.07					0.38	0.36	0.09
v/c Ratio		0.13			0.16					0.91	0.86	0.21
Uniform Delay, d1		10.8			11.0					16.5	15.9	11.2
Progression Factor		1.00			1.00					1.00	1.00	1.00
Incremental Delay, d2		0.2			0.2					18.1	12.1	0.6
Delay (s)		11.0			11.2					34.6	28.0	11.8
Level of Service		B			B					C	C	B
Approach Delay (s)		11.0			11.2			0.0			26.9	
Approach LOS		B			B			A			C	

Intersection Summary


















HCM 2000 Control Delay	23.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
1: I-215 SB Ramps & Auto Center Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	144	34	1	228	0	0	0	0	1145	67	359
Future Volume (veh/h)	24	144	34	1	228	0	0	0	0	1145	67	359
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1800	1800	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	26	153	29	1	243	0				1269	0	277
Adj No. of Lanes	0	2	0	0	2	0				2	0	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	193	1024	191	61	1397	0				1349	0	637
Arrive On Green	0.42	0.42	0.42	0.42	0.42	0.00				0.42	0.00	0.42
Sat Flow, veh/h	285	2457	457	2	3435	0				3238	0	1530
Grp Volume(v), veh/h	109	0	99	131	113	0				1269	0	277
Grp Sat Flow(s),veh/h/ln	1641	0	1557	1799	1556	0				1619	0	1530
Q Serve(g_s), s	0.0	0.0	2.4	0.0	2.7	0.0				22.6	0.0	7.7
Cycle Q Clear(g_c), s	2.3	0.0	2.4	2.7	2.7	0.0				22.6	0.0	7.7
Prop In Lane	0.24		0.29	0.01		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	758	0	649	810	648	0				1349	0	637
V/C Ratio(X)	0.14	0.00	0.15	0.16	0.17	0.00				0.94	0.00	0.43
Avail Cap(c_a), veh/h	758	0	649	810	648	0				1349	0	637
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	10.9	0.0	10.9	11.0	11.0	0.0				16.8	0.0	12.5
Incr Delay (d2), s/veh	0.4	0.0	0.5	0.4	0.6	0.0				13.9	0.0	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	1.1	1.4	1.3	0.0				12.5	0.0	3.6
LnGrp Delay(d),s/veh	11.3	0.0	11.4	11.4	11.6	0.0				30.7	0.0	14.6
LnGrp LOS	B		B	B	B					C		B
Approach Vol, veh/h		208			244						1546	
Approach Delay, s/veh		11.3			11.5						27.8	
Approach LOS		B			B						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		30.0		30.0		30.0						
Change Period (Y+Rc), s		5.0		5.0		5.0						
Max Green Setting (Gmax), s		25.0		25.0		25.0						
Max Q Clear Time (g_c+I1), s		4.4		24.6		4.7						
Green Ext Time (p_c), s		2.3		0.3		2.3						
Intersection Summary												
HCM 2010 Ctrl Delay			24.1									
HCM 2010 LOS			C									
Notes												

Timings

2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.

3/27/2017

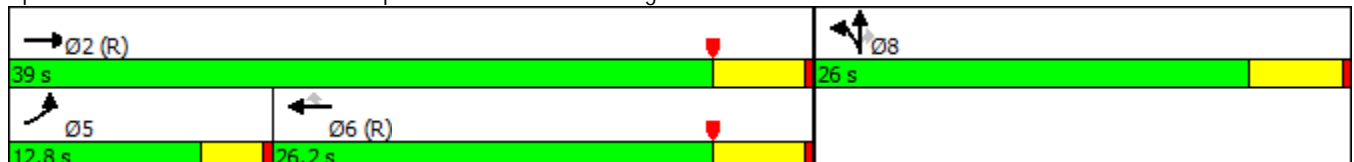


Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations	↶	↷↷	↷↷	↷	↶	↷	↷↷
Traffic Volume (vph)	83	1226	360	291	168	9	1089
Future Volume (vph)	83	1226	360	291	168	9	1089
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm
Protected Phases	5	2	6		8	8	
Permitted Phases				6			8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	8.0	8.0	8.0	5.0	5.0	5.0
Minimum Split (s)	8.5	39.0	13.0	13.0	10.0	10.0	10.0
Total Split (s)	12.8	39.0	26.2	26.2	26.0	26.0	26.0
Total Split (%)	19.7%	60.0%	40.3%	40.3%	40.0%	40.0%	40.0%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max
Act Effect Green (s)	7.6	34.0	24.6	24.6	21.0	21.0	21.0
Actuated g/C Ratio	0.12	0.52	0.38	0.38	0.32	0.32	0.32
v/c Ratio	0.46	0.72	0.29	0.36	0.18	0.17	0.98
Control Delay	34.1	14.5	16.0	3.6	16.9	16.8	43.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.1	14.5	16.0	3.6	16.9	16.8	43.0
LOS	C	B	B	A	B	B	D
Approach Delay		15.8	10.5			39.4	
Approach LOS		B	B			D	

Intersection Summary

Cycle Length: 65
 Actuated Cycle Length: 65
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.98
 Intersection Signal Delay: 24.0
 Intersection LOS: C
 Intersection Capacity Utilization 84.3%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.
























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↗	↗↗			
Traffic Volume (vph)	83	1226	0	0	360	291	168	9	1089	0	0	0
Future Volume (vph)	83	1226	0	0	360	291	168	9	1089	0	0	0
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800	1700	1800	1800	1800	1800	1800
Total Lost time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	0.88			
Frbp, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.96	1.00			
Satd. Flow (prot)	1700	3600			3600	1800	1700	1800	3600			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.96	1.00			
Satd. Flow (perm)	1700	3600			3600	1800	1700	1800	3600			
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	91	1347	0	0	396	320	185	10	1197	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	202	0	0	62	0	0	0
Lane Group Flow (vph)	91	1347	0	0	396	118	98	97	1135	0	0	0
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	6.6	34.0			23.9	23.9	21.0	21.0	21.0			
Effective Green, g (s)	6.6	34.0			23.9	23.9	21.0	21.0	21.0			
Actuated g/C Ratio	0.10	0.52			0.37	0.37	0.32	0.32	0.32			
Clearance Time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Vehicle Extension (s)	2.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	172	1883			1323	661	549	581	1163			
v/s Ratio Prot	0.05	c0.37			0.11		0.06	0.05				
v/s Ratio Perm						0.07			c0.32			
v/c Ratio	0.53	0.72			0.30	0.18	0.18	0.17	0.98			
Uniform Delay, d1	27.7	11.8			14.6	13.9	15.8	15.7	21.7			
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	1.4	2.4			0.6	0.6	0.7	0.6	21.2			
Delay (s)	29.1	14.2			15.2	14.5	16.5	16.4	42.9			
Level of Service	C	B			B	B	B	B	D			
Approach Delay (s)		15.1			14.9			39.2			0.0	
Approach LOS		B			B			D			A	

Intersection Summary			
HCM 2000 Control Delay	24.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	84.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	1226	0	0	360	291	168	9	1089	0	0	0
Future Volume (veh/h)	83	1226	0	0	360	291	168	9	1089	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1700	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	91	1347	0	0	396	238	192	0	1038			
Adj No. of Lanes	1	2	0	0	2	1	2	0	2			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	113	1789	0	0	1366	611	1046	0	989			
Arrive On Green	0.07	0.52	0.00	0.00	0.40	0.40	0.32	0.00	0.32			
Sat Flow, veh/h	1619	3510	0	0	3510	1530	3238	0	3060			
Grp Volume(v), veh/h	91	1347	0	0	396	238	192	0	1038			
Grp Sat Flow(s),veh/h/ln	1619	1710	0	0	1710	1530	1619	0	1530			
Q Serve(g_s), s	3.6	20.1	0.0	0.0	5.1	7.2	2.8	0.0	21.0			
Cycle Q Clear(g_c), s	3.6	20.1	0.0	0.0	5.1	7.2	2.8	0.0	21.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	113	1789	0	0	1366	611	1046	0	989			
V/C Ratio(X)	0.80	0.75	0.00	0.00	0.29	0.39	0.18	0.00	1.05			
Avail Cap(c_a), veh/h	232	1789	0	0	1366	611	1046	0	989			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.75	0.75	1.00	0.00	1.00			
Uniform Delay (d), s/veh	29.8	12.2	0.0	0.0	13.3	13.9	15.8	0.0	22.0			
Incr Delay (d2), s/veh	5.0	3.0	0.0	0.0	0.4	1.4	0.4	0.0	42.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.8	10.1	0.0	0.0	2.5	3.3	1.3	0.0	14.6			
LnGrp Delay(d),s/veh	34.8	15.2	0.0	0.0	13.7	15.3	16.2	0.0	64.6			
LnGrp LOS	C	B			B	B	B		F			
Approach Vol, veh/h		1438			634			1230				
Approach Delay, s/veh		16.4			14.3			57.1				
Approach LOS		B			B			E				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		39.0			8.0	31.0		26.0				
Change Period (Y+Rc), s		5.0			3.5	5.0		5.0				
Max Green Setting (Gmax), s		34.0			9.3	21.2		21.0				
Max Q Clear Time (g_c+I1), s		22.1			5.6	9.2		23.0				
Green Ext Time (p_c), s		8.7			0.0	8.8		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				31.2								
HCM 2010 LOS				C								
Notes												

Timings
3: E St. & Orange Show Rd.

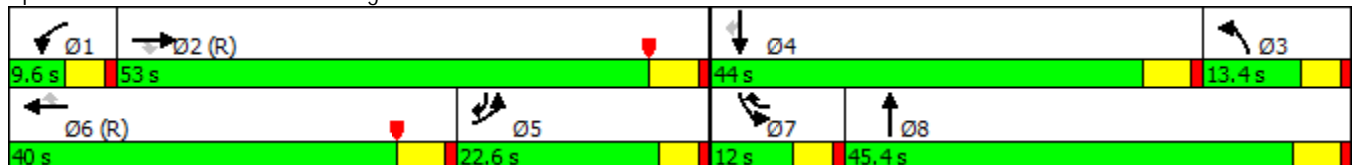


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↖↗	↑↑	↗	↖↗	↑↑	↗	↖	↑↔	↖↗	↑↑	↗
Traffic Volume (vph)	239	1498	495	62	421	68	171	182	52	136	51
Future Volume (vph)	239	1498	495	62	421	68	171	182	52	136	51
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8	7	4	5
Permitted Phases			2			6					4
Detector Phase	5	2	2	1	6	7	3	8	7	4	5
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0
Minimum Split (s)	9.6	39.4	39.4	9.6	39.4	9.6	9.6	38.4	9.6	38.4	9.6
Total Split (s)	22.6	53.0	53.0	9.6	40.0	12.0	13.4	45.4	12.0	44.0	22.6
Total Split (%)	18.8%	44.2%	44.2%	8.0%	33.3%	10.0%	11.2%	37.8%	10.0%	36.7%	18.8%
Yellow Time (s)	3.6	4.4	4.4	3.6	4.4	3.6	3.6	4.4	3.6	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4	4.6	5.4	4.6
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	Max	None	Max	None
Act Effect Green (s)	18.0	49.5	49.5	5.0	34.6	41.8	8.8	42.9	6.4	38.6	62.0
Actuated g/C Ratio	0.15	0.41	0.41	0.04	0.29	0.35	0.07	0.36	0.05	0.32	0.52
v/c Ratio	0.57	1.15	0.60	0.53	0.46	0.11	1.56	0.25	0.35	0.13	0.06
Control Delay	49.7	104.3	13.3	92.2	19.6	0.4	325.9	17.1	60.0	29.3	0.1
Queue Delay	0.0	0.2	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.7	104.5	13.9	92.2	19.6	0.4	325.9	17.1	60.0	29.3	0.1
LOS	D	F	B	F	B	A	F	B	E	C	A
Approach Delay		78.5			25.4			128.0		29.7	
Approach LOS		E			C			F		C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 101.6 (85%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.56
 Intersection Signal Delay: 73.5
 Intersection Capacity Utilization 96.2%
 Analysis Period (min) 15
 Intersection LOS: E
 ICU Level of Service F

























Splits and Phases: 3: E St. & Orange Show Rd.



























HCM Signalized Intersection Capacity Analysis
3: E St. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/28/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	239	1498	495	62	421	68	171	182	122	52	136	51
Future Volume (vph)	239	1498	495	62	421	68	171	182	122	52	136	51
Ideal Flow (vphp)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Total Lost time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95		0.97	0.95	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3200	3600	1800	3200	3600	1800	1700	3600		3200	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3200	3600	1800	3200	3600	1800	1700	3600		3200	3600	1800
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	272	1702	562	70	478	77	194	207	139	59	155	58
RTOR Reduction (vph)	0	0	207	0	0	52	0	89	0	0	0	30
Lane Group Flow (vph)	272	1702	356	70	478	25	194	257	0	59	155	28
Confl. Peds. (#/hr)									2			
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	18.9	47.7	47.7	4.0	32.8	38.2	9.7	42.9		5.4	38.6	57.5
Effective Green, g (s)	18.9	47.7	47.7	4.0	32.8	38.2	9.7	42.9		5.4	38.6	57.5
Actuated g/C Ratio	0.16	0.40	0.40	0.03	0.27	0.32	0.08	0.36		0.05	0.32	0.48
Clearance Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	2.0	2.0	3.0		2.0	3.0	2.0
Lane Grp Cap (vph)	504	1431	715	106	984	573	137	1287		144	1158	931
v/s Ratio Prot	0.09	c0.47		0.02	c0.13	0.00	c0.11	c0.07		c0.02	0.04	0.00
v/s Ratio Perm			0.20			0.01						0.01
v/c Ratio	0.54	1.19	0.50	0.66	0.49	0.04	1.42	0.20		0.41	0.13	0.03
Uniform Delay, d1	46.5	36.1	27.1	57.3	36.5	28.3	55.1	26.7		55.7	28.9	16.5
Progression Factor	0.96	0.94	1.07	1.39	0.52	0.14	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	90.9	1.9	10.9	1.6	0.0	224.5	0.3		0.7	0.2	0.0
Delay (s)	45.3	124.8	31.0	90.3	20.5	3.8	279.7	27.0		56.4	29.1	16.5
Level of Service	D	F	C	F	C	A	F	C		E	C	B
Approach Delay (s)		95.5			26.2			117.8			32.3	
Approach LOS		F			C			F			C	
Intersection Summary												
HCM 2000 Control Delay			83.3									F
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			120.0							20.0		
Intersection Capacity Utilization			96.2%									F
Analysis Period (min)			15									
c Critical Lane Group												

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	239	1498	495	62	421	68	171	182	122	52	136	51
Future Volume (veh/h)	239	1498	495	62	421	68	171	182	122	52	136	51
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	272	1702	311	70	478	46	194	207	107	59	155	36
Adj No. of Lanes	2	2	1	2	2	1	1	2	0	2	2	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	721	1715	767	111	986	496	112	810	402	106	1100	865
Arrive On Green	0.49	1.00	1.00	0.08	0.58	0.58	0.07	0.37	0.37	0.04	0.32	0.32
Sat Flow, veh/h	2956	3420	1530	2956	3420	1530	1524	2214	1100	2956	3420	1530
Grp Volume(v), veh/h	272	1702	311	70	478	46	194	158	156	59	155	36
Grp Sat Flow(s),veh/h/ln	1478	1710	1530	1478	1710	1530	1524	1710	1604	1478	1710	1530
Q Serve(g_s), s	6.9	0.0	0.0	2.8	9.9	0.9	8.8	7.7	8.2	2.4	3.9	0.0
Cycle Q Clear(g_c), s	6.9	0.0	0.0	2.8	9.9	0.9	8.8	7.7	8.2	2.4	3.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.69	1.00		1.00
Lane Grp Cap(c), veh/h	721	1715	767	111	986	496	112	626	587	106	1100	865
V/C Ratio(X)	0.38	0.99	0.41	0.63	0.48	0.09	1.74	0.25	0.27	0.56	0.14	0.04
Avail Cap(c_a), veh/h	721	1715	767	123	986	496	112	626	587	182	1100	865
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.59	0.59	0.59	0.94	0.94	0.94	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.0	0.0	0.0	54.7	20.2	9.2	55.6	26.6	26.7	56.9	28.9	11.6
Incr Delay (d2), s/veh	0.1	15.0	0.9	5.1	1.6	0.3	365.7	1.0	1.1	1.7	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	3.6	0.2	1.2	4.7	0.4	15.0	3.8	3.8	1.0	1.9	0.6
LnGrp Delay(d),s/veh	25.1	15.0	0.9	59.8	21.8	9.5	421.3	27.6	27.8	58.6	29.2	11.7
LnGrp LOS	C	B	A	E	C	A	F	C	C	E	C	B
Approach Vol, veh/h		2285			594			508			250	
Approach Delay, s/veh		14.3			25.3			178.0			33.6	
Approach LOS		B			C			F			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.1	65.9	14.2	44.0	35.0	40.0	8.9	49.3				
Change Period (Y+Rc), s	4.6	5.4	5.4	* 5.4	5.4	* 5.4	4.6	5.4				
Max Green Setting (Gmax), s	5.0	47.6	8.8	* 39	18.0	* 35	7.4	40.0				
Max Q Clear Time (g_c+I1), s	4.8	2.0	10.8	5.9	8.9	11.9	4.4	10.2				
Green Ext Time (p_c), s	0.0	31.6	0.0	1.0	7.8	4.4	0.0	1.9				
Intersection Summary												
HCM 2010 Ctrl Delay			40.3									
HCM 2010 LOS			D									
Notes												

Timings
4: Arrowhead Av. & Orange Show Rd.

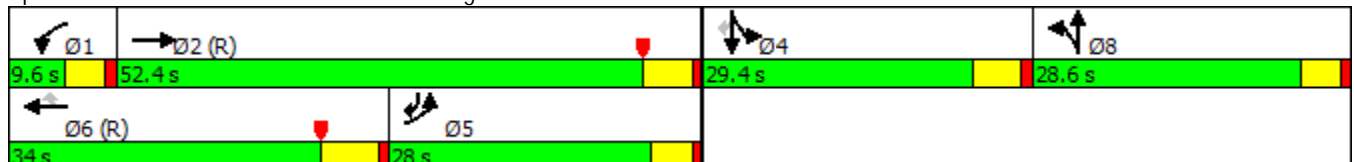


Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	408	1200	7	369	104	3	114	11	231
Future Volume (vph)	408	1200	7	369	104	3	114	11	231
Turn Type	Prot	NA	Prot	NA	Perm	NA	Split	NA	pm+ov
Protected Phases	5	2	1	6		8	4	4	5
Permitted Phases					6				4
Detector Phase	5	2	1	6	6	8	4	4	5
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	28.4	9.6	29.2	29.2	28.6	29.4	29.4	9.6
Total Split (s)	28.0	52.4	9.6	34.0	34.0	28.6	29.4	29.4	28.0
Total Split (%)	23.3%	43.7%	8.0%	28.3%	28.3%	23.8%	24.5%	24.5%	23.3%
Yellow Time (s)	3.6	4.4	3.6	5.2	5.2	3.6	4.4	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	6.2	6.2	4.6	5.4	5.4	4.6
Lead/Lag	Lag	Lag	Lead	Lead	Lead				Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				Yes
Recall Mode	None	C-Max	None	C-Max	C-Max	Max	Max	Max	None
Act Effect Green (s)	23.4	54.7	5.0	27.8	27.8	24.0	24.0	24.0	52.8
Actuated g/C Ratio	0.20	0.46	0.04	0.23	0.23	0.20	0.20	0.20	0.44
v/c Ratio	1.40	0.84	0.11	0.50	0.23	0.02	0.21	0.20	0.28
Control Delay	212.5	16.0	59.0	42.6	7.7	26.6	42.0	41.8	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	212.5	16.0	59.0	42.6	7.7	26.6	42.0	41.8	3.2
LOS	F	B	E	D	A	C	D	D	A
Approach Delay		65.3		35.3		26.6		16.8	
Approach LOS		E		D		C		B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 18.8 (16%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.40
 Intersection Signal Delay: 52.3
 Intersection LOS: D
 Intersection Capacity Utilization 72.6%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 4: Arrowhead Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
4: Arrowhead Av. & Orange Show Rd.























Gateway South Building 4 TIA (JN 10187)

3/28/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗	↖	↗		↖	↗	↗
Traffic Volume (vph)	408	1200	18	7	369	104	0	3	5	114	11	231
Future Volume (vph)	408	1200	18	7	369	104	0	3	5	114	11	231
Ideal Flow (vphp)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	6.2	6.2		4.6		5.4	5.4	4.6
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00		0.99		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00		0.95	0.96	1.00
Satd. Flow (prot)	1700	3600		1700	3600	1800		1800		1700	1800	1800
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00		0.95	0.96	1.00
Satd. Flow (perm)	1700	3600		1700	3600	1800		1800		1700	1800	1800
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	464	1364	20	8	419	118	0	3	6	130	12	262
RTOR Reduction (vph)	0	1	0	0	0	94	0	5	0	0	0	151
Lane Group Flow (vph)	464	1383	0	8	419	24	0	4	0	71	72	112
Confl. Peds. (#/hr)									6			7
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		8	8		4	4	5
Permitted Phases						6						4
Actuated Green, G (s)	27.1	51.0		1.0	24.1	24.1		24.0		24.0	24.0	51.1
Effective Green, g (s)	27.1	51.0		1.0	24.1	24.1		24.0		24.0	24.0	51.1
Actuated g/C Ratio	0.23	0.42		0.01	0.20	0.20		0.20		0.20	0.20	0.43
Clearance Time (s)	4.6	5.4		4.6	6.2	6.2		4.6		5.4	5.4	4.6
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0		3.0		3.0	3.0	2.0
Lane Grp Cap (vph)	383	1530		14	723	361		360		340	360	835
v/s Ratio Prot	c0.27	c0.38		0.00	c0.12			c0.00		c0.04	0.04	0.03
v/s Ratio Perm						0.01						0.03
v/c Ratio	1.21	0.90		0.57	0.58	0.07		0.01		0.21	0.20	0.13
Uniform Delay, d1	46.5	32.2		59.3	43.4	38.8		38.5		40.1	40.0	21.0
Progression Factor	0.72	0.48		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	97.5	1.0		30.5	3.4	0.4		0.1		1.4	1.2	0.0
Delay (s)	130.9	16.6		89.8	46.7	39.2		38.5		41.5	41.2	21.0
Level of Service	F	B		F	D	D		D		D	D	C
Approach Delay (s)		45.3			45.7			38.5			28.2	
Approach LOS		D			D			D			C	

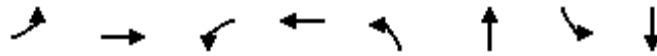
Intersection Summary		
HCM 2000 Control Delay	42.9	HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio	0.60	
Actuated Cycle Length (s)	120.0	Sum of lost time (s) 20.8
Intersection Capacity Utilization	72.6%	ICU Level of Service C
Analysis Period (min)	15	
c Critical Lane Group		

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	408	1200	18	7	369	104	0	3	5	114	11	231
Future Volume (veh/h)	408	1200	18	7	369	104	0	3	5	114	11	231
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	464	1364	19	8	419	98	0	3	6	139	0	168
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	672	2246	31	16	792	354	324	107	213	648	0	938
Arrive On Green	0.14	0.21	0.21	0.01	0.23	0.23	0.00	0.20	0.20	0.20	0.00	0.20
Sat Flow, veh/h	1619	3453	48	1619	3420	1530	1619	533	1067	3238	0	1514
Grp Volume(v), veh/h	464	675	708	8	419	98	0	0	9	139	0	168
Grp Sat Flow(s),veh/h/ln	1619	1710	1792	1619	1710	1530	1619	0	1600	1619	0	1514
Q Serve(g_s), s	32.8	42.8	42.8	0.6	12.9	6.3	0.0	0.0	0.5	4.3	0.0	0.0
Cycle Q Clear(g_c), s	32.8	42.8	42.8	0.6	12.9	6.3	0.0	0.0	0.5	4.3	0.0	0.0
Prop In Lane	1.00		0.03	1.00		1.00	1.00		0.67	1.00		1.00
Lane Grp Cap(c), veh/h	672	1112	1165	16	792	354	324	0	320	648	0	938
V/C Ratio(X)	0.69	0.61	0.61	0.51	0.53	0.28	0.00	0.00	0.03	0.21	0.00	0.18
Avail Cap(c_a), veh/h	672	1112	1165	67	792	354	324	0	320	648	0	938
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.09	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	44.4	33.3	33.3	59.1	40.4	37.8	0.0	0.0	38.6	40.1	0.0	10.0
Incr Delay (d2), s/veh	0.2	0.2	0.2	9.0	2.5	1.9	0.0	0.0	0.2	0.8	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.7	20.4	21.3	0.3	6.3	2.9	0.0	0.0	0.3	2.0	0.0	2.5
LnGrp Delay(d),s/veh	44.7	33.5	33.5	68.2	42.9	39.8	0.0	0.0	38.8	40.9	0.0	10.4
LnGrp LOS	D	C	C	E	D	D			D	D		B
Approach Vol, veh/h		1847			525			9			307	
Approach Delay, s/veh		36.3			42.7			38.8			24.2	
Approach LOS		D			D			D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.8	84.2		29.4	56.0	34.0		28.6				
Change Period (Y+Rc), s	4.6	5.4		5.4	5.4	* 6.2		4.6				
Max Green Setting (Gmax), s	5.0	47.0		24.0	23.4	* 28		24.0				
Max Q Clear Time (g_c+I1), s	2.6	44.8		6.3	34.8	14.9		2.5				
Green Ext Time (p_c), s	0.0	1.9		0.9	0.0	3.1		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			36.2									
HCM 2010 LOS			D									
Notes												

Timings

5: Washington Av./Washington Av. & Orange Show Rd.

3/27/2017

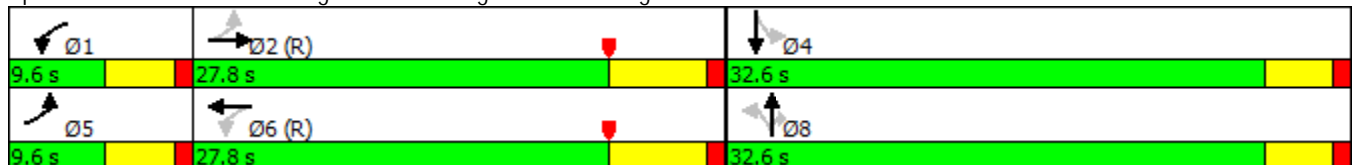


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↶	↶↷	↶	↶↷		↷		↷↶
Traffic Volume (vph)	50	1222	2	462	11	4	13	3
Future Volume (vph)	50	1222	2	462	11	4	13	3
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	9.6	23.2	32.6	32.6	32.6	32.6
Total Split (s)	9.6	27.8	9.6	27.8	32.6	32.6	32.6	32.6
Total Split (%)	13.7%	39.7%	13.7%	39.7%	46.6%	46.6%	46.6%	46.6%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effect Green (s)	58.7	56.2	57.7	51.0		13.6		13.6
Actuated g/C Ratio	0.84	0.80	0.82	0.73		0.19		0.19
v/c Ratio	0.04	0.46	0.00	0.20		0.05		0.07
Control Delay	5.4	10.7	7.0	8.3		19.5		15.5
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	5.4	10.7	7.0	8.3		19.5		15.5
LOS	A	B	A	A		B		B
Approach Delay		10.5		8.3		19.5		15.5
Approach LOS		B		A		B		B

Intersection Summary

Cycle Length: 70
 Actuated Cycle Length: 70
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.46
 Intersection Signal Delay: 10.1
 Intersection LOS: B
 Intersection Capacity Utilization 61.7%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 5: Washington Av./Washington Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 5: Washington Av./Washington Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)




















3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↑		↖	↑↑			↑	↗		↕	
Traffic Volume (vph)	50	1222	21	2	462	20	11	4	0	13	3	7
Future Volume (vph)	50	1222	21	2	462	20	11	4	0	13	3	7
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2		4.6	6.2			4.6			4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			1.00			0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.97	
Satd. Flow (prot)	1700	3600		1700	3600			1800			1800	
Flt Permitted	0.44	1.00		0.17	1.00			0.79			0.83	
Satd. Flow (perm)	1700	3600		1700	3600			1800			1800	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	54	1314	23	2	497	22	12	4	0	14	3	8
RTOR Reduction (vph)	0	1	0	0	3	0	0	0	0	0	7	0
Lane Group Flow (vph)	54	1336	0	2	516	0	0	16	0	0	18	0
Confl. Peds. (#/hr)			1									
Confl. Bikes (#/hr)			1			1						
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)	49.1	46.0		44.9	43.9			7.6			7.6	
Effective Green, g (s)	49.1	46.0		44.9	43.9			7.6			7.6	
Actuated g/C Ratio	0.70	0.66		0.64	0.63			0.11			0.11	
Clearance Time (s)	4.6	6.2		4.6	6.2			4.6			4.6	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	1192	2365		1090	2257			195			195	
v/s Ratio Prot	c0.00	c0.37		0.00	0.14							
v/s Ratio Perm	0.03			0.00				0.01			0.01	
v/c Ratio	0.05	0.56		0.00	0.23			0.08			0.09	
Uniform Delay, d1	3.3	6.5		4.9	5.7			28.1			28.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	1.0		0.0	0.2			0.2			0.2	
Delay (s)	3.3	7.5		4.9	5.9			28.2			28.3	
Level of Service	A	A		A	A			C			C	
Approach Delay (s)		7.4			5.9			28.2			28.3	
Approach LOS		A			A			C			C	

Intersection Summary		
HCM 2000 Control Delay	7.4	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.49	A
Actuated Cycle Length (s)	70.0	Sum of lost time (s)
Intersection Capacity Utilization	61.7%	15.4
Analysis Period (min)	15	ICU Level of Service
		B

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	1222	21	2	462	20	11	4	0	13	3	7
Future Volume (veh/h)	50	1222	21	2	462	20	11	4	0	13	3	7
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	54	1314	23	2	497	22	12	4	0	14	3	0
Adj No. of Lanes	1	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	692	2439	43	315	2220	98	156	39	104	170	27	0
Arrive On Green	0.05	0.71	0.71	0.00	0.67	0.67	0.07	0.07	0.00	0.07	0.07	0.00
Sat Flow, veh/h	1619	3438	60	1619	3333	147	981	571	1530	1123	401	0
Grp Volume(v), veh/h	54	653	684	2	255	264	16	0	0	17	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1788	1619	1710	1770	1551	0	1530	1524	0	0
Q Serve(g_s), s	0.7	12.6	12.6	0.0	4.1	4.1	0.0	0.0	0.0	0.1	0.0	0.0
Cycle Q Clear(g_c), s	0.7	12.6	12.6	0.0	4.1	4.1	0.6	0.0	0.0	0.6	0.0	0.0
Prop In Lane	1.00		0.03	1.00		0.08	0.75		1.00	0.82		0.00
Lane Grp Cap(c), veh/h	692	1213	1269	315	1139	1179	195	0	104	197	0	0
V/C Ratio(X)	0.08	0.54	0.54	0.01	0.22	0.22	0.08	0.00	0.00	0.09	0.00	0.00
Avail Cap(c_a), veh/h	733	1213	1269	426	1139	1179	698	0	612	691	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.74	0.74	0.74	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	3.0	4.8	4.8	4.5	4.6	4.6	30.7	0.0	0.0	30.7	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.7	1.6	0.0	0.3	0.3	0.2	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	6.4	6.7	0.0	2.0	2.1	0.3	0.0	0.0	0.3	0.0	0.0
LnGrp Delay(d),s/veh	3.0	6.5	6.4	4.5	4.9	4.9	30.9	0.0	0.0	30.9	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C			C		
Approach Vol, veh/h		1391			521			16				17
Approach Delay, s/veh		6.3			4.9			30.9				30.9
Approach LOS		A			A			C				C
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.8	55.9		9.3	7.9	52.8		9.3				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.0	21.6		28.0	5.0	21.6		28.0				
Max Q Clear Time (g_c+I1), s	2.0	14.6		2.6	2.7	6.1		2.6				
Green Ext Time (p_c), s	0.0	5.9		0.1	0.0	11.8		0.1				
Intersection Summary												
HCM 2010 Ctrl Delay			6.4									
HCM 2010 LOS			A									

Intersection												
Int Delay, s/veh	5.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↔	
Traffic Vol, veh/h	0	0	0	0	0	13	0	0	0	26	0	0
Future Vol, veh/h	0	0	0	0	0	13	0	0	0	26	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	70	70	70	70	70	70	70	70	70	70	70
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	19	0	0	0	37	0	0

Major/Minor	Major1			Major2			Minor2				
Conflicting Flow All	19	0	-	-	-	0	-	-	9	9	9
Stage 1	-	-	-	-	-	-	-	-	9	9	-
Stage 2	-	-	-	-	-	-	-	-	0	0	-
Critical Hdwy	4.1	-	-	-	-	-	-	-	6.4	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	5.4	5.5	-
Follow-up Hdwy	2.2	-	-	-	-	-	-	-	3.5	4	3.3
Pot Cap-1 Maneuver	1611	-	0	0	-	-	-	-	1017	890	1079
Stage 1	-	-	0	0	-	-	-	-	1019	892	-
Stage 2	-	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1611	-	-	-	-	-	-	-	1017	0	1079
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	1017	0	-
Stage 1	-	-	-	-	-	-	-	-	1019	0	-
Stage 2	-	-	-	-	-	-	-	-	-	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1611	-	-	-	1017
HCM Lane V/C Ratio	-	-	-	-	0.037
HCM Control Delay (s)	0	-	-	-	8.7
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Timings

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.

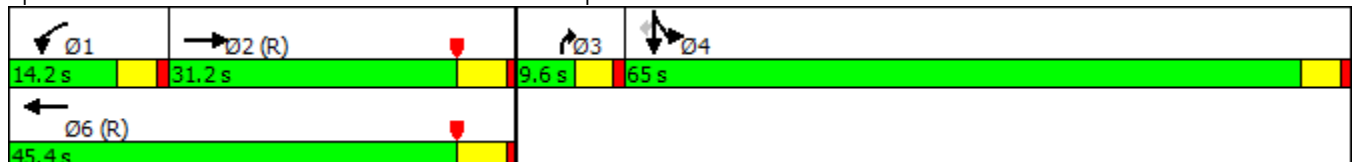


Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↖	↑↑	↗	↖	↗	↗
Traffic Volume (vph)	499	36	565	23	603	313	686
Future Volume (vph)	499	36	565	23	603	313	686
Turn Type	NA	Prot	NA	Prot	Split	NA	Perm
Protected Phases	2	1	6	3	4	4	
Permitted Phases							4
Detector Phase	2	1	6	3	4	4	4
Switch Phase							
Minimum Initial (s)	10.0	5.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	22.4	9.6	15.4	9.5	14.6	14.6	14.6
Total Split (s)	31.2	14.2	45.4	9.6	65.0	65.0	65.0
Total Split (%)	26.0%	11.8%	37.8%	8.0%	54.2%	54.2%	54.2%
Yellow Time (s)	4.4	3.6	4.4	3.5	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	4.6	5.4	4.5	4.6	4.6	4.6
Lead/Lag	Lag	Lead		Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes
Recall Mode	C-Max	None	C-Max	None	Max	Max	Max
Act Effect Green (s)	32.2	7.2	40.0	5.1	64.2	64.2	64.2
Actuated g/C Ratio	0.27	0.06	0.33	0.04	0.54	0.54	0.54
v/c Ratio	0.60	0.38	0.51	0.08	0.54	0.52	0.70
Control Delay	42.3	64.3	34.0	0.5	21.9	21.3	19.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.3	64.3	34.0	0.5	21.9	21.3	19.0
LOS	D	E	C	A	C	C	B
Approach Delay	42.3		35.8			20.5	
Approach LOS	D		D			C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 27.9
 Intersection LOS: C
 Intersection Capacity Utilization 69.7%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.






















HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑				↗	↖	↑↑	↗
Traffic Volume (vph)	0	499	32	36	565	0	0	0	23	603	313	686
Future Volume (vph)	0	499	32	36	565	0	0	0	23	603	313	686
Ideal Flow (vphpl)	1800	1800	1800	1700	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Lane Util. Factor		0.95		1.00	0.95				1.00	0.95	0.95	1.00
Frbp, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Frt		0.99		1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00				1.00	0.95	0.98	1.00
Satd. Flow (prot)		3600		1700	3600				1800	1700	1800	1800
Flt Permitted		1.00		0.95	1.00				1.00	0.95	0.98	1.00
Satd. Flow (perm)		3600		1700	3600				1800	1700	1800	1800
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	542	35	39	614	0	0	0	25	655	340	746
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	24	0	0	102
Lane Group Flow (vph)	0	573	0	39	614	0	0	0	1	491	504	644
Confl. Peds. (#/hr)			6			1						
Confl. Bikes (#/hr)						2						
Turn Type		NA		Prot	NA				Prot	Split	NA	Perm
Protected Phases		2		1	6				3	4	4	
Permitted Phases												4
Actuated Green, G (s)		28.6		5.0	38.2				3.1	64.2	64.2	64.2
Effective Green, g (s)		28.6		5.0	38.2				3.1	64.2	64.2	64.2
Actuated g/C Ratio		0.24		0.04	0.32				0.03	0.54	0.54	0.54
Clearance Time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Vehicle Extension (s)		3.0		2.0	3.0				3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		858		70	1146				46	909	963	963
v/s Ratio Prot		c0.16		0.02	c0.17				c0.00	0.29	0.28	
v/s Ratio Perm												c0.36
v/c Ratio		0.67		0.56	0.54				0.01	0.54	0.52	0.67
Uniform Delay, d1		41.4		56.4	33.6				57.0	18.2	18.0	20.2
Progression Factor		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		4.1		5.4	1.8				0.1	2.3	2.0	3.7
Delay (s)		45.5		61.8	35.4				57.1	20.5	20.1	23.9
Level of Service		D		E	D				E	C	C	C
Approach Delay (s)		45.5			37.0			57.1			21.8	
Approach LOS		D			D			E			C	

Intersection Summary		
HCM 2000 Control Delay	30.0	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.65	
Actuated Cycle Length (s)	120.0	Sum of lost time (s) 19.1
Intersection Capacity Utilization	69.7%	ICU Level of Service C
Analysis Period (min)	15	

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	499	32	36	565	0	0	0	23	603	313	686
Future Volume (veh/h)	0	499	32	36	565	0	0	0	23	603	313	686
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	0	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	542	24	39	614	0	0	0	12	498	560	744
Adj No. of Lanes	0	2	0	1	2	0	0	0	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1150	51	49	1414	0	0	0	0	815	906	770
Arrive On Green	0.00	0.34	0.34	0.03	0.41	0.00	0.00	0.00	0.00	0.50	0.50	0.50
Sat Flow, veh/h	0	3425	147	1619	3510	0		0		1619	1800	1530
Grp Volume(v), veh/h	0	278	288	39	614	0		0.0		498	560	744
Grp Sat Flow(s),veh/h/ln	0	1710	1772	1619	1710	0				1619	1800	1530
Q Serve(g_s), s	0.0	15.2	15.3	2.9	15.4	0.0				26.5	26.9	56.4
Cycle Q Clear(g_c), s	0.0	15.2	15.3	2.9	15.4	0.0				26.5	26.9	56.4
Prop In Lane	0.00		0.08	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	589	611	49	1414	0				815	906	770
V/C Ratio(X)	0.00	0.47	0.47	0.79	0.43	0.00				0.61	0.62	0.97
Avail Cap(c_a), veh/h	0	589	611	130	1414	0				815	906	770
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.73	0.73	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	30.8	30.8	57.8	25.2	0.0				21.4	21.5	28.8
Incr Delay (d2), s/veh	0.0	2.7	2.6	7.6	0.7	0.0				3.4	3.2	25.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.6	7.9	1.4	7.4	0.0				12.5	14.2	29.1
LnGrp Delay(d),s/veh	0.0	33.4	33.4	65.5	25.9	0.0				24.8	24.6	54.0
LnGrp LOS		C	C	E	C					C	C	D
Approach Vol, veh/h		566			653						1802	
Approach Delay, s/veh		33.4			28.2						36.8	
Approach LOS		C			C						D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	8.2	46.8		65.0		55.0						
Change Period (Y+Rc), s	4.6	5.4		4.6		5.4						
Max Green Setting (Gmax), s	9.6	25.8		60.4		40.0						
Max Q Clear Time (g_c+I1), s	4.9	17.3		58.4		17.4						
Green Ext Time (p_c), s	0.0	4.4		1.5		7.6						
Intersection Summary												
HCM 2010 Ctrl Delay				34.3								
HCM 2010 LOS				C								
Notes												

Timings

9: Waterman Av. & Orange Show Rd./Orange Show Rd.

3/27/2017

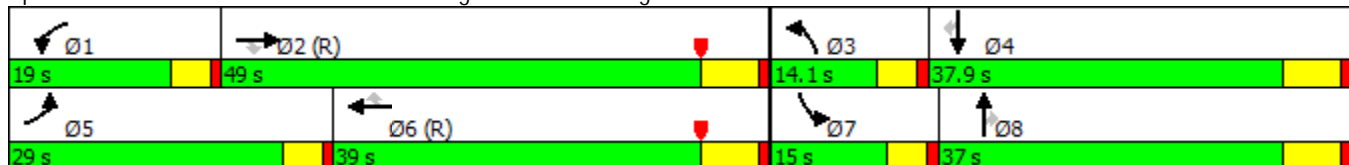


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	202	627	392	169	333	92	85	521	152	81	632	74
Future Volume (vph)	202	627	392	169	333	92	85	521	152	81	632	74
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.2	35.2	9.6	35.2	35.2	9.6	33.2	33.2	9.6	33.2	33.2
Total Split (s)	29.0	49.0	49.0	19.0	39.0	39.0	14.1	37.0	37.0	15.0	37.9	37.9
Total Split (%)	24.2%	40.8%	40.8%	15.8%	32.5%	32.5%	11.8%	30.8%	30.8%	12.5%	31.6%	31.6%
Yellow Time (s)	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Act Effect Green (s)	20.0	42.8	42.8	14.4	37.2	37.2	9.0	31.8	31.8	9.4	32.2	32.2
Actuated g/C Ratio	0.17	0.36	0.36	0.12	0.31	0.31	0.08	0.26	0.26	0.08	0.27	0.27
v/c Ratio	0.83	0.57	0.58	0.97	0.69	0.16	0.78	0.64	0.29	0.71	0.76	0.14
Control Delay	71.4	33.3	17.5	107.7	45.3	2.0	91.3	42.8	6.4	81.3	46.6	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.4	33.3	17.5	107.7	45.3	2.0	91.3	42.8	6.4	81.3	46.6	0.5
LOS	E	C	B	F	D	A	F	D	A	F	D	A
Approach Delay		34.5			56.4			40.9			45.8	
Approach LOS		C			E			D			D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.97
 Intersection Signal Delay: 42.5
 Intersection LOS: D
 Intersection Capacity Utilization 72.7%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗↗	↘	↘	↗	↘	↘	↗↗	↘	↘	↗↗	↘
Traffic Volume (vph)	202	627	392	169	333	92	85	521	152	81	632	74
Future Volume (vph)	202	627	392	169	333	92	85	521	152	81	632	74
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	235	729	456	197	387	107	99	606	177	94	735	86
RTOR Reduction (vph)	0	0	152	0	0	74	0	0	130	0	0	63
Lane Group Flow (vph)	235	729	304	197	387	33	99	606	47	94	735	23
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7		4
Permitted Phases			2			6			8			4
Actuated Green, G (s)	20.0	42.8	42.8	14.4	37.2	37.2	9.0	31.8	31.8	9.4	32.2	32.2
Effective Green, g (s)	20.0	42.8	42.8	14.4	37.2	37.2	9.0	31.8	31.8	9.4	32.2	32.2
Actuated g/C Ratio	0.17	0.36	0.36	0.12	0.31	0.31	0.08	0.27	0.27	0.08	0.27	0.27
Clearance Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	283	1284	642	204	558	558	127	954	477	133	966	483
v/s Ratio Prot	c0.14	0.20		c0.12	c0.21		c0.06	0.17		0.06	c0.20	
v/s Ratio Perm			0.17			0.02			0.03			0.01
v/c Ratio	0.83	0.57	0.47	0.97	0.69	0.06	0.78	0.64	0.10	0.71	0.76	0.05
Uniform Delay, d1	48.4	31.1	29.9	52.6	36.4	29.1	54.5	39.0	33.3	54.0	40.4	32.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	17.6	1.8	2.5	52.4	7.0	0.2	23.5	3.2	0.4	13.1	5.6	0.2
Delay (s)	65.9	33.0	32.4	105.0	43.3	29.3	78.0	42.2	33.7	67.0	46.0	32.7
Level of Service	E	C	C	F	D	C	E	D	C	E	D	C
Approach Delay (s)		38.2			58.7			44.5			46.9	
Approach LOS		D			E			D			D	

Intersection Summary

HCM 2000 Control Delay	45.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	202	627	392	169	333	92	85	521	152	81	632	74
Future Volume (veh/h)	202	627	392	169	333	92	85	521	152	81	632	74
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	235	729	357	197	387	66	99	606	141	94	735	63
Adj No. of Lanes	1	2	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	260	1237	553	194	578	492	120	915	409	115	903	404
Arrive On Green	0.16	0.36	0.36	0.12	0.32	0.32	0.07	0.27	0.27	0.07	0.26	0.26
Sat Flow, veh/h	1619	3420	1530	1619	1800	1530	1619	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	235	729	357	197	387	66	99	606	141	94	735	63
Grp Sat Flow(s),veh/h/ln	1619	1710	1530	1619	1800	1530	1619	1710	1530	1619	1710	1530
Q Serve(g_s), s	17.1	20.8	23.3	14.4	22.3	3.7	7.2	18.9	8.9	6.9	24.2	3.8
Cycle Q Clear(g_c), s	17.1	20.8	23.3	14.4	22.3	3.7	7.2	18.9	8.9	6.9	24.2	3.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	260	1237	553	194	578	492	120	915	409	115	903	404
V/C Ratio(X)	0.90	0.59	0.65	1.01	0.67	0.13	0.82	0.66	0.34	0.82	0.81	0.16
Avail Cap(c_a), veh/h	329	1237	553	194	578	492	128	915	409	140	903	404
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.88	0.88	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.5	31.1	31.9	52.8	35.2	28.9	54.8	39.1	35.5	55.0	41.4	33.9
Incr Delay (d2), s/veh	19.1	1.8	5.1	68.2	6.1	0.6	29.8	3.8	2.3	22.1	7.9	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.0	10.1	10.7	10.1	12.0	1.6	4.2	9.4	4.0	3.8	12.4	1.7
LnGrp Delay(d),s/veh	68.6	32.9	37.0	121.1	41.3	29.5	84.5	42.9	37.8	77.1	49.3	34.7
LnGrp LOS	E	C	D	F	D	C	F	D	D	E	D	C
Approach Vol, veh/h		1321			650			846			892	
Approach Delay, s/veh		40.3			64.3			46.9			51.2	
Approach LOS		D			E			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.0	49.6	13.5	37.9	23.8	44.8	13.1	38.3				
Change Period (Y+Rc), s	4.6	6.2	4.6	6.2	4.6	6.2	4.6	6.2				
Max Green Setting (Gmax), s	14.4	42.8	9.5	31.7	24.4	32.8	10.4	30.8				
Max Q Clear Time (g_c+I1), s	16.4	25.3	9.2	26.2	19.1	24.3	8.9	20.9				
Green Ext Time (p_c), s	0.0	10.4	0.0	3.7	0.1	6.1	0.0	5.8				
Intersection Summary												
HCM 2010 Ctrl Delay			48.6									
HCM 2010 LOS			D									

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	3	13	8	755	1224	16
Future Vol, veh/h	3	13	8	755	1224	16
Conflicting Peds, #/hr	0	0	0	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	75	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	4	16	10	944	1530	20

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	2034	777	1552 0
Stage 1	1542	-	- -
Stage 2	492	-	- -
Critical Hdwy	6.8	6.9	4.1 -
Critical Hdwy Stg 1	5.8	-	- -
Critical Hdwy Stg 2	5.8	-	- -
Follow-up Hdwy	3.5	3.3	2.2 -
Pot Cap-1 Maneuver	*51	*594	669 -
Stage 1	*387	-	- -
Stage 2	*749	-	- -
Platoon blocked, %		1	1 -
Mov Cap-1 Maneuver	*50	*592	669 -
Mov Cap-2 Maneuver	*252	-	- -
Stage 1	*386	-	- -
Stage 2	*737	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	12.8	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	669	-	252	592	-	-
HCM Lane V/C Ratio	0.015	-	0.015	0.027	-	-
HCM Control Delay (s)	10.5	-	19.5	11.3	-	-
HCM Lane LOS	B	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0	0.1	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Timings
11: Waterman Av. & Driveway 2/Park Center Dr.



Lane Group	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	Ø4
Lane Configurations		↖	↗	↖	↕	↗	↖	↕	
Traffic Volume (vph)	21	1	8	21	817	125	48	960	
Future Volume (vph)	21	1	8	21	817	125	48	960	
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		8		5	2		1	6	4
Permitted Phases	8		8	2		2	6		
Detector Phase	8	8	8	5	2	2	1	6	
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	21.6	21.6	21.6	9.6	23.2	23.2	9.6	33.2	14.6
Total Split (s)	21.6	21.6	21.6	9.6	32.0	32.0	11.4	33.8	21.6
Total Split (%)	33.2%	33.2%	33.2%	14.8%	49.2%	49.2%	17.5%	52.0%	33%
Yellow Time (s)	3.6	3.6	3.6	3.6	5.2	5.2	3.6	5.2	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Lead/Lag				Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max	None
Act Effect Green (s)		11.4	11.4	50.0	47.8	47.8	54.5	51.4	
Actuated g/C Ratio		0.18	0.18	0.77	0.74	0.74	0.84	0.79	
v/c Ratio		0.09	0.02	0.07	0.38	0.11	0.04	0.42	
Control Delay		21.7	0.1	4.3	8.2	2.9	3.4	7.7	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		21.7	0.1	4.3	8.2	2.9	3.4	7.7	
LOS		C	A	A	A	A	A	A	
Approach Delay		15.9			7.4			7.5	
Approach LOS		B			A			A	

Intersection Summary

Cycle Length: 65
 Actuated Cycle Length: 65
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.42
 Intersection Signal Delay: 7.6
 Intersection LOS: A
 Intersection Capacity Utilization 53.5%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 11: Waterman Av. & Driveway 2/Park Center Dr.



HCM Signalized Intersection Capacity Analysis
 11: Waterman Av. & Driveway 2/Park Center Dr.





















Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↕	↕	↕	↕↕	
Traffic Volume (vph)	0	0	0	21	1	8	21	817	125	48	960	5
Future Volume (vph)	0	0	0	21	1	8	21	817	125	48	960	5
Ideal Flow (vphp)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)					4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor					1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes					1.00	1.00	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes					1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt					1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected					0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)					1800	1800	1615	3600	1800	1700	3600	
Flt Permitted					0.73	1.00	0.21	1.00	1.00	0.25	1.00	
Satd. Flow (perm)					1800	1800	357	3600	1800	1700	3600	
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	0	0	0	26	1	10	26	1009	154	59	1185	6
RTOR Reduction (vph)	0	0	0	0	0	9	0	0	54	0	0	0
Lane Group Flow (vph)	0	0	0	0	27	1	26	1009	100	59	1191	0
Confl. Bikes (#/hr)									2			2
Turn Type				Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1		6
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)					5.4	5.4	42.8	40.8	40.8	45.6	42.2	
Effective Green, g (s)					5.4	5.4	42.8	40.8	40.8	45.6	42.2	
Actuated g/C Ratio					0.08	0.08	0.66	0.63	0.63	0.70	0.65	
Clearance Time (s)					4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Vehicle Extension (s)					3.0	3.0	2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)					149	149	273	2259	1129	1192	2337	
v/s Ratio Prot							c0.00	0.28		0.00	c0.33	
v/s Ratio Perm					0.01	0.00	0.06		0.06	0.03		
v/c Ratio					0.18	0.01	0.10	0.45	0.09	0.05	0.51	
Uniform Delay, d1					27.7	27.3	4.0	6.3	4.8	3.2	6.0	
Progression Factor					1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2					0.6	0.0	0.1	0.6	0.2	0.0	0.8	
Delay (s)					28.3	27.4	4.1	6.9	4.9	3.2	6.8	
Level of Service					C	C	A	A	A	A	A	
Approach Delay (s)		0.0			28.1			6.6			6.6	
Approach LOS		A			C			A			A	

Intersection Summary		
HCM 2000 Control Delay	6.9	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.46	A
Actuated Cycle Length (s)	65.0	Sum of lost time (s)
Intersection Capacity Utilization	53.5%	15.4
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		A

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	21	1	8	21	817	125	48	960	5
Future Volume (veh/h)	0	0	0	21	1	8	21	817	125	48	960	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	0	0	26	1	8	26	1009	150	59	1185	6
Adj No. of Lanes	0	1	0	0	1	1	1	2	1	1	2	0
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	130	0	208	6	110	378	2191	959	420	2310	12
Arrive On Green	0.00	0.00	0.00	0.07	0.07	0.07	0.03	0.64	0.64	0.05	0.66	0.66
Sat Flow, veh/h	0	1800	0	1374	82	1530	1619	3420	1498	1619	3489	18
Grp Volume(v), veh/h	0	0	0	27	0	8	26	1009	150	59	581	610
Grp Sat Flow(s),veh/h/ln	0	1800	0	1456	0	1530	1619	1710	1498	1619	1710	1796
Q Serve(g_s), s	0.0	0.0	0.0	1.0	0.0	0.3	0.4	9.8	2.6	0.8	11.3	11.3
Cycle Q Clear(g_c), s	0.0	0.0	0.0	1.1	0.0	0.3	0.4	9.8	2.6	0.8	11.3	11.3
Prop In Lane	0.00		0.00	0.96		1.00	1.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	0	130	0	214	0	110	378	2191	959	420	1132	1190
V/C Ratio(X)	0.00	0.00	0.00	0.13	0.00	0.07	0.07	0.46	0.16	0.14	0.51	0.51
Avail Cap(c_a), veh/h	0	471	0	489	0	400	456	2191	959	508	1132	1190
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	28.5	0.0	28.1	4.4	6.0	4.7	4.1	5.6	5.6
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.3	0.0	0.3	0.0	0.7	0.3	0.1	1.7	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.5	0.0	0.1	0.2	4.7	1.1	0.3	5.7	5.9
LnGrp Delay(d),s/veh	0.0	0.0	0.0	28.8	0.0	28.4	4.4	6.7	5.0	4.1	7.3	7.2
LnGrp LOS				C		C	A	A	A	A	A	A
Approach Vol, veh/h		0			35			1185			1250	
Approach Delay, s/veh		0.0			28.7			6.4			7.1	
Approach LOS					C			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.9	47.8		9.3	6.5	49.2		9.3				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	6.8	25.8		17.0	5.0	27.6		17.0				
Max Q Clear Time (g_c+I1), s	2.8	11.8		0.0	2.4	13.3		3.1				
Green Ext Time (p_c), s	0.0	12.2		0.0	0.0	12.5		0.1				
Intersection Summary												
HCM 2010 Ctrl Delay				7.1								
HCM 2010 LOS				A								

Timings

12: Waterman Av./Waterman Av. & Hospitality Ln.

3/27/2017

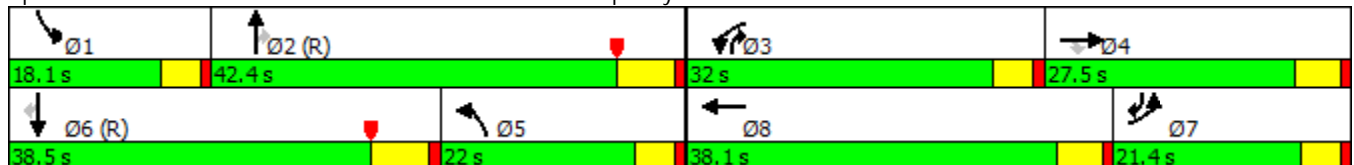


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↕	↘	↙↘	↕	↙↘	↕	↙↘	↙	↕↕	↘
Traffic Volume (vph)	163	188	143	440	410	294	930	848	133	569	146
Future Volume (vph)	163	188	143	440	410	294	930	848	133	569	146
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8	5	2	3	1	6	7
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	3	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	15.1	15.1	9.6	38.1	9.6	36.2	9.6	9.6	36.2	9.6
Total Split (s)	21.4	27.5	27.5	32.0	38.1	22.0	42.4	32.0	18.1	38.5	21.4
Total Split (%)	17.8%	22.9%	22.9%	26.7%	31.8%	18.3%	35.3%	26.7%	15.1%	32.1%	17.8%
Yellow Time (s)	3.6	4.1	4.1	3.6	4.1	3.6	5.2	3.6	3.6	5.2	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	5.1	4.6	5.1	4.6	6.2	4.6	4.6	6.2	4.6
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	15.8	18.1	18.1	22.6	25.0	17.4	45.3	74.2	13.4	41.4	63.3
Actuated g/C Ratio	0.13	0.15	0.15	0.19	0.21	0.14	0.38	0.62	0.11	0.34	0.53
v/c Ratio	0.78	0.44	0.26	0.78	0.75	0.68	0.74	0.38	0.75	0.33	0.16
Control Delay	74.0	44.6	2.4	55.8	47.8	56.9	38.1	6.6	75.5	31.1	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.0	44.6	2.4	55.8	47.8	56.9	38.1	6.6	75.5	31.1	5.6
LOS	E	D	A	E	D	E	D	A	E	C	A
Approach Delay		45.7			51.4		27.9			33.7	
Approach LOS		D			D		C			C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 105
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 36.3
 Intersection LOS: D
 Intersection Capacity Utilization 82.0%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 12: Waterman Av./Waterman Av. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
 12: Waterman Av./Waterman Av. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)
























3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	188	143	440	410	133	294	930	848	133	569	146
Future Volume (vph)	163	188	143	440	410	133	294	930	848	133	569	146
Ideal Flow (vphpl)	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Lane Util. Factor	1.00	0.91	0.91	0.97	0.95		0.97	0.95	0.88	1.00	0.91	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	175	202	154	473	441	143	316	1000	912	143	612	157
RTOR Reduction (vph)	0	16	92	0	29	0	0	0	184	0	0	61
Lane Group Flow (vph)	175	232	16	473	556	0	316	1000	728	143	612	96
Confl. Peds. (#/hr)							9		1			3
Confl. Bikes (#/hr)							2		3			
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4						2			6
Actuated Green, G (s)	15.8	18.2	18.2	22.6	25.0		17.4	45.3	67.9	13.4	41.3	57.1
Effective Green, g (s)	15.8	18.2	18.2	22.6	25.0		17.4	45.3	67.9	13.4	41.3	57.1
Actuated g/C Ratio	0.13	0.15	0.15	0.19	0.21		0.14	0.38	0.57	0.11	0.34	0.48
Clearance Time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	4.0	2.0	2.0	4.0	2.0
Lane Grp Cap (vph)	223	546	273	602	750		464	1359	2037	189	1858	925
v/s Ratio Prot	c0.10	c0.06		0.15	c0.15		0.10	c0.28	0.07	c0.08	0.11	0.01
v/s Ratio Perm			0.01						0.13			0.04
v/c Ratio	0.78	0.42	0.06	0.79	0.74		0.68	0.74	0.36	0.76	0.33	0.10
Uniform Delay, d1	50.5	46.2	43.6	46.4	44.5		48.7	32.2	14.2	51.7	29.1	17.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.3	0.5	0.1	6.2	4.0		3.3	3.6	0.0	14.2	0.5	0.0
Delay (s)	65.7	46.7	43.7	52.6	48.4		51.9	35.8	14.2	65.9	29.6	17.4
Level of Service	E	D	D	D	D		D	D	B	E	C	B
Approach Delay (s)		52.3			50.3			29.2			33.2	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	37.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	82.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	163	188	143	440	410	133	294	930	848	133	569	146
Future Volume (veh/h)	163	188	143	440	410	133	294	930	848	133	569	146
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	175	202	80	473	441	128	316	1000	480	143	612	59
Adj No. of Lanes	1	2	1	2	2	0	2	2	2	1	3	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	203	587	250	527	551	158	607	1317	1492	167	1323	603
Arrive On Green	0.13	0.16	0.16	0.18	0.21	0.21	0.21	0.39	0.39	0.10	0.27	0.27
Sat Flow, veh/h	1619	3600	1530	2956	2605	749	2956	3420	2628	1619	4914	1525
Grp Volume(v), veh/h	175	202	80	473	288	281	316	1000	480	143	612	59
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	1710	1644	1478	1710	1314	1619	1638	1525
Q Serve(g_s), s	12.7	6.0	3.6	18.8	19.2	19.5	11.4	30.5	11.7	10.4	12.5	0.0
Cycle Q Clear(g_c), s	12.7	6.0	3.6	18.8	19.2	19.5	11.4	30.5	11.7	10.4	12.5	0.0
Prop In Lane	1.00		1.00	1.00		0.46	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	203	587	250	527	362	348	607	1317	1492	167	1323	603
V/C Ratio(X)	0.86	0.34	0.32	0.90	0.80	0.81	0.52	0.76	0.32	0.86	0.46	0.10
Avail Cap(c_a), veh/h	227	672	286	675	470	452	607	1317	1492	182	1323	603
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.64	0.64	0.64	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.4	44.5	18.3	48.2	44.9	45.0	42.4	32.1	14.0	53.0	36.6	22.9
Incr Delay (d2), s/veh	23.2	0.3	0.7	7.5	4.7	5.4	0.4	4.2	0.6	27.7	1.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.0	3.0	1.6	8.2	9.5	9.4	4.7	15.1	4.3	6.0	5.8	1.3
LnGrp Delay(d),s/veh	74.7	44.9	19.0	55.8	49.5	50.4	42.8	36.2	14.6	80.7	37.8	23.2
LnGrp LOS	E	D	B	E	D	D	D	D	B	F	D	C
Approach Vol, veh/h		457			1042			1796			814	
Approach Delay, s/veh		51.7			52.6			31.6			44.2	
Approach LOS		D			D			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.9	52.4	26.0	24.7	30.8	38.5	20.2	30.5				
Change Period (Y+Rc), s	4.6	6.2	4.6	5.1	6.2	* 6.2	5.1	* 5.1				
Max Green Setting (Gmax), s	13.5	36.2	27.4	22.4	17.4	* 32	16.8	* 33				
Max Q Clear Time (g_c+I1), s	12.4	32.5	20.8	8.0	13.4	14.5	14.7	21.5				
Green Ext Time (p_c), s	0.0	3.0	0.6	1.4	1.6	5.0	0.4	2.6				
Intersection Summary												
HCM 2010 Ctrl Delay			41.7									
HCM 2010 LOS			D									
Notes												

Intersection

Int Delay, s/veh 0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↖ ↗	↖ ↗	↖ ↗	
Traffic Vol, veh/h	0	0	297	2071	991	164
Future Vol, veh/h	0	0	297	2071	991	164
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	0	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	309	2157	1032	171

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	516	1032 0
Stage 1	-	-	- -
Stage 2	-	-	- -
Critical Hdwy	-	7.1	5.3 -
Critical Hdwy Stg 1	-	-	- -
Critical Hdwy Stg 2	-	-	- -
Follow-up Hdwy	-	3.9	3.1 -
Pot Cap-1 Maneuver	0	*702	*883 -
Stage 1	0	-	- -
Stage 2	0	-	- -
Platoon blocked, %	-	1	1 -
Mov Cap-1 Maneuver	-	*702	*883 -
Mov Cap-2 Maneuver	-	-	- -
Stage 1	-	-	- -
Stage 2	-	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	0	1.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	* 883	-	-	-	-
HCM Lane V/C Ratio	0.35	-	-	-	-
HCM Control Delay (s)	11.3	-	0	-	-
HCM Lane LOS	B	-	A	-	-
HCM 95th %tile Q(veh)	1.6	-	-	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection

Int Delay, s/veh 0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations						↗		↕			↕	
Traffic Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Future Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	-	-	-	Free	-	-	-	-	-	None
Storage Length	-	-	-	-	-	0	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	1209	0	998	0	0	746	171

Major/Minor

	Minor1	Major1	Major2
Conflicting Flow All	-	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	0	0	0
Stage 1	0	0	0
Stage 2	0	0	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach

	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt

	NBTWBLn1	SBT	SBR
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	-	0	-
HCM Lane LOS	-	A	-
HCM 95th %tile Q(veh)	-	-	-

Intersection

Int Delay, s/veh

Movement	NWL	NWR
Lane Configurations		
Traffic Vol, veh/h	0	0
Future Vol, veh/h	0	0
Conflicting Peds, #/hr	0	0
Sign Control	Stop	Stop
RT Channelized	-	-
Storage Length	-	-
Veh in Median Storage, #	0	-
Grade, %	0	-
Peak Hour Factor	95	95
Heavy Vehicles, %	0	0
Mvmt Flow	0	0

Major/Minor

Conflicting Flow All		
Stage 1		
Stage 2		
Critical Hdwy		
Critical Hdwy Stg 1		
Critical Hdwy Stg 2		
Follow-up Hdwy		
Pot Cap-1 Maneuver		
Stage 1		
Stage 2		
Platoon blocked, %		
Mov Cap-1 Maneuver		
Mov Cap-2 Maneuver		
Stage 1		
Stage 2		

Approach

HCM Control Delay, s	
HCM LOS	

Minor Lane/Major Mvmt

Timings

15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.

3/27/2017

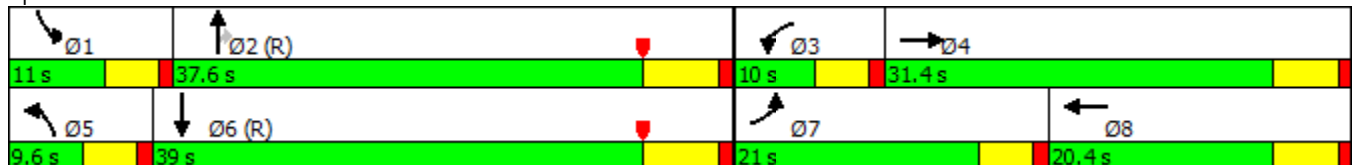


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖↗	↕	↖	↕	↖	↕	↗	↖	↕
Traffic Volume (vph)	512	388	112	240	61	864	114	86	469
Future Volume (vph)	512	388	112	240	61	864	114	86	469
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	9.6	31.4	9.6	15.4	9.6	36.2	36.2	9.6	36.2
Total Split (s)	21.0	31.4	10.0	20.4	9.6	37.6	37.6	11.0	39.0
Total Split (%)	23.3%	34.9%	11.1%	22.7%	10.7%	41.8%	41.8%	12.2%	43.3%
Yellow Time (s)	3.6	4.4	3.6	4.4	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	5.4	4.6	6.2	6.2	4.6	6.2
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)	16.2	23.5	5.4	12.6	6.0	33.0	33.0	7.3	36.3
Actuated g/C Ratio	0.18	0.26	0.06	0.14	0.07	0.37	0.37	0.08	0.40
v/c Ratio	0.92	0.63	1.15	0.65	0.57	0.68	0.15	0.65	0.51
Control Delay	60.2	24.8	175.3	33.8	62.4	27.7	0.8	64.0	17.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.2	24.8	175.3	33.8	62.4	27.7	0.8	64.0	17.8
LOS	E	C	F	C	E	C	A	E	B
Approach Delay		40.6		67.5		26.8			22.5
Approach LOS		D		E		C			C

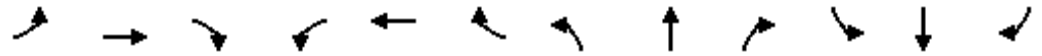
Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.15
 Intersection Signal Delay: 35.8
 Intersection LOS: D
 Intersection Capacity Utilization 76.2%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.

























HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔	↕↔		↔	↕↕	↔	↔	↕↔	
Traffic Volume (vph)	512	388	243	112	240	119	61	864	114	86	469	292
Future Volume (vph)	512	388	243	112	240	119	61	864	114	86	469	292
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.94		1.00	0.95		1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Flt Permitted	1.00	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	533	404	253	117	250	124	64	900	119	90	489	304
RTOR Reduction (vph)	0	113	0	0	70	0	0	0	75	0	103	0
Lane Group Flow (vph)	533	544	0	117	304	0	64	900	44	90	690	0
Confl. Peds. (#/hr)			3						1			4
Confl. Bikes (#/hr)			1						1			
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	16.2	23.5		5.4	12.7		5.0	33.0	33.0	7.3	35.3	
Effective Green, g (s)	16.2	23.5		5.4	12.7		5.0	33.0	33.0	7.3	35.3	
Actuated g/C Ratio	0.18	0.26		0.06	0.14		0.06	0.37	0.37	0.08	0.39	
Clearance Time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	576	940		102	508		94	1320	660	137	1412	
v/s Ratio Prot	c0.17	c0.15		0.07	0.08		0.04	c0.25		c0.05	0.19	
v/s Ratio Perm									0.02			
v/c Ratio	0.93	0.58		1.15	0.60		0.68	0.68	0.07	0.66	0.49	
Uniform Delay, d1	36.3	28.9		42.3	36.3		41.7	24.1	18.5	40.1	20.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	20.6	0.9		134.1	1.9		14.9	2.9	0.2	8.4	1.2	
Delay (s)	56.9	29.8		176.4	38.1		56.7	26.9	18.7	48.5	21.8	
Level of Service	E	C		F	D		E	C	B	D	C	
Approach Delay (s)		41.9			71.1			27.8			24.5	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	37.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	20.8
Intersection Capacity Utilization	76.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	512	388	243	112	240	119	61	864	114	86	469	292
Future Volume (veh/h)	512	388	243	112	240	119	61	864	114	86	469	292
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	533	404	199	117	250	99	64	900	77	90	489	249
Adj No. of Lanes	2	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	539	594	289	97	351	135	79	1273	562	112	862	436
Arrive On Green	0.18	0.27	0.27	0.06	0.15	0.15	0.05	0.37	0.37	0.07	0.39	0.39
Sat Flow, veh/h	2956	2220	1079	1619	2415	931	1619	3420	1510	1619	2197	1113
Grp Volume(v), veh/h	533	310	293	117	175	174	64	900	77	90	380	358
Grp Sat Flow(s),veh/h/ln	1478	1710	1589	1619	1710	1636	1619	1710	1510	1619	1710	1600
Q Serve(g_s), s	16.2	14.6	14.9	5.4	8.8	9.2	3.5	20.2	3.0	4.9	15.6	15.8
Cycle Q Clear(g_c), s	16.2	14.6	14.9	5.4	8.8	9.2	3.5	20.2	3.0	4.9	15.6	15.8
Prop In Lane	1.00		0.68	1.00		0.57	1.00		1.00	1.00		0.70
Lane Grp Cap(c), veh/h	539	458	425	97	249	238	79	1273	562	112	671	627
V/C Ratio(X)	0.99	0.68	0.69	1.20	0.70	0.73	0.81	0.71	0.14	0.81	0.57	0.57
Avail Cap(c_a), veh/h	539	494	459	97	285	273	90	1273	562	115	671	627
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.81	0.81	0.81	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.7	29.5	29.6	42.3	36.6	36.8	42.4	24.1	18.7	41.3	21.4	21.4
Incr Delay (d2), s/veh	32.1	2.7	3.2	156.3	6.5	8.3	32.5	3.3	0.5	30.0	3.4	3.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.0	7.2	6.9	6.6	4.6	4.7	2.3	10.1	1.3	3.1	8.0	7.6
LnGrp Delay(d),s/veh	68.8	32.2	32.8	198.6	43.1	45.1	74.8	27.4	19.2	71.3	24.8	25.2
LnGrp LOS	E	C	C	F	D	D	E	C	B	E	C	C
Approach Vol, veh/h		1136			466			1041			828	
Approach Delay, s/veh		49.5			82.9			29.7			30.0	
Approach LOS		D			F			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.8	39.7	10.0	29.5	9.0	41.5	21.0	18.5				
Change Period (Y+Rc), s	4.6	6.2	4.6	5.4	4.6	6.2	4.6	5.4				
Max Green Setting (Gmax), s	6.4	31.4	5.4	26.0	5.0	32.8	16.4	15.0				
Max Q Clear Time (g_c+I1), s	6.9	22.2	7.4	16.9	5.5	17.8	18.2	11.2				
Green Ext Time (p_c), s	0.0	7.2	0.0	3.7	0.0	10.8	0.0	1.9				
Intersection Summary												
HCM 2010 Ctrl Delay			43.4									
HCM 2010 LOS			D									

Timings
16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

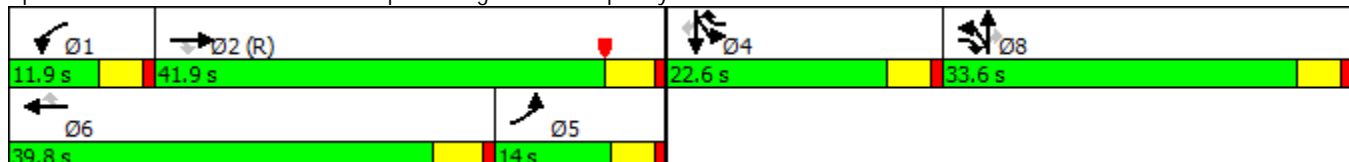


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	111	181	57	43	110	608	371	736	190	8	499	119
Future Volume (vph)	111	181	57	43	110	608	371	736	190	8	499	119
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	8	1	6	4	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	39.1	33.6	9.6	39.1	22.6	33.6	33.6	33.6	22.6	22.6	22.6
Total Split (s)	14.0	41.9	33.6	11.9	39.8	22.6	33.6	33.6	33.6	22.6	22.6	22.6
Total Split (%)	12.7%	38.1%	30.5%	10.8%	36.2%	20.5%	30.5%	30.5%	30.5%	20.5%	20.5%	20.5%
Yellow Time (s)	3.6	4.1	3.6	3.6	4.1	3.6	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	C-Max	Max	None	None	Max	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	29.1	40.0	70.4	6.0	15.0	33.5	29.0	29.0	29.0	18.0	18.0	18.0
Actuated g/C Ratio	0.26	0.36	0.64	0.05	0.14	0.30	0.26	0.26	0.26	0.16	0.16	0.16
v/c Ratio	0.25	0.14	0.05	0.25	0.56	0.66	0.76	0.83	0.33	0.03	0.86	0.28
Control Delay	37.6	24.9	1.3	53.0	13.9	20.0	49.8	47.1	9.2	39.1	60.8	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.6	24.9	1.3	53.0	13.9	20.0	49.8	47.1	9.2	39.1	60.8	4.2
LOS	D	C	A	D	B	C	D	D	A	D	E	A
Approach Delay		25.1			18.6			42.2			49.8	
Approach LOS		C			B			D			D	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:EBT, Start of Yellow
 Natural Cycle: 105
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 35.9
 Intersection LOS: D
 Intersection Capacity Utilization 84.7%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)

























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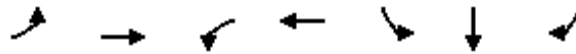
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	111	181	57	43	110	608	371	736	190	8	499	119
Future Volume (vph)	111	181	57	43	110	608	371	736	190	8	499	119
Ideal Flow (vphpl)	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lane Util. Factor	1.00	0.95	1.00	0.97	0.91	0.91	0.91	0.91	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	0.99	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.89	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600	1384	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600	1384	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	113	185	58	44	112	620	379	751	194	8	509	121
RTOR Reduction (vph)	0	0	22	0	270	47	0	0	120	0	0	101
Lane Group Flow (vph)	113	185	36	44	152	263	341	789	74	8	509	20
Confl. Peds. (#/hr)			2			1						
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	30.0	39.1	68.1	5.0	14.1	32.1	29.0	29.0	29.0	18.0	18.0	18.0
Effective Green, g (s)	30.0	39.1	68.1	5.0	14.1	32.1	29.0	29.0	29.0	18.0	18.0	18.0
Actuated g/C Ratio	0.27	0.36	0.62	0.05	0.13	0.29	0.26	0.26	0.26	0.16	0.16	0.16
Clearance Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	463	1279	1114	145	461	403	448	949	474	278	589	294
v/s Ratio Prot	c0.07	0.05	0.01	0.01	0.04	c0.11	0.20	c0.22		0.00	c0.14	
v/s Ratio Perm			0.01			0.08			0.04			0.01
v/c Ratio	0.24	0.14	0.03	0.30	0.33	0.65	0.76	0.83	0.16	0.03	0.86	0.07
Uniform Delay, d1	31.2	24.1	8.1	50.8	43.6	34.1	37.3	38.2	31.1	38.7	44.8	38.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.2	0.1	0.4	0.4	3.8	11.6	8.4	0.7	0.2	15.5	0.4
Delay (s)	31.3	24.3	8.2	51.2	44.1	37.9	48.9	46.6	31.8	38.8	60.3	39.3
Level of Service	C	C	A	D	D	D	D	D	C	D	E	D
Approach Delay (s)		23.9			42.0			45.0			56.1	
Approach LOS		C			D			D			E	

Intersection Summary		
HCM 2000 Control Delay	44.1	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.62	D
Actuated Cycle Length (s)	110.0	Sum of lost time (s)
Intersection Capacity Utilization	84.7%	18.9
Analysis Period (min)	15	ICU Level of Service
		E

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	181	57	43	110	608	371	736	190	8	499	119
Future Volume (veh/h)	111	181	57	43	110	608	371	736	190	8	499	119
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	113	185	41	44	112	608	377	754	154	8	509	103
Adj No. of Lanes	1	2	1	2	1	2	1	2	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	308	1256	957	102	371	1130	427	949	403	265	560	250
Arrive On Green	0.19	0.37	0.37	0.03	0.21	0.21	0.26	0.26	0.26	0.16	0.16	0.16
Sat Flow, veh/h	1619	3420	1508	3048	1800	3053	1619	3600	1530	1619	3420	1530
Grp Volume(v), veh/h	113	185	41	44	112	608	377	754	154	8	509	103
Grp Sat Flow(s),veh/h/ln	1619	1710	1508	1524	1800	1526	1619	1800	1530	1619	1710	1530
Q Serve(g_s), s	6.7	4.0	1.1	1.6	5.8	17.2	24.6	21.5	9.1	0.5	16.1	6.6
Cycle Q Clear(g_c), s	6.7	4.0	1.1	1.6	5.8	17.2	24.6	21.5	9.1	0.5	16.1	6.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	308	1256	957	102	371	1130	427	949	403	265	560	250
V/C Ratio(X)	0.37	0.15	0.04	0.43	0.30	0.54	0.88	0.79	0.38	0.03	0.91	0.41
Avail Cap(c_a), veh/h	308	1256	957	202	568	1464	427	949	403	265	560	250
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.8	23.3	7.7	52.1	37.0	27.3	38.9	37.7	33.2	38.7	45.2	41.2
Incr Delay (d2), s/veh	0.2	0.2	0.1	1.1	0.5	0.4	22.4	6.8	2.7	0.2	21.2	4.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	1.9	0.8	0.7	2.9	9.2	13.6	11.6	4.1	0.2	9.2	3.1
LnGrp Delay(d),s/veh	39.0	23.5	7.8	53.2	37.4	27.7	61.2	44.5	35.9	38.9	66.4	46.2
LnGrp LOS	D	C	A	D	D	C	E	D	D	D	E	D
Approach Vol, veh/h		339			764			1285			620	
Approach Delay, s/veh		26.8			30.6			48.4			62.7	
Approach LOS		C			C			D			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.3	45.5		22.6	26.0	27.8		33.6				
Change Period (Y+Rc), s	4.6	5.1		4.6	5.1	* 5.1		4.6				
Max Green Setting (Gmax), s	7.3	36.8		18.0	9.4	* 35		29.0				
Max Q Clear Time (g_c+I1), s	3.6	6.0		18.1	8.7	19.2		26.6				
Green Ext Time (p_c), s	0.0	1.4		0.0	0.1	2.9		1.5				
Intersection Summary												
HCM 2010 Ctrl Delay			44.4									
HCM 2010 LOS			D									
Notes												

Timings
1: I-215 SB Ramps & Auto Center Rd.

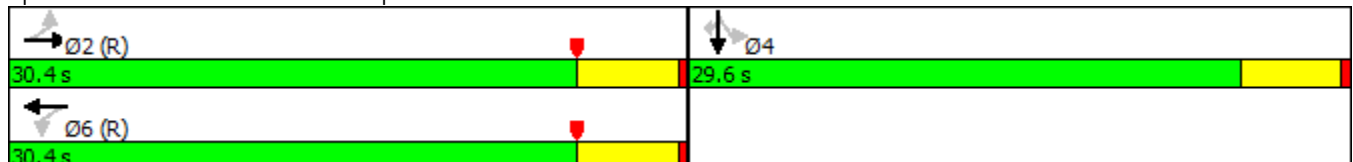


Lane Group	EBL	EBT	WBL	WBT	SBL	SBT	SBR
Lane Configurations		↑↑		↑↑	↘	↙	↗
Traffic Volume (vph)	6	466	8	426	608	104	276
Future Volume (vph)	6	466	8	426	608	104	276
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases		2		6		4	
Permitted Phases	2		6		4		4
Detector Phase	2	2	6	6	4	4	4
Switch Phase							
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	30.0	30.0	22.5	22.5	22.5	22.5	22.5
Total Split (s)	30.4	30.4	30.4	30.4	29.6	29.6	29.6
Total Split (%)	50.7%	50.7%	50.7%	50.7%	49.3%	49.3%	49.3%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	5.0	5.0	5.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max	Max
Act Effect Green (s)		25.4		25.4	24.6	24.6	24.6
Actuated g/C Ratio		0.42		0.42	0.41	0.41	0.41
v/c Ratio		0.43		0.30	0.53	0.51	0.32
Control Delay		10.9		6.3	16.7	16.2	3.1
Queue Delay		0.0		0.0	0.0	0.0	0.0
Total Delay		10.9		6.3	16.7	16.2	3.1
LOS		B		A	B	B	A
Approach Delay		10.9		6.3		12.7	
Approach LOS		B		A		B	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 50 (83%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.53
 Intersection Signal Delay: 10.8
 Intersection LOS: B
 Intersection Capacity Utilization 53.3%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 1: I-215 SB Ramps & Auto Center Rd.



HCM Signalized Intersection Capacity Analysis
 1: I-215 SB Ramps & Auto Center Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑					↖	↗	↘
Traffic Volume (vph)	6	466	179	8	426	0	0	0	0	608	104	276
Future Volume (vph)	6	466	179	8	426	0	0	0	0	608	104	276
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		5.0			5.0					5.0	5.0	5.0
Lane Util. Factor		0.95			0.95					0.95	0.95	1.00
Frbp, ped/bikes		0.99			1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00			1.00					1.00	1.00	1.00
Frt		0.96			1.00					1.00	1.00	0.85
Flt Protected		1.00			1.00					0.95	0.97	1.00
Satd. Flow (prot)		3600			3600					1700	1800	1800
Flt Permitted		0.95			0.94					0.95	0.97	1.00
Satd. Flow (perm)		3600			3600					1700	1800	1800
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	6	485	186	8	444	0	0	0	0	633	108	288
RTOR Reduction (vph)	0	66	0	0	0	0	0	0	0	0	0	165
Lane Group Flow (vph)	0	611	0	0	452	0	0	0	0	367	374	123
Confl. Peds. (#/hr)			1									
Confl. Bikes (#/hr)			1									
Turn Type	Perm	NA		Perm	NA					Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases	2			6						4		4
Actuated Green, G (s)		25.4			25.4					24.6	24.6	24.6
Effective Green, g (s)		25.4			25.4					24.6	24.6	24.6
Actuated g/C Ratio		0.42			0.42					0.41	0.41	0.41
Clearance Time (s)		5.0			5.0					5.0	5.0	5.0
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1524			1524					697	738	738
v/s Ratio Prot												
v/s Ratio Perm		0.17			0.13					0.22	0.21	0.07
v/c Ratio		0.40			0.30					0.53	0.51	0.17
Uniform Delay, d1		12.0			11.4					13.3	13.2	11.2
Progression Factor		1.00			0.52					1.00	1.00	1.00
Incremental Delay, d2		0.8			0.4					2.8	2.5	0.5
Delay (s)		12.8			6.3					16.2	15.7	11.7
Level of Service		B			A					B	B	B
Approach Delay (s)		12.8			6.3			0.0			14.7	
Approach LOS		B			A			A			B	


















Intersection Summary			
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
1: I-215 SB Ramps & Auto Center Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	466	179	8	426	0	0	0	0	608	104	276
Future Volume (veh/h)	6	466	179	8	426	0	0	0	0	608	104	276
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1800	1800	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	6	485	135	8	444	0				710	0	167
Adj No. of Lanes	0	2	0	0	2	0				2	0	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	64	1090	299	68	1407	0				1328	0	627
Arrive On Green	0.42	0.42	0.42	0.85	0.85	0.00				0.41	0.00	0.41
Sat Flow, veh/h	7	2575	706	15	3404	0				3238	0	1530
Grp Volume(v), veh/h	340	0	286	242	210	0				710	0	167
Grp Sat Flow(s),veh/h/ln	1794	0	1495	1782	1556	0				1619	0	1530
Q Serve(g_s), s	0.0	0.0	8.2	0.0	1.7	0.0				9.9	0.0	4.3
Cycle Q Clear(g_c), s	8.1	0.0	8.2	1.7	1.7	0.0				9.9	0.0	4.3
Prop In Lane	0.02		0.47	0.03		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	820	0	633	816	659	0				1328	0	627
V/C Ratio(X)	0.41	0.00	0.45	0.30	0.32	0.00				0.53	0.00	0.27
Avail Cap(c_a), veh/h	820	0	633	816	659	0				1328	0	627
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	12.3	0.0	12.3	2.8	2.8	0.0				13.4	0.0	11.7
Incr Delay (d2), s/veh	1.5	0.0	2.3	0.9	1.3	0.0				1.5	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	0.0	3.7	0.9	0.8	0.0				4.7	0.0	2.0
LnGrp Delay(d),s/veh	13.8	0.0	14.7	3.7	4.1	0.0				14.9	0.0	12.8
LnGrp LOS	B		B	A	A					B		B
Approach Vol, veh/h		626			452						877	
Approach Delay, s/veh		14.2			3.9						14.5	
Approach LOS		B			A						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		30.4		29.6		30.4						
Change Period (Y+Rc), s		5.0		5.0		5.0						
Max Green Setting (Gmax), s		25.4		24.6		25.4						
Max Q Clear Time (g_c+I1), s		10.2		11.9		3.7						
Green Ext Time (p_c), s		5.6		2.7		6.4						
Intersection Summary												
HCM 2010 Ctrl Delay			12.0									
HCM 2010 LOS			B									
Notes												

Timings

2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.

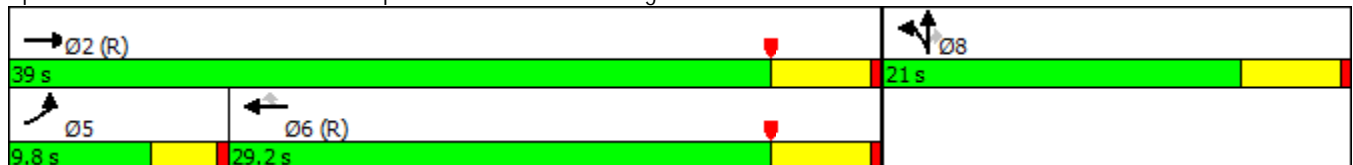


Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations	↶	↷↷	↷↷	↷	↶	↷	↷↷
Traffic Volume (vph)	230	840	1061	715	122	7	1071
Future Volume (vph)	230	840	1061	715	122	7	1071
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm
Protected Phases	5	2	6		8	8	
Permitted Phases				6			8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	8.0	8.0	8.0	5.0	5.0	5.0
Minimum Split (s)	8.5	39.0	13.0	13.0	10.0	10.0	10.0
Total Split (s)	9.8	39.0	29.2	29.2	21.0	21.0	21.0
Total Split (%)	16.3%	65.0%	48.7%	48.7%	35.0%	35.0%	35.0%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max
Act Effct Green (s)	6.3	34.0	24.2	24.2	16.0	16.0	16.0
Actuated g/C Ratio	0.10	0.57	0.40	0.40	0.27	0.27	0.27
v/c Ratio	1.32	0.42	0.75	0.63	0.15	0.14	0.95
Control Delay	201.5	5.2	19.2	5.3	17.9	17.7	35.5
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	12.0
Total Delay	201.5	5.4	19.2	5.3	17.9	17.7	47.5
LOS	F	A	B	A	B	B	D
Approach Delay		47.6	13.6			44.3	
Approach LOS		D	B			D	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 43 (72%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.32
 Intersection Signal Delay: 31.7
 Intersection LOS: C
 Intersection Capacity Utilization 76.8%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.



HCM Signalized Intersection Capacity Analysis

Gateway South Building 4 TIA (JN 10187)

2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.

3/27/2017

























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↗	↗↗			
Traffic Volume (vph)	230	840	0	0	1061	715	122	7	1071	0	0	0
Future Volume (vph)	230	840	0	0	1061	715	122	7	1071	0	0	0
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800	1700	1800	1800	1800	1800	1800
Total Lost time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	0.88			
Frbp, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.96	1.00			
Satd. Flow (prot)	1700	3600			3600	1800	1700	1800	3600			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.96	1.00			
Satd. Flow (perm)	1700	3600			3600	1800	1700	1800	3600			
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	235	857	0	0	1083	730	124	7	1093	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	436	0	0	191	0	0	0
Lane Group Flow (vph)	235	857	0	0	1083	294	66	65	902	0	0	0
Confl. Peds. (#/hr)			1									
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	6.3	34.0			24.2	24.2	16.0	16.0	16.0			
Effective Green, g (s)	6.3	34.0			24.2	24.2	16.0	16.0	16.0			
Actuated g/C Ratio	0.10	0.57			0.40	0.40	0.27	0.27	0.27			
Clearance Time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Vehicle Extension (s)	2.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	178	2040			1452	726	453	480	960			
v/s Ratio Prot	c0.14	0.24			c0.30		0.04	0.04				
v/s Ratio Perm						0.16			c0.25			
v/c Ratio	1.32	0.42			0.75	0.41	0.15	0.14	0.94			
Uniform Delay, d1	26.9	7.4			15.3	12.8	16.8	16.7	21.5			
Progression Factor	0.87	0.61			1.17	4.87	1.00	1.00	1.00			
Incremental Delay, d2	174.8	0.6			1.1	0.5	0.7	0.6	17.6			
Delay (s)	198.2	5.1			19.0	62.8	17.5	17.3	39.1			
Level of Service	F	A			B	E	B	B	D			
Approach Delay (s)		46.6			36.6			36.8			0.0	
Approach LOS		D			D			D			A	

Intersection Summary

HCM 2000 Control Delay	39.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 				 			
Traffic Volume (veh/h)	230	840	0	0	1061	715	122	7	1071	0	0	0
Future Volume (veh/h)	230	840	0	0	1061	715	122	7	1071	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1700	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	235	857	0	0	1083	526	129	0	759			
Adj No. of Lanes	1	2	0	0	2	1	2	0	2			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	170	1938	0	0	1379	617	863	0	816			
Arrive On Green	0.11	0.57	0.00	0.00	0.54	0.54	0.27	0.00	0.27			
Sat Flow, veh/h	1619	3510	0	0	3510	1530	3238	0	3060			
Grp Volume(v), veh/h	235	857	0	0	1083	526	129	0	759			
Grp Sat Flow(s),veh/h/ln	1619	1710	0	0	1710	1530	1619	0	1530			
Q Serve(g_s), s	6.3	8.7	0.0	0.0	15.2	17.6	1.8	0.0	14.5			
Cycle Q Clear(g_c), s	6.3	8.7	0.0	0.0	15.2	17.6	1.8	0.0	14.5			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	170	1938	0	0	1379	617	863	0	816			
V/C Ratio(X)	1.38	0.44	0.00	0.00	0.79	0.85	0.15	0.00	0.93			
Avail Cap(c_a), veh/h	170	1938	0	0	1379	617	863	0	816			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.10	0.10	1.00	0.00	1.00			
Uniform Delay (d), s/veh	26.9	7.5	0.0	0.0	11.8	12.4	16.8	0.0	21.5			
Incr Delay (d2), s/veh	204.3	0.7	0.0	0.0	0.5	1.7	0.4	0.0	18.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	12.4	4.2	0.0	0.0	7.1	7.5	0.9	0.0	8.2			
LnGrp Delay(d),s/veh	231.1	8.3	0.0	0.0	12.3	14.1	17.2	0.0	39.9			
LnGrp LOS	F	A			B	B	B		D			
Approach Vol, veh/h		1092			1609			888				
Approach Delay, s/veh		56.2			12.9			36.6				
Approach LOS		E			B			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		39.0			9.8	29.2		21.0				
Change Period (Y+Rc), s		5.0			3.5	5.0		5.0				
Max Green Setting (Gmax), s		34.0			6.3	24.2		16.0				
Max Q Clear Time (g_c+I1), s		10.7			8.3	19.6		16.5				
Green Ext Time (p_c), s		16.5			0.0	4.1		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				31.9								
HCM 2010 LOS				C								
Notes												

Timings
3: E St. & Orange Show Rd.

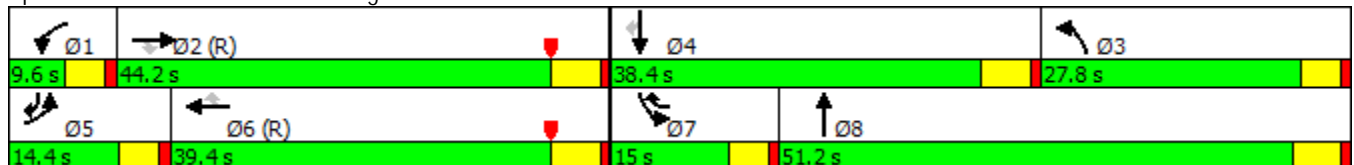


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↖↗	↑↑	↖	↖↗	↑↑	↖	↖	↑↔	↖↗	↑↑	↖
Traffic Volume (vph)	245	1253	362	157	1094	141	319	398	236	283	270
Future Volume (vph)	245	1253	362	157	1094	141	319	398	236	283	270
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8	7	4	5
Permitted Phases			2			6					4
Detector Phase	5	2	2	1	6	7	3	8	7	4	5
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0
Minimum Split (s)	9.6	39.4	39.4	9.6	39.4	9.6	9.6	38.4	9.6	38.4	9.6
Total Split (s)	14.4	44.2	44.2	9.6	39.4	15.0	27.8	51.2	15.0	38.4	14.4
Total Split (%)	12.0%	36.8%	36.8%	8.0%	32.8%	12.5%	23.2%	42.7%	12.5%	32.0%	12.0%
Yellow Time (s)	3.6	4.4	4.4	3.6	4.4	3.6	3.6	4.4	3.6	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4	4.6	5.4	4.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	Max	None	Max	None
Act Effct Green (s)	9.8	38.8	38.8	5.0	34.0	49.8	23.2	45.8	10.4	33.0	43.6
Actuated g/C Ratio	0.08	0.32	0.32	0.04	0.28	0.42	0.19	0.38	0.09	0.28	0.36
v/c Ratio	0.98	1.12	0.49	1.23	1.12	0.18	1.07	0.40	0.89	0.30	0.40
Control Delay	94.0	103.7	14.1	181.5	118.2	6.5	118.5	25.5	86.2	35.4	12.5
Queue Delay	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.0	103.9	14.3	181.5	118.2	6.5	118.5	25.5	86.2	35.4	12.5
LOS	F	F	B	F	F	A	F	C	F	D	B
Approach Delay		85.1			114.1			59.8		42.8	
Approach LOS		F			F			E		D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 108 (90%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.23
 Intersection Signal Delay: 82.1
 Intersection LOS: F
 Intersection Capacity Utilization 107.0%
 ICU Level of Service G
 Analysis Period (min) 15































Splits and Phases: 3: E St. & Orange Show Rd.



























HCM Signalized Intersection Capacity Analysis
3: E St. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 			 		 	 	
Traffic Volume (vph)	245	1253	362	157	1094	141	319	398	146	236	283	270
Future Volume (vph)	245	1253	362	157	1094	141	319	398	146	236	283	270
Ideal Flow (vphp)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Total Lost time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95		0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3200	3600	1800	3200	3600	1800	1600	3600		3200	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3200	3600	1800	3200	3600	1800	1600	3600		3200	3600	1800
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	255	1305	377	164	1140	147	332	415	152	246	295	281
RTOR Reduction (vph)	0	0	181	0	0	93	0	32	0	0	0	46
Lane Group Flow (vph)	255	1305	196	164	1140	54	332	535	0	246	295	235
Confl. Peds. (#/hr)									2			2
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	9.8	38.8	38.8	5.0	34.0	44.4	23.2	45.8		10.4	33.0	42.8
Effective Green, g (s)	9.8	38.8	38.8	5.0	34.0	44.4	23.2	45.8		10.4	33.0	42.8
Actuated g/C Ratio	0.08	0.32	0.32	0.04	0.28	0.37	0.19	0.38		0.09	0.28	0.36
Clearance Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	2.0	2.0	3.0		2.0	3.0	2.0
Lane Grp Cap (vph)	261	1164	582	133	1020	666	309	1374		277	990	642
v/s Ratio Prot	c0.08	c0.36		0.05	0.32	0.01	c0.21	c0.15		c0.08	0.08	0.03
v/s Ratio Perm			0.11			0.02						0.10
v/c Ratio	0.98	1.12	0.34	1.23	1.12	0.08	1.07	0.39		0.89	0.30	0.37
Uniform Delay, d1	55.0	40.6	30.8	57.5	43.0	24.6	48.4	26.9		54.2	34.4	28.6
Progression Factor	0.96	1.08	1.33	1.02	1.53	2.07	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	39.3	63.0	1.1	133.8	60.5	0.0	72.4	0.8		26.5	0.8	0.1
Delay (s)	92.3	107.0	42.1	192.4	126.2	50.8	120.8	27.8		80.7	35.1	28.7
Level of Service	F	F	D	F	F	D	F	C		F	D	C
Approach Delay (s)		92.4			126.1			62.1			46.6	
Approach LOS		F			F			E			D	
Intersection Summary												
HCM 2000 Control Delay			89.3	HCM 2000 Level of Service				F				
HCM 2000 Volume to Capacity ratio			0.93									
Actuated Cycle Length (s)			120.0	Sum of lost time (s)				20.0				
Intersection Capacity Utilization			107.0%	ICU Level of Service				G				
Analysis Period (min)			15									
c Critical Lane Group												

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	245	1253	362	157	1094	141	319	398	146	236	283	270
Future Volume (veh/h)	245	1253	362	157	1094	141	319	398	146	236	283	270
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	255	1305	201	164	1140	91	332	415	121	246	295	174
Adj No. of Lanes	2	2	1	2	2	1	1	2	0	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	241	1858	831	123	1721	903	295	1017	294	256	940	545
Arrive On Green	0.16	1.00	1.00	0.01	0.17	0.17	0.19	0.39	0.39	0.09	0.28	0.28
Sat Flow, veh/h	2956	3420	1530	2956	3420	1530	1524	2619	756	2956	3420	1527
Grp Volume(v), veh/h	255	1305	201	164	1140	91	332	270	266	246	295	174
Grp Sat Flow(s),veh/h/ln	1478	1710	1530	1478	1710	1530	1524	1710	1665	1478	1710	1527
Q Serve(g_s), s	9.8	0.0	0.0	5.0	37.5	5.0	23.2	13.7	14.0	9.9	8.2	8.5
Cycle Q Clear(g_c), s	9.8	0.0	0.0	5.0	37.5	5.0	23.2	13.7	14.0	9.9	8.2	8.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.45	1.00		1.00
Lane Grp Cap(c), veh/h	241	1858	831	123	1721	903	295	664	647	256	941	545
V/C Ratio(X)	1.06	0.70	0.24	1.33	0.66	0.10	1.13	0.41	0.41	0.96	0.31	0.32
Avail Cap(c_a), veh/h	241	1858	831	123	1721	903	295	664	647	256	941	545
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.63	0.63	0.63	0.43	0.43	0.43	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.2	0.0	0.0	59.2	40.5	18.7	48.4	26.6	26.7	54.6	34.5	24.2
Incr Delay (d2), s/veh	61.5	1.4	0.4	171.3	0.9	0.1	91.1	1.8	1.9	44.8	0.9	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.0	0.4	0.1	5.0	18.0	2.1	17.2	6.8	6.8	5.7	4.0	3.8
LnGrp Delay(d),s/veh	111.7	1.4	0.4	230.4	41.4	18.8	139.5	28.5	28.7	99.4	35.4	25.7
LnGrp LOS	F	A	A	F	D	B	F	C	C	F	D	C
Approach Vol, veh/h		1761			1395			868			715	
Approach Delay, s/veh		17.3			62.1			71.0			55.1	
Approach LOS		B			E			E			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.6	71.4	28.6	38.4	14.4	66.6	15.0	52.0				
Change Period (Y+Rc), s	4.6	5.4	5.4	* 5.4	4.6	5.4	4.6	5.4				
Max Green Setting (Gmax), s	5.0	38.8	23.2	* 33	9.8	34.0	10.4	45.8				
Max Q Clear Time (g_c+I1), s	7.0	2.0	25.2	10.5	11.8	39.5	11.9	16.0				
Green Ext Time (p_c), s	0.0	31.9	0.0	2.3	0.0	0.0	0.0	3.5				
Intersection Summary												
HCM 2010 Ctrl Delay			46.0									
HCM 2010 LOS			D									
Notes												

Timings
4: Arrowhead Av. & Orange Show Rd.

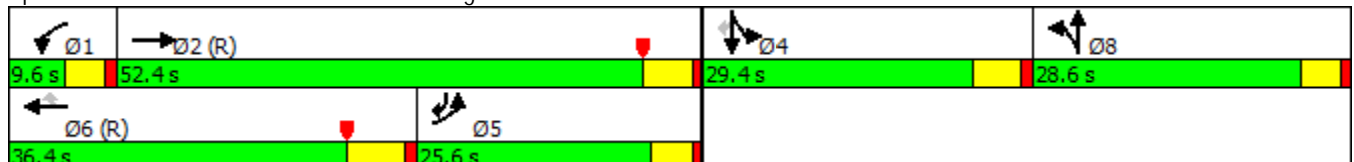


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖	↗	↖	↗	↗
Traffic Volume (vph)	300	1118	10	820	161	21	9	206	3	599
Future Volume (vph)	300	1118	10	820	161	21	9	206	3	599
Turn Type	Prot	NA	Prot	NA	Perm	Split	NA	Split	NA	pm+ov
Protected Phases	5	2	1	6		8	8	4	4	5
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	8	8	4	4	5
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	28.4	9.6	29.2	29.2	28.6	28.6	29.4	29.4	9.6
Total Split (s)	25.6	52.4	9.6	36.4	36.4	28.6	28.6	29.4	29.4	25.6
Total Split (%)	21.3%	43.7%	8.0%	30.3%	30.3%	23.8%	23.8%	24.5%	24.5%	21.3%
Yellow Time (s)	3.6	4.4	3.6	5.2	5.2	3.6	3.6	4.4	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	6.2	6.2	4.6	4.6	5.4	5.4	4.6
Lead/Lag	Lag	Lag	Lead	Lead	Lead					Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	C-Max	None	C-Max	C-Max	Max	Max	Max	Max	None
Act Effect Green (s)	21.0	54.7	5.0	30.2	30.2	24.0	24.0	24.0	24.0	50.4
Actuated g/C Ratio	0.18	0.46	0.04	0.25	0.25	0.20	0.20	0.20	0.20	0.42
v/c Ratio	1.09	0.74	0.16	0.97	0.30	0.07	0.13	0.33	0.31	0.63
Control Delay	77.9	14.0	60.7	68.9	7.8	39.7	16.3	44.4	43.8	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.9	14.0	60.7	68.9	7.8	39.7	16.3	44.4	43.8	10.1
LOS	E	B	E	E	A	D	B	D	D	B
Approach Delay		27.5		58.9			23.6		18.9	
Approach LOS		C		E			C		B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 111.2 (93%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.09
 Intersection Signal Delay: 34.8
 Intersection LOS: C
 Intersection Capacity Utilization 98.1%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 4: Arrowhead Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
4: Arrowhead Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)























3/28/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗	↖	↗		↖	↗	↗
Traffic Volume (vph)	300	1118	4	10	820	161	21	9	38	206	3	599
Future Volume (vph)	300	1118	4	10	820	161	21	9	38	206	3	599
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	6.2	6.2	4.6	4.6		5.4	5.4	4.6
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		0.95	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	0.97		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.88		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00
Satd. Flow (prot)	1700	3600		1700	3600	1800	1700	1800		1700	1800	1800
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00
Satd. Flow (perm)	1700	3600		1700	3600	1800	1700	1800		1700	1800	1800
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	323	1202	4	11	882	173	23	10	41	222	3	644
RTOR Reduction (vph)	0	0	0	0	0	128	0	33	0	0	0	274
Lane Group Flow (vph)	323	1206	0	11	882	45	23	18	0	113	112	370
Confl. Peds. (#/hr)									15			23
Confl. Bikes (#/hr)												1
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		8	8		4	4	5
Permitted Phases						6						4
Actuated Green, G (s)	24.7	51.0		1.0	26.5	26.5	24.0	24.0		24.0	24.0	48.7
Effective Green, g (s)	24.7	51.0		1.0	26.5	26.5	24.0	24.0		24.0	24.0	48.7
Actuated g/C Ratio	0.21	0.42		0.01	0.22	0.22	0.20	0.20		0.20	0.20	0.41
Clearance Time (s)	4.6	5.4		4.6	6.2	6.2	4.6	4.6		5.4	5.4	4.6
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	3.0	3.0		3.0	3.0	2.0
Lane Grp Cap (vph)	349	1530		14	795	397	340	360		340	360	799
v/s Ratio Prot	c0.19	0.34		0.01	c0.24		c0.01	0.01		0.07	0.06	c0.10
v/s Ratio Perm						0.03						0.11
v/c Ratio	0.93	0.79		0.79	1.11	0.11	0.07	0.05		0.33	0.31	0.46
Uniform Delay, d1	46.7	29.8		59.4	46.8	37.4	38.9	38.8		41.1	40.9	26.1
Progression Factor	0.63	0.49		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.4	0.4		123.8	66.3	0.6	0.4	0.3		2.6	2.2	0.2
Delay (s)	33.9	14.9		183.2	113.0	37.9	39.3	39.1		43.7	43.2	26.2
Level of Service	C	B		F	F	D	D	D		D	D	C
Approach Delay (s)		18.9			101.6			39.1			30.7	
Approach LOS		B			F			D			C	

Intersection Summary		
HCM 2000 Control Delay	47.1	HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio	0.67	
Actuated Cycle Length (s)	120.0	Sum of lost time (s) 20.8
Intersection Capacity Utilization	98.1%	ICU Level of Service F
Analysis Period (min)	15	

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	300	1118	4	10	820	161	21	9	38	206	3	599
Future Volume (veh/h)	300	1118	4	10	820	161	21	9	38	206	3	599
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	323	1202	4	11	882	121	23	10	26	224	0	575
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	443	1838	6	21	861	385	324	87	227	648	0	710
Arrive On Green	0.55	1.00	1.00	0.01	0.25	0.25	0.20	0.20	0.20	0.20	0.00	0.20
Sat Flow, veh/h	1619	3496	12	1619	3420	1530	1619	436	1133	3238	0	1458
Grp Volume(v), veh/h	323	588	618	11	882	121	23	0	36	224	0	575
Grp Sat Flow(s),veh/h/ln	1619	1710	1798	1619	1710	1530	1619	0	1569	1619	0	1458
Q Serve(g_s), s	18.0	0.0	0.0	0.8	30.2	7.7	1.4	0.0	2.3	7.1	0.0	5.6
Cycle Q Clear(g_c), s	18.0	0.0	0.0	0.8	30.2	7.7	1.4	0.0	2.3	7.1	0.0	5.6
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.72	1.00		1.00
Lane Grp Cap(c), veh/h	443	899	945	21	861	385	324	0	314	648	0	710
V/C Ratio(X)	0.73	0.65	0.65	0.53	1.02	0.31	0.07	0.00	0.11	0.35	0.00	0.81
Avail Cap(c_a), veh/h	443	899	945	67	861	385	324	0	314	648	0	710
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.8	0.0	0.0	58.9	44.9	36.5	39.0	0.0	39.3	41.3	0.0	26.7
Incr Delay (d2), s/veh	0.5	0.3	0.3	7.6	37.1	2.1	0.4	0.0	0.7	1.5	0.0	9.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.0	0.1	0.1	0.4	18.7	3.5	0.7	0.0	1.0	3.3	0.0	3.9
LnGrp Delay(d),s/veh	24.3	0.3	0.3	66.5	82.0	38.6	39.4	0.0	40.0	42.7	0.0	36.3
LnGrp LOS	C	A	A	E	F	D	D		D	D		D
Approach Vol, veh/h		1529			1014			59			799	
Approach Delay, s/veh		5.4			76.7			39.8			38.1	
Approach LOS		A			E			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.1	68.5		29.4	38.2	36.4		28.6				
Change Period (Y+Rc), s	4.6	5.4		5.4	5.4	* 6.2		4.6				
Max Green Setting (Gmax), s	5.0	47.0		24.0	21.0	* 30		24.0				
Max Q Clear Time (g_c+I1), s	2.8	2.0		9.1	20.0	32.2		4.3				
Green Ext Time (p_c), s	0.0	15.5		2.8	0.2	0.0		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay				34.9								
HCM 2010 LOS				C								
Notes												

Timings

5: Washington Av./Washington Av. & Orange Show Rd.

3/27/2017

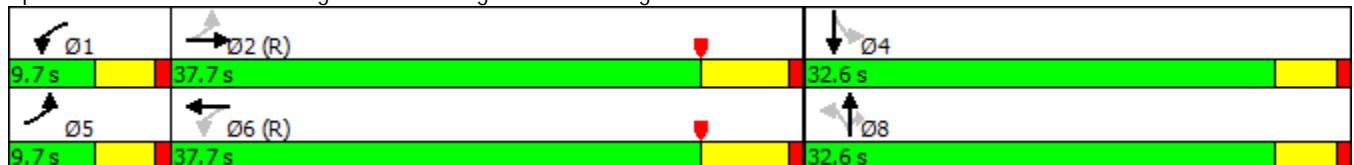


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↖	↗		↖	↗		↕
Traffic Volume (vph)	34	1350	4	950	28	4	5	11	2
Future Volume (vph)	34	1350	4	950	28	4	5	11	2
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	Perm	NA
Protected Phases	5	2	1	6		8			4
Permitted Phases	2		6		8		8	4	
Detector Phase	5	2	1	6	8	8	8	4	4
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	9.6	23.2	32.6	32.6	32.6	32.6	32.6
Total Split (s)	9.7	37.7	9.7	37.7	32.6	32.6	32.6	32.6	32.6
Total Split (%)	12.1%	47.1%	12.1%	47.1%	40.8%	40.8%	40.8%	40.8%	40.8%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6	4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None
Act Effect Green (s)	64.0	62.0	63.0	58.1		13.6	13.6		13.6
Actuated g/C Ratio	0.80	0.78	0.79	0.73		0.17	0.17		0.17
v/c Ratio	0.03	0.54	0.00	0.41		0.11	0.01		0.08
Control Delay	5.3	10.6	6.2	9.9		26.0	0.0		17.0
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Delay	5.3	10.6	6.2	9.9		26.0	0.0		17.0
LOS	A	B	A	A		C	A		B
Approach Delay		10.5		9.9		22.8			17.0
Approach LOS		B		A		C			B

Intersection Summary

Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.54
 Intersection Signal Delay: 10.5
 Intersection Capacity Utilization 69.5%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 5: Washington Av./Washington Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 5: Washington Av./Washington Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕		↖	↕			↕	↖		↕	↖
Traffic Volume (vph)	34	1350	17	4	950	15	28	4	5	11	2	11
Future Volume (vph)	34	1350	17	4	950	15	28	4	5	11	2	11
Ideal Flow (vphp)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2		4.6	6.2			4.6	4.6		4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85		0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.98	
Satd. Flow (prot)	1700	3600		1700	3600			1800	1800		1800	
Flt Permitted	0.23	1.00		0.13	1.00			0.74	1.00		0.87	
Satd. Flow (perm)	1700	3600		1700	3600			1800	1800		1800	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	37	1484	19	4	1044	16	31	4	5	12	2	12
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	4	0	11	0
Lane Group Flow (vph)	37	1502	0	4	1059	0	0	35	1	0	15	0
Confl. Bikes (#/hr)			1									1
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)	57.0	54.0		53.0	52.0			9.6	9.6		9.6	
Effective Green, g (s)	57.0	54.0		53.0	52.0			9.6	9.6		9.6	
Actuated g/C Ratio	0.71	0.68		0.66	0.65			0.12	0.12		0.12	
Clearance Time (s)	4.6	6.2		4.6	6.2			4.6	4.6		4.6	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	1211	2430		1126	2340			216	216		216	
v/s Ratio Prot	c0.00	c0.42		0.00	0.29							
v/s Ratio Perm	0.02			0.00				0.02	0.00		0.01	
v/c Ratio	0.03	0.62		0.00	0.45			0.16	0.00		0.07	
Uniform Delay, d1	3.8	7.3		5.5	6.9			31.6	31.0		31.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.0	1.2		0.0	0.6			0.4	0.0		0.1	
Delay (s)	3.8	8.4		5.5	7.6			31.9	31.0		31.4	
Level of Service	A	A		A	A			C	C		C	
Approach Delay (s)		8.3			7.6			31.8			31.4	
Approach LOS		A			A			C			C	




















Intersection Summary

HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.4
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary
 5: Washington Av./Washington Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	1350	17	4	950	15	28	4	5	11	2	11
Future Volume (veh/h)	34	1350	17	4	950	15	28	4	5	11	2	11
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	37	1484	19	4	1044	16	31	4	4	12	2	2
Adj No. of Lanes	1	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	426	2468	32	266	2359	36	199	21	135	156	26	15
Arrive On Green	0.04	0.71	0.71	0.01	0.68	0.68	0.09	0.09	0.09	0.09	0.09	0.09
Sat Flow, veh/h	1619	3457	44	1619	3448	53	1294	233	1530	872	290	166
Grp Volume(v), veh/h	37	734	769	4	518	542	35	0	4	16	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1791	1619	1710	1791	1527	0	1530	1328	0	0
Q Serve(g_s), s	0.5	17.2	17.2	0.1	11.0	11.0	0.0	0.0	0.2	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.5	17.2	17.2	0.1	11.0	11.0	1.5	0.0	0.2	1.5	0.0	0.0
Prop In Lane	1.00		0.02	1.00		0.03	0.89		1.00	0.75		0.12
Lane Grp Cap(c), veh/h	426	1221	1279	266	1170	1225	219	0	135	196	0	0
V/C Ratio(X)	0.09	0.60	0.60	0.02	0.44	0.44	0.16	0.00	0.03	0.08	0.00	0.00
Avail Cap(c_a), veh/h	473	1221	1279	360	1170	1225	604	0	535	583	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.09	0.09	0.09	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	4.0	5.7	5.7	5.3	5.7	5.7	33.9	0.0	33.3	33.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	2.2	2.1	0.0	0.1	0.1	0.3	0.0	0.1	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	8.7	9.1	0.0	5.1	5.3	0.7	0.0	0.1	0.3	0.0	0.0
LnGrp Delay(d),s/veh	4.1	7.9	7.8	5.3	5.8	5.8	34.3	0.0	33.4	33.8	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C		C	C		
Approach Vol, veh/h		1540			1064			39				16
Approach Delay, s/veh		7.8			5.8			34.2				33.8
Approach LOS		A			A			C				C
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.0	63.3		11.7	7.4	60.9		11.7				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.1	31.5		28.0	5.1	31.5		28.0				
Max Q Clear Time (g_c+I1), s	2.1	19.2		3.5	2.5	13.0		3.5				
Green Ext Time (p_c), s	0.0	11.3		0.2	0.0	16.5		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			7.5									
HCM 2010 LOS			A									

Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↔	
Traffic Vol, veh/h	0	0	0	0	0	32	0	0	0	22	0	0
Future Vol, veh/h	0	0	0	0	0	32	0	0	0	22	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	54	54	54	54	54	54	54	54	54	54	54	54
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	59	0	0	0	41	0	0

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	59	0	-	-	-	0	30	30	30
Stage 1	-	-	-	-	-	-	30	30	-
Stage 2	-	-	-	-	-	-	0	0	-
Critical Hdwy	4.1	-	-	-	-	-	6.4	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.4	5.5	-
Follow-up Hdwy	2.2	-	-	-	-	-	3.5	4	3.3
Pot Cap-1 Maneuver	1558	-	0	0	-	-	989	867	1050
Stage 1	-	-	0	0	-	-	998	874	-
Stage 2	-	-	0	0	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1558	-	-	-	-	-	989	0	1050
Mov Cap-2 Maneuver	-	-	-	-	-	-	989	0	-
Stage 1	-	-	-	-	-	-	998	0	-
Stage 2	-	-	-	-	-	-	-	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1558	-	-	-	989
HCM Lane V/C Ratio	-	-	-	-	0.041
HCM Control Delay (s)	0	-	-	-	8.8
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Timings

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.

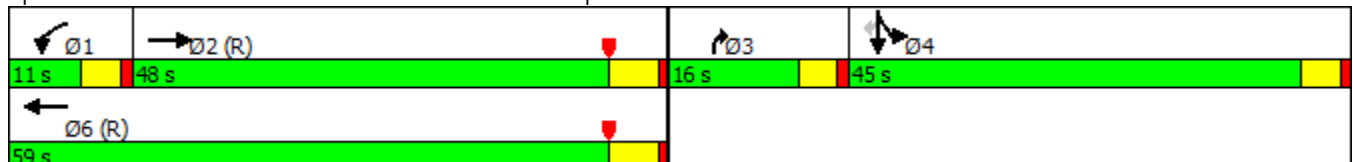


Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↖	↑↑	↗	↖	↗	↗
Traffic Volume (vph)	830	22	614	64	521	127	400
Future Volume (vph)	830	22	614	64	521	127	400
Turn Type	NA	Prot	NA	Prot	Split	NA	Perm
Protected Phases	2	1	6	3	4	4	
Permitted Phases							4
Detector Phase	2	1	6	3	4	4	4
Switch Phase							
Minimum Initial (s)	10.0	5.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	22.4	9.6	15.4	9.5	14.6	14.6	14.6
Total Split (s)	48.0	11.0	59.0	16.0	45.0	45.0	45.0
Total Split (%)	40.0%	9.2%	49.2%	13.3%	37.5%	37.5%	37.5%
Yellow Time (s)	4.4	3.6	4.4	3.5	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	4.6	5.4	4.5	4.6	4.6	4.6
Lead/Lag	Lag	Lead		Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes
Recall Mode	C-Max	None	C-Max	None	Max	Max	Max
Act Effect Green (s)	47.1	5.8	53.6	5.5	48.4	48.4	48.4
Actuated g/C Ratio	0.39	0.05	0.45	0.05	0.40	0.40	0.40
v/c Ratio	0.64	0.29	0.41	0.31	0.51	0.48	0.47
Control Delay	33.1	64.2	23.5	3.5	30.8	30.0	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.1	64.2	23.5	3.5	30.8	30.0	8.1
LOS	C	E	C	A	C	C	A
Approach Delay	33.1		24.9			21.9	
Approach LOS	C		C			C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 11 (9%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.64
 Intersection Signal Delay: 25.8
 Intersection LOS: C
 Intersection Capacity Utilization 59.8%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.






















HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑				↗	↖	↗	↗
Traffic Volume (vph)	0	830	18	22	614	0	0	0	64	521	127	400
Future Volume (vph)	0	830	18	22	614	0	0	0	64	521	127	400
Ideal Flow (vphp)	1800	1800	1800	1700	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Lane Util. Factor		0.95		1.00	0.95				1.00	0.95	0.95	1.00
Frbp, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00		1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00				1.00	0.95	0.97	1.00
Satd. Flow (prot)		3600		1700	3600				1800	1700	1800	1800
Flt Permitted		1.00		0.95	1.00				1.00	0.95	0.97	1.00
Satd. Flow (perm)		3600		1700	3600				1800	1700	1800	1800
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	892	19	24	660	0	0	0	69	560	137	430
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	66	0	0	199
Lane Group Flow (vph)	0	910	0	24	660	0	0	0	3	347	350	231
Confl. Peds. (#/hr)			3			1						
Turn Type		NA		Prot	NA				Prot	Split	NA	Perm
Protected Phases		2		1	6				3	4	4	
Permitted Phases												4
Actuated Green, G (s)		44.3		3.8	52.7				4.4	48.4	48.4	48.4
Effective Green, g (s)		44.3		3.8	52.7				4.4	48.4	48.4	48.4
Actuated g/C Ratio		0.37		0.03	0.44				0.04	0.40	0.40	0.40
Clearance Time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Vehicle Extension (s)		3.0		2.0	3.0				3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1329		53	1581				66	685	726	726
v/s Ratio Prot		c0.25		0.01	c0.18				c0.00	c0.20	0.19	
v/s Ratio Perm												0.13
v/c Ratio		0.68		0.45	0.42				0.04	0.51	0.48	0.32
Uniform Delay, d1		32.0		57.1	23.1				55.8	26.8	26.5	24.5
Progression Factor		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		2.9		2.2	0.8				0.2	2.7	2.3	1.2
Delay (s)		34.8		59.3	23.9				56.0	29.5	28.8	25.7
Level of Service		C		E	C				E	C	C	C
Approach Delay (s)		34.8			25.2			56.0			27.8	
Approach LOS		C			C			E			C	

Intersection Summary		
HCM 2000 Control Delay	30.2	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.57	C
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	59.8%	19.1
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		B

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	830	18	22	614	0	0	0	64	521	127	400
Future Volume (veh/h)	0	830	18	22	614	0	0	0	64	521	127	400
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	0	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	892	13	24	660	0	0	0	41	348	433	428
Adj No. of Lanes	0	2	0	1	2	0	0	0	1	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1790	26	37	1984	0	0	0	0	545	606	515
Arrive On Green	0.00	0.52	0.52	0.02	0.58	0.00	0.00	0.00	0.00	0.34	0.34	0.34
Sat Flow, veh/h	0	3541	50	1619	3510	0		0		1619	1800	1530
Grp Volume(v), veh/h	0	442	463	24	660	0		0.0		348	433	428
Grp Sat Flow(s),veh/h/ln	0	1710	1791	1619	1710	0				1619	1800	1530
Q Serve(g_s), s	0.0	20.1	20.1	1.8	12.1	0.0				21.8	25.2	30.9
Cycle Q Clear(g_c), s	0.0	20.1	20.1	1.8	12.1	0.0				21.8	25.2	30.9
Prop In Lane	0.00		0.03	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	887	929	37	1984	0				545	606	515
V/C Ratio(X)	0.00	0.50	0.50	0.65	0.33	0.00				0.64	0.71	0.83
Avail Cap(c_a), veh/h	0	887	929	86	1984	0				545	606	515
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.43	0.43	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	18.7	18.7	58.1	13.1	0.0				33.6	34.8	36.7
Incr Delay (d2), s/veh	0.0	2.0	1.9	3.0	0.2	0.0				5.6	7.0	14.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.9	10.4	0.8	5.7	0.0				10.6	13.7	15.1
LnGrp Delay(d),s/veh	0.0	20.7	20.7	61.1	13.3	0.0				39.3	41.8	51.1
LnGrp LOS		C	C	E	B					D	D	D
Approach Vol, veh/h		905			684						1209	
Approach Delay, s/veh		20.7			15.0						44.4	
Approach LOS		C			B						D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	7.4	67.6		45.0		75.0						
Change Period (Y+Rc), s	4.6	5.4		4.6		5.4						
Max Green Setting (Gmax), s	6.4	42.6		40.4		53.6						
Max Q Clear Time (g_c+I1), s	3.8	22.1		32.9		14.1						
Green Ext Time (p_c), s	0.0	10.0		3.2		13.0						
Intersection Summary												
HCM 2010 Ctrl Delay				29.5								
HCM 2010 LOS				C								
Notes												

Timings

9: Waterman Av. & Orange Show Rd./Orange Show Rd.

3/27/2017

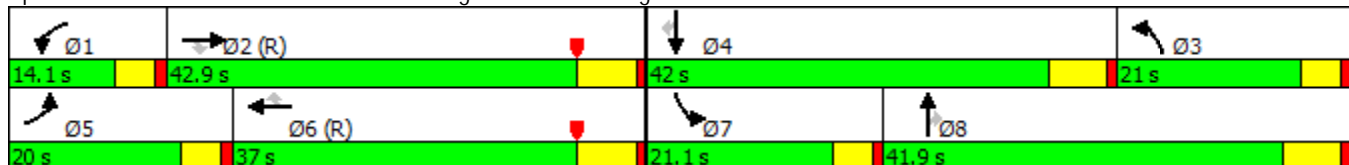


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↕	↘	↙	↕	↘	↙	↕	↘	↙	↕	↘
Traffic Volume (vph)	187	937	259	183	583	95	268	795	210	151	822	149
Future Volume (vph)	187	937	259	183	583	95	268	795	210	151	822	149
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.2	35.2	9.6	35.2	35.2	9.6	33.2	33.2	9.6	33.2	33.2
Total Split (s)	20.0	42.9	42.9	14.1	37.0	37.0	21.0	41.9	41.9	21.1	42.0	42.0
Total Split (%)	16.7%	35.8%	35.8%	11.8%	30.8%	30.8%	17.5%	34.9%	34.9%	17.6%	35.0%	35.0%
Yellow Time (s)	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Act Effect Green (s)	15.1	36.7	36.7	9.5	31.1	31.1	16.4	37.9	37.9	14.3	35.8	35.8
Actuated g/C Ratio	0.13	0.31	0.31	0.08	0.26	0.26	0.14	0.32	0.32	0.12	0.30	0.30
v/c Ratio	0.92	0.90	0.38	1.44	1.32	0.16	1.22	0.74	0.31	0.78	0.81	0.24
Control Delay	96.5	51.5	6.8	274.5	193.6	0.6	173.6	41.8	5.3	76.8	45.8	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	96.5	51.5	6.8	274.5	193.6	0.6	173.6	41.8	5.3	76.8	45.8	4.8
LOS	F	D	A	F	F	A	F	D	A	E	D	A
Approach Delay		49.2			189.5			63.5			44.5	
Approach LOS		D			F			E			D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.44
 Intersection Signal Delay: 78.1
 Intersection LOS: E
 Intersection Capacity Utilization 102.5%
 ICU Level of Service G
 Analysis Period (min) 15

Splits and Phases: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗↗	↖	↖	↗	↖	↖	↗↗	↖	↖	↗↗	↖
Traffic Volume (vph)	187	937	259	183	583	95	268	795	210	151	822	149
Future Volume (vph)	187	937	259	183	583	95	268	795	210	151	822	149
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	197	986	273	193	614	100	282	837	221	159	865	157
RTOR Reduction (vph)	0	0	174	0	0	74	0	0	151	0	0	110
Lane Group Flow (vph)	197	986	99	193	614	26	282	837	70	159	865	47
Confl. Peds. (#/hr)			1						1			
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	15.1	36.7	36.7	9.5	31.1	31.1	16.4	37.9	37.9	14.3	35.8	35.8
Effective Green, g (s)	15.1	36.7	36.7	9.5	31.1	31.1	16.4	37.9	37.9	14.3	35.8	35.8
Actuated g/C Ratio	0.13	0.31	0.31	0.08	0.26	0.26	0.14	0.32	0.32	0.12	0.30	0.30
Clearance Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	213	1101	550	134	466	466	232	1137	568	202	1074	537
v/s Ratio Prot	c0.12	0.27		c0.11	c0.34		c0.17	0.23		0.09	c0.24	
v/s Ratio Perm			0.06			0.01			0.04			0.03
v/c Ratio	0.92	0.90	0.18	1.44	1.32	0.06	1.22	0.74	0.12	0.79	0.81	0.09
Uniform Delay, d1	51.9	39.8	30.6	55.2	44.5	33.4	51.8	36.6	29.2	51.4	38.9	30.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	40.5	11.3	0.7	235.2	157.5	0.2	129.7	4.3	0.4	16.8	6.5	0.3
Delay (s)	92.4	51.1	31.3	290.4	201.9	33.6	181.5	40.9	29.7	68.2	45.3	30.6
Level of Service	F	D	C	F	F	C	F	D	C	E	D	C
Approach Delay (s)		53.0			202.2			68.6			46.5	
Approach LOS		D			F			E			D	

Intersection Summary

























HCM 2000 Control Delay	83.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	102.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	187	937	259	183	583	95	268	795	210	151	822	149
Future Volume (veh/h)	187	937	259	183	583	95	268	795	210	151	822	149
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	197	986	220	193	614	65	282	837	170	159	865	119
Adj No. of Lanes	1	2	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	208	2551	1127	128	1254	1066	221	1146	512	183	1020	456
Arrive On Green	0.13	0.75	0.75	0.08	0.70	0.70	0.14	0.34	0.34	0.11	0.30	0.30
Sat Flow, veh/h	1619	3420	1511	1619	1800	1530	1619	3420	1529	1619	3420	1530
Grp Volume(v), veh/h	197	986	220	193	614	65	282	837	170	159	865	119
Grp Sat Flow(s),veh/h/ln	1619	1710	1511	1619	1800	1530	1619	1710	1529	1619	1710	1530
Q Serve(g_s), s	14.5	12.4	9.6	9.5	18.8	1.6	16.4	25.9	10.0	11.6	28.5	9.5
Cycle Q Clear(g_c), s	14.5	12.4	9.6	9.5	18.8	1.6	16.4	25.9	10.0	11.6	28.5	9.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	208	2551	1127	128	1254	1066	221	1146	512	183	1020	456
V/C Ratio(X)	0.95	0.39	0.20	1.51	0.49	0.06	1.27	0.73	0.33	0.87	0.85	0.26
Avail Cap(c_a), veh/h	208	2551	1127	128	1254	1066	221	1146	512	223	1020	456
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.83	0.83	0.83	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.9	5.4	15.3	55.3	8.4	5.8	51.8	35.1	29.8	52.3	39.5	57.1
Incr Delay (d2), s/veh	42.2	0.4	0.3	263.7	1.4	0.1	153.8	4.1	1.7	22.3	8.7	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.9	5.9	4.1	13.6	9.7	0.7	16.8	12.9	4.4	6.3	14.7	4.2
LnGrp Delay(d),s/veh	94.1	5.8	15.7	318.9	9.7	5.9	205.6	39.2	31.6	74.6	48.3	58.5
LnGrp LOS	F	A	B	F	A	A	F	D	C	E	D	E
Approach Vol, veh/h		1403			872			1289			1143	
Approach Delay, s/veh		19.8			77.9			74.6			53.0	
Approach LOS		B			E			E			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.1	97.3	22.6	42.0	20.0	91.4	18.2	46.4				
Change Period (Y+Rc), s	4.6	6.2	6.2	* 6.2	4.6	6.2	4.6	6.2				
Max Green Setting (Gmax), s	9.5	36.7	16.4	* 36	15.4	30.8	16.5	35.7				
Max Q Clear Time (g_c+I1), s	11.5	14.4	18.4	30.5	16.5	20.8	13.6	27.9				
Green Ext Time (p_c), s	0.0	15.5	0.0	2.6	0.0	8.1	0.1	3.7				
Intersection Summary												
HCM 2010 Ctrl Delay			53.6									
HCM 2010 LOS			D									
Notes												

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↕	↕
Traffic Vol, veh/h	2	18	13	1270	1227	8
Future Vol, veh/h	2	18	13	1270	1227	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	75	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	2	20	14	1380	1334	9

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	2056	671	1342	0	0
Stage 1	1338	-	-	-	-
Stage 2	718	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	*49	*594	*891	-	-
Stage 1	*560	-	-	-	-
Stage 2	*524	-	-	-	-
Platoon blocked, %		1	1	-	-
Mov Cap-1 Maneuver	*48	*594	*891	-	-
Mov Cap-2 Maneuver	*267	-	-	-	-
Stage 1	*560	-	-	-	-
Stage 2	*516	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	* 891	-	267	594	-	-
HCM Lane V/C Ratio	0.016	-	0.008	0.033	-	-
HCM Control Delay (s)	9.1	-	18.6	11.3	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0	0.1	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Timings
11: Waterman Av. & Driveway 2/Park Center Dr.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↕		↕	↕	↕	↕↕	↕	↕	↕↕
Traffic Volume (vph)	8	0	106	0	36	8	1290	17	9	1431
Future Volume (vph)	8	0	106	0	36	8	1290	17	9	1431
Turn Type	Perm	NA	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4		8		5	2		1	6
Permitted Phases	4		8		8	2		2	6	
Detector Phase	4	4	8	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	21.6	21.6	21.6	9.6	23.2	23.2	9.6	33.2
Total Split (s)	21.6	21.6	21.6	21.6	21.6	9.6	33.8	33.8	9.6	33.8
Total Split (%)	33.2%	33.2%	33.2%	33.2%	33.2%	14.8%	52.0%	52.0%	14.8%	52.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		4.6	4.6	4.6	6.2	6.2	4.6	6.2
Lead/Lag						Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)		11.6		11.6	11.6	46.2	44.8	44.8	48.0	44.8
Actuated g/C Ratio		0.18		0.18	0.18	0.71	0.69	0.69	0.74	0.69
v/c Ratio		0.09		0.37	0.09	0.04	0.58	0.01	0.01	0.64
Control Delay		0.4		26.2	0.4	4.8	10.7	0.0	4.3	12.0
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		0.4		26.2	0.4	4.8	10.7	0.0	4.3	12.0
LOS		A		C	A	A	B	A	A	B
Approach Delay		0.4		19.7			10.5			11.9
Approach LOS		A		B			B			B

Intersection Summary

Cycle Length: 65
 Actuated Cycle Length: 65
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.64
 Intersection Signal Delay: 11.5
 Intersection Capacity Utilization 67.3%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 11: Waterman Av. & Driveway 2/Park Center Dr.



HCM Signalized Intersection Capacity Analysis
 11: Waterman Av. & Driveway 2/Park Center Dr.

Gateway South Building 4 TIA (JN 10187)

3/27/2017
























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↕	↕	↕	↕↕	
Traffic Volume (vph)	8	0	21	106	0	36	8	1290	17	9	1431	2
Future Volume (vph)	8	0	21	106	0	36	8	1290	17	9	1431	2
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)		4.6			4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes		1.00			1.00	0.99	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.90			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.99			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1603			1800	1800	1615	3600	1800	1700	3600	
Flt Permitted		0.90			0.74	1.00	0.10	1.00	1.00	0.13	1.00	
Satd. Flow (perm)		1467			1800	1800	174	3600	1800	1700	3600	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	9	0	23	118	0	40	9	1433	19	10	1590	2
RTOR Reduction (vph)	0	27	0	0	0	34	0	0	8	0	0	0
Lane Group Flow (vph)	0	5	0	0	118	6	9	1433	11	10	1592	0
Confl. Peds. (#/hr)						1			1			1
Confl. Bikes (#/hr)									1			1
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1		6
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		9.6			9.6	9.6	40.0	39.0	39.0	40.0	39.0	
Effective Green, g (s)		9.6			9.6	9.6	40.0	39.0	39.0	40.0	39.0	
Actuated g/C Ratio		0.15			0.15	0.15	0.62	0.60	0.60	0.62	0.60	
Clearance Time (s)		4.6			4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Vehicle Extension (s)		3.0			3.0	3.0	2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)		216			265	265	129	2160	1080	1166	2160	
v/s Ratio Prot							c0.00	0.40		0.00	c0.44	
v/s Ratio Perm		0.00			0.07	0.00	0.04		0.01	0.01		
v/c Ratio		0.02			0.45	0.02	0.07	0.66	0.01	0.01	0.74	
Uniform Delay, d1		23.7			25.3	23.7	7.0	8.6	5.2	6.1	9.3	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.0			1.2	0.0	0.1	1.6	0.0	0.0	2.3	
Delay (s)		23.7			26.5	23.7	7.1	10.3	5.3	6.1	11.6	
Level of Service		C			C	C	A	B	A	A	B	
Approach Delay (s)		23.7			25.8			10.2			11.6	
Approach LOS		C			C			B			B	

Intersection Summary

HCM 2000 Control Delay	11.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	15.4
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	0	21	106	0	36	8	1290	17	9	1431	2
Future Volume (veh/h)	8	0	21	106	0	36	8	1290	17	9	1431	2
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	9	0	11	118	0	27	9	1433	19	10	1590	2
Adj No. of Lanes	0	1	0	0	1	1	1	2	1	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	128	26	90	323	0	225	214	2063	903	243	2118	3
Arrive On Green	0.15	0.00	0.15	0.15	0.00	0.15	0.01	0.60	0.60	0.01	0.60	0.60
Sat Flow, veh/h	325	178	615	1443	0	1527	1619	3420	1497	1619	3505	4
Grp Volume(v), veh/h	20	0	0	118	0	27	9	1433	19	10	776	816
Grp Sat Flow(s),veh/h/ln	1118	0	0	1443	0	1527	1619	1710	1497	1619	1710	1799
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	1.0	0.1	18.6	0.3	0.2	21.3	21.4
Cycle Q Clear(g_c), s	4.9	0.0	0.0	4.9	0.0	1.0	0.1	18.6	0.3	0.2	21.3	21.4
Prop In Lane	0.45		0.55	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	245	0	0	323	0	225	214	2063	903	243	1034	1087
V/C Ratio(X)	0.08	0.00	0.00	0.37	0.00	0.12	0.04	0.69	0.02	0.04	0.75	0.75
Avail Cap(c_a), veh/h	413	0	0	486	0	399	320	2063	903	347	1034	1087
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.0	0.0	0.0	25.7	0.0	24.1	8.4	8.8	5.2	7.6	9.3	9.3
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.7	0.0	0.2	0.0	2.0	0.0	0.0	5.0	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	2.0	0.0	0.4	0.1	9.1	0.1	0.1	11.4	11.9
LnGrp Delay(d),s/veh	24.1	0.0	0.0	26.4	0.0	24.3	8.5	10.8	5.2	7.6	14.3	14.1
LnGrp LOS	C			C		C	A	B	A	A	B	B
Approach Vol, veh/h		20			145			1461			1602	
Approach Delay, s/veh		24.1			26.0			10.7			14.2	
Approach LOS		C			C			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.4	45.4		14.2	5.3	45.5		14.2				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.0	27.6		17.0	5.0	27.6		17.0				
Max Q Clear Time (g_c+I1), s	2.2	20.6		6.9	2.1	23.4		6.9				
Green Ext Time (p_c), s	0.0	6.8		0.5	0.0	4.2		0.5				
Intersection Summary												
HCM 2010 Ctrl Delay			13.2									
HCM 2010 LOS			B									

Timings
12: Waterman Av./Waterman Av. & Hospitality Ln.

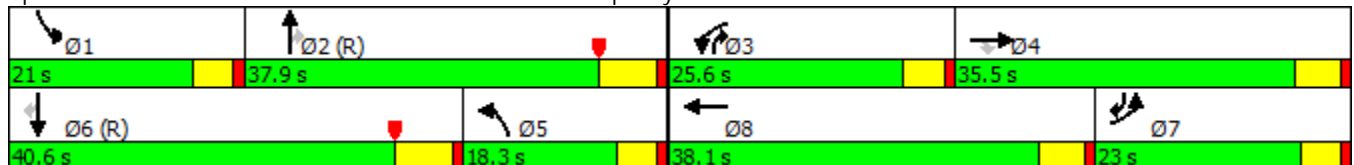


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗	↗	↗	↘	↗	↘
Traffic Volume (vph)	173	394	573	427	463	282	585	748	246	1157	153
Future Volume (vph)	173	394	573	427	463	282	585	748	246	1157	153
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8	5	2	3	1	6	7
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	3	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	15.1	15.1	9.6	38.1	9.6	36.2	9.6	9.6	36.2	9.6
Total Split (s)	23.0	35.5	35.5	25.6	38.1	18.3	37.9	25.6	21.0	40.6	23.0
Total Split (%)	19.2%	29.6%	29.6%	21.3%	31.8%	15.3%	31.6%	21.3%	17.5%	33.8%	19.2%
Yellow Time (s)	3.6	4.1	4.1	3.6	4.1	3.6	5.2	3.6	3.6	5.2	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	5.1	4.6	5.1	4.6	6.2	4.6	4.6	6.2	4.6
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effect Green (s)	20.2	27.2	27.2	19.9	26.8	13.7	31.7	57.8	20.7	38.7	65.2
Actuated g/C Ratio	0.17	0.23	0.23	0.17	0.22	0.11	0.26	0.48	0.17	0.32	0.54
v/c Ratio	0.64	0.78	0.56	0.86	0.78	0.82	0.65	0.43	0.89	0.71	0.16
Control Delay	57.8	42.7	16.3	65.2	48.8	70.8	43.1	15.7	81.6	39.2	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.8	42.7	16.3	65.2	48.8	70.8	43.1	15.7	81.6	39.2	5.5
LOS	E	D	B	E	D	E	D	B	F	D	A
Approach Delay		38.0			55.6		35.3			42.6	
Approach LOS		D			E		D			D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 22 (18%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 115
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.89
 Intersection Signal Delay: 41.9
 Intersection LOS: D
 Intersection Capacity Utilization 89.7%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 12: Waterman Av./Waterman Av. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
 12: Waterman Av./Waterman Av. & Hospitality Ln.
























Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↖	↖↗	↖↗		↖↗	↖↗	↖↗	↖	↖↗↘	↖
Traffic Volume (vph)	173	394	573	427	463	150	282	585	748	246	1157	153
Future Volume (vph)	173	394	573	427	463	150	282	585	748	246	1157	153
Ideal Flow (vphp)	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Lane Util. Factor	1.00	0.91	0.91	0.97	0.95		0.97	0.95	0.88	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.94	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Flt Permitted	1.00	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	184	419	610	454	493	160	300	622	796	262	1231	163
RTOR Reduction (vph)	0	88	172	0	28	0	0	0	108	0	0	59
Lane Group Flow (vph)	184	618	151	454	625	0	300	622	688	262	1231	104
Confl. Peds. (#/hr)						7			5			13
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4						2			6
Actuated Green, G (s)	20.3	27.2	27.2	19.9	26.8		13.7	31.7	51.6	20.7	38.7	59.0
Effective Green, g (s)	20.3	27.2	27.2	19.9	26.8		13.7	31.7	51.6	20.7	38.7	59.0
Actuated g/C Ratio	0.17	0.23	0.23	0.17	0.22		0.11	0.26	0.43	0.17	0.32	0.49
Clearance Time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	4.0	2.0	2.0	4.0	2.0
Lane Grp Cap (vph)	287	816	408	530	804		365	951	1548	293	1741	954
v/s Ratio Prot	0.11	c0.17		0.14	c0.17		c0.09	0.17	0.07	c0.15	c0.23	0.02
v/s Ratio Perm			0.08						0.12			0.04
v/c Ratio	0.64	0.76	0.37	0.86	0.78		0.82	0.65	0.44	0.89	0.71	0.11
Uniform Delay, d1	46.5	43.3	39.2	48.7	43.8		52.0	39.3	24.1	48.6	35.7	16.4
Progression Factor	1.00	1.00	1.00	1.02	1.03		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.6	4.0	0.6	11.7	4.5		13.2	3.5	0.1	26.7	2.4	0.0
Delay (s)	50.1	47.4	39.7	61.5	49.5		65.2	42.8	24.2	75.3	38.1	16.4
Level of Service	D	D	D	E	D		E	D	C	E	D	B
Approach Delay (s)		45.7			54.4			38.1			41.9	
Approach LOS		D			D			D			D	

Intersection Summary		
HCM 2000 Control Delay	44.0	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.79	D
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	89.7%	20.5
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		E

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	173	394	573	427	463	150	282	585	748	246	1157	153
Future Volume (veh/h)	173	394	573	427	463	150	282	585	748	246	1157	153
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	184	389	499	454	493	145	300	622	430	262	1231	93
Adj No. of Lanes	1	1	2	2	2	0	2	2	2	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	284	427	727	498	590	172	364	980	1219	221	1409	701
Arrive On Green	0.18	0.24	0.24	0.17	0.23	0.23	0.12	0.29	0.29	0.14	0.29	0.29
Sat Flow, veh/h	1619	1800	3060	2956	2606	762	2956	3420	2669	1619	4914	1509
Grp Volume(v), veh/h	184	389	499	454	322	316	300	622	430	262	1231	93
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	1710	1657	1478	1710	1335	1619	1638	1509
Q Serve(g_s), s	12.7	25.2	12.7	18.1	21.6	21.8	11.9	19.0	12.6	16.4	28.6	0.0
Cycle Q Clear(g_c), s	12.7	25.2	12.7	18.1	21.6	21.8	11.9	19.0	12.6	16.4	28.6	0.0
Prop In Lane	1.00		1.00	1.00		0.46	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	284	427	727	498	387	375	364	980	1219	221	1409	701
V/C Ratio(X)	0.65	0.91	0.69	0.91	0.83	0.84	0.82	0.63	0.35	1.18	0.87	0.13
Avail Cap(c_a), veh/h	284	456	775	517	470	456	364	980	1219	221	1409	701
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.83	0.83	0.83	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.0	44.5	21.3	49.0	44.2	44.3	51.3	37.3	21.2	51.8	40.7	18.5
Incr Delay (d2), s/veh	4.0	21.4	2.4	16.9	8.8	9.6	13.4	3.1	0.8	119.2	7.8	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.0	15.1	5.6	8.5	11.2	11.0	5.6	9.4	4.8	14.6	13.9	1.8
LnGrp Delay(d),s/veh	50.0	65.9	23.7	65.9	53.0	54.0	64.7	40.5	22.0	171.0	48.5	18.9
LnGrp LOS	D	E	C	E	D	D	E	D	C	F	D	B
Approach Vol, veh/h		1072			1092			1352			1586	
Approach Delay, s/veh		43.5			58.6			40.0			67.0	
Approach LOS		D			E			D			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	21.0	40.6	24.8	33.6	21.0	40.6	26.1	32.3				
Change Period (Y+Rc), s	4.6	6.2	4.6	5.1	6.2	* 6.2	5.1	* 5.1				
Max Green Setting (Gmax), s	16.4	31.7	21.0	30.4	13.7	* 34	18.4	* 33				
Max Q Clear Time (g_c+I1), s	18.4	21.0	20.1	27.2	13.9	30.6	14.7	23.8				
Green Ext Time (p_c), s	0.0	5.7	0.1	1.3	0.0	2.9	1.7	2.6				
Intersection Summary												
HCM 2010 Ctrl Delay			53.1									
HCM 2010 LOS			D									
Notes												

Intersection

Int Delay, s/veh 1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↖ ↗	↖ ↗	↖ ↗	
Traffic Vol, veh/h	0	0	406	1639	1522	721
Future Vol, veh/h	0	0	406	1639	1522	721
Conflicting Peds, #/hr	0	0	0	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	0	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	441	1782	1654	784

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	830	1657 0
Stage 1	-	-	- -
Stage 2	-	-	- -
Critical Hdwy	-	7.1	5.3 -
Critical Hdwy Stg 1	-	-	- -
Critical Hdwy Stg 2	-	-	- -
Follow-up Hdwy	-	3.9	3.1 -
Pot Cap-1 Maneuver	0	*572	*720 -
Stage 1	0	-	- -
Stage 2	0	-	- -
Platoon blocked, %	-	1	1 -
Mov Cap-1 Maneuver	-	*570	*720 -
Mov Cap-2 Maneuver	-	-	- -
Stage 1	-	-	- -
Stage 2	-	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	0	3.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	* 720	-	-	-	-
HCM Lane V/C Ratio	0.613	-	-	-	-
HCM Control Delay (s)	17.6	-	0	-	-
HCM Lane LOS	C	-	A	-	-
HCM 95th %tile Q(veh)	4.2	-	-	-	-

Notes

-: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations						↗		↕			↕	
Traffic Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Future Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	-	-	-	Free	-	-	-	-	-	None
Storage Length	-	-	-	-	-	0	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	1197	0	988	0	0	739	169

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	0	0	0
Stage 1	0	0	0
Stage 2	0	0	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBTWBLn1	SBT	SBR
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	-	0	-
HCM Lane LOS	-	A	-
HCM 95th %tile Q(veh)	-	-	-

Intersection

Int Delay, s/veh

Movement	NWL	NWR
Lane Configurations		
Traffic Vol, veh/h	0	0
Future Vol, veh/h	0	0
Conflicting Peds, #/hr	0	0
Sign Control	Stop	Stop
RT Channelized	-	-
Storage Length	-	-
Veh in Median Storage, #	0	-
Grade, %	0	-
Peak Hour Factor	96	96
Heavy Vehicles, %	0	0
Mvmt Flow	0	0

Major/Minor

Conflicting Flow All
Stage 1
Stage 2
Critical Hdwy
Critical Hdwy Stg 1
Critical Hdwy Stg 2
Follow-up Hdwy
Pot Cap-1 Maneuver
Stage 1
Stage 2
Platoon blocked, %
Mov Cap-1 Maneuver
Mov Cap-2 Maneuver
Stage 1
Stage 2

Approach

HCM Control Delay, s
 HCM LOS

Minor Lane/Major Mvmt

Timings

15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.

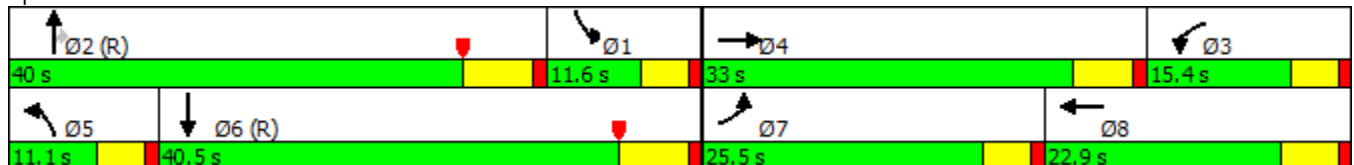


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖↗	↕	↖	↕	↖	↕↗	↗	↖	↕↗
Traffic Volume (vph)	644	692	175	369	56	989	86	217	633
Future Volume (vph)	644	692	175	369	56	989	86	217	633
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	9.6	31.4	9.6	15.4	9.6	36.2	36.2	9.6	36.2
Total Split (s)	25.5	33.0	15.4	22.9	11.1	40.0	40.0	11.6	40.5
Total Split (%)	25.5%	33.0%	15.4%	22.9%	11.1%	40.0%	40.0%	11.6%	40.5%
Yellow Time (s)	3.6	4.4	3.6	4.4	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	5.4	4.6	6.2	6.2	4.6	6.2
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)	20.9	27.1	11.3	17.5	6.2	33.8	33.8	7.0	36.5
Actuated g/C Ratio	0.21	0.27	0.11	0.18	0.06	0.34	0.34	0.07	0.36
v/c Ratio	1.03	0.91	0.97	0.87	0.57	0.87	0.12	1.94	0.67
Control Delay	81.4	48.9	105.5	48.1	67.1	39.9	0.3	480.1	28.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.4	48.9	105.5	48.1	67.1	39.9	0.3	480.1	28.7
LOS	F	D	F	D	E	D	A	F	C
Approach Delay		62.8		61.6		38.3			120.6
Approach LOS		E		E		D			F

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.94
 Intersection Signal Delay: 70.2
 Intersection LOS: E
 Intersection Capacity Utilization 99.1%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.



HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↕		↖	↕		↖	↕	↗	↖	↕	↕
Traffic Volume (vph)	644	692	166	175	369	203	56	989	86	217	633	217
Future Volume (vph)	644	692	166	175	369	203	56	989	86	217	633	217
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.95		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	685	736	177	186	393	216	60	1052	91	231	673	231
RTOR Reduction (vph)	0	21	0	0	74	0	0	0	61	0	33	0
Lane Group Flow (vph)	685	892	0	186	535	0	60	1052	30	231	871	0
Confl. Peds. (#/hr)			3						1			6
Confl. Bikes (#/hr)			1						1			
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	20.9	27.1		11.3	17.5		5.2	32.9	32.9	7.9	35.6	
Effective Green, g (s)	20.9	27.1		11.3	17.5		5.2	32.9	32.9	7.9	35.6	
Actuated g/C Ratio	0.21	0.27		0.11	0.18		0.05	0.33	0.33	0.08	0.36	
Clearance Time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	668	975		192	630		88	1184	592	134	1281	
v/s Ratio Prot	c0.21	0.25		0.11	c0.15		0.04	c0.29		c0.14	0.24	
v/s Ratio Perm									0.02			
v/c Ratio	1.03	0.91		0.97	0.85		0.68	0.89	0.05	1.72	0.68	
Uniform Delay, d1	39.5	35.3		44.2	40.0		46.6	31.8	22.9	46.0	27.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	41.5	12.7		55.0	10.4		15.9	10.1	0.2	355.1	2.9	
Delay (s)	81.0	48.1		99.1	50.3		62.5	41.9	23.1	401.1	30.3	
Level of Service	F	D		F	D		E	D	C	F	C	
Approach Delay (s)		62.2			61.7			41.5			105.8	
Approach LOS		E			E			D			F	

Intersection Summary		
HCM 2000 Control Delay	67.3	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.00	E
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	99.1%	20.8
Analysis Period (min)	15	ICU Level of Service
		F

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	644	692	166	175	369	203	56	989	86	217	633	217
Future Volume (veh/h)	644	692	166	175	369	203	56	989	86	217	633	217
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	685	736	170	186	393	175	60	1052	60	231	673	170
Adj No. of Lanes	2	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	618	759	175	175	423	186	75	1156	510	1307	3017	762
Arrive On Green	0.21	0.28	0.28	0.11	0.18	0.18	0.05	0.34	0.34	0.81	1.00	1.00
Sat Flow, veh/h	2956	2751	635	1619	2313	1017	1619	3420	1509	1619	2705	683
Grp Volume(v), veh/h	685	458	448	186	289	279	60	1052	60	231	425	418
Grp Sat Flow(s),veh/h/ln	1478	1710	1676	1619	1710	1621	1619	1710	1509	1619	1710	1678
Q Serve(g_s), s	20.9	26.4	26.5	10.8	16.6	17.0	3.7	29.4	2.7	3.2	0.0	0.0
Cycle Q Clear(g_c), s	20.9	26.4	26.5	10.8	16.6	17.0	3.7	29.4	2.7	3.2	0.0	0.0
Prop In Lane	1.00		0.38	1.00		0.63	1.00		1.00	1.00		0.41
Lane Grp Cap(c), veh/h	618	472	463	175	313	297	75	1156	510	1307	1907	1872
V/C Ratio(X)	1.11	0.97	0.97	1.06	0.92	0.94	0.81	0.91	0.12	0.18	0.22	0.22
Avail Cap(c_a), veh/h	618	472	463	175	313	297	105	1156	510	1307	1907	1872
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.78	0.78	0.78	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.5	35.8	35.8	44.6	40.2	40.3	47.3	31.6	22.8	2.2	0.0	0.0
Incr Delay (d2), s/veh	66.0	28.9	29.3	86.0	31.9	36.6	17.4	12.1	0.5	0.0	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.2	16.2	16.0	9.0	10.6	10.6	2.0	15.8	1.2	1.4	0.1	0.1
LnGrp Delay(d),s/veh	105.6	64.7	65.1	130.6	72.1	77.0	64.7	43.8	23.3	2.2	0.3	0.3
LnGrp LOS	F	E	E	F	E	E	E	D	C	A	A	A
Approach Vol, veh/h		1591			754			1172			1074	
Approach Delay, s/veh		82.4			88.3			43.8			0.7	
Approach LOS		F			F			D			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	87.8	40.0	16.2	33.0	9.2	118.6	25.5	23.7				
Change Period (Y+Rc), s	6.2	* 6.2	5.4	* 5.4	4.6	6.2	4.6	5.4				
Max Green Setting (Gmax), s	7.0	* 34	10.8	* 28	6.5	34.3	20.9	17.5				
Max Q Clear Time (g_c+I1), s	5.2	31.4	12.8	28.5	5.7	2.0	22.9	19.0				
Green Ext Time (p_c), s	0.2	1.7	0.0	0.0	0.0	7.9	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			54.4									
HCM 2010 LOS			D									
Notes												

Timings
16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

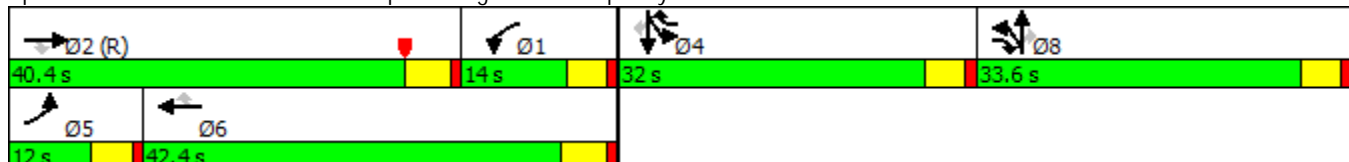


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	420	123	236	218	418	181	764	269	46	856	311
Future Volume (vph)	92	420	123	236	218	418	181	764	269	46	856	311
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	8	1	6	4	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	39.1	33.6	9.6	39.1	22.6	33.6	33.6	33.6	22.6	22.6	22.6
Total Split (s)	12.0	40.4	33.6	14.0	42.4	32.0	33.6	33.6	33.6	32.0	32.0	32.0
Total Split (%)	10.0%	33.7%	28.0%	11.7%	35.3%	26.7%	28.0%	28.0%	28.0%	26.7%	26.7%	26.7%
Yellow Time (s)	3.6	4.1	3.6	3.6	4.1	3.6	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lead	Lead		Lag	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	C-Max	Max	None	None	Max	Max	Max	Max	Max	Max	Max
Act Effect Green (s)	7.4	35.3	69.4	9.4	37.3	65.2	29.0	29.0	29.0	27.4	27.4	27.4
Actuated g/C Ratio	0.06	0.29	0.58	0.08	0.31	0.54	0.24	0.24	0.24	0.23	0.23	0.23
v/c Ratio	0.97	0.44	0.13	1.04	0.37	0.30	0.44	0.99	0.52	0.13	1.14	0.65
Control Delay	135.2	37.6	8.7	120.3	18.2	10.5	42.6	73.5	18.3	38.0	121.3	29.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	135.2	37.6	8.7	120.3	18.2	10.5	42.6	73.5	18.3	38.0	121.3	29.7
LOS	F	D	A	F	B	B	D	E	B	D	F	C
Approach Delay		46.1			44.0			57.1			94.7	
Approach LOS		D			D			E			F	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT, Start of Yellow
 Natural Cycle: 125
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.14
 Intersection Signal Delay: 64.0
 Intersection LOS: E
 Intersection Capacity Utilization 101.2%
 ICU Level of Service G
 Analysis Period (min) 15

Splits and Phases: 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)

3/30/2017



























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖↗	↖↗	↖	↖	↖↗	↖	↖	↗	↗
Traffic Volume (vph)	92	420	123	236	218	418	181	764	269	46	856	311
Future Volume (vph)	92	420	123	236	218	418	181	764	269	46	856	311
Ideal Flow (vphpl)	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lane Util. Factor	1.00	0.95	1.00	0.97	0.91	0.91	0.91	0.91	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	0.99	0.99	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600	1377	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600	1377	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	101	462	135	259	240	459	199	840	296	51	941	342
RTOR Reduction (vph)	0	0	28	0	144	26	0	0	139	0	0	115
Lane Group Flow (vph)	101	462	107	259	326	203	179	860	157	51	941	227
Confl. Peds. (#/hr)			4			7			2			
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	7.4	35.3	64.3	9.4	37.3	64.7	29.0	29.0	29.0	27.4	27.4	27.4
Effective Green, g (s)	7.4	35.3	64.3	9.4	37.3	64.7	29.0	29.0	29.0	27.4	27.4	27.4
Actuated g/C Ratio	0.06	0.29	0.54	0.08	0.31	0.54	0.24	0.24	0.24	0.23	0.23	0.23
Clearance Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	104	1059	1033	250	1119	742	410	870	435	388	822	411
v/s Ratio Prot	c0.06	c0.13	0.02	c0.08	0.09	0.06	0.11	c0.24		0.03	c0.26	
v/s Ratio Perm			0.03			0.09			0.09			0.13
v/c Ratio	0.97	0.44	0.10	1.04	0.29	0.27	0.44	0.99	0.36	0.13	1.14	0.55
Uniform Delay, d1	56.2	34.3	13.7	55.3	31.3	14.9	38.6	45.3	37.8	36.8	46.3	40.9
Progression Factor	1.14	1.06	1.32	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	70.0	1.1	0.2	66.6	0.1	0.2	3.4	27.9	2.3	0.7	79.4	5.3
Delay (s)	134.1	37.3	18.3	121.9	31.5	15.2	41.9	73.2	40.1	37.5	125.7	46.2
Level of Service	F	D	B	F	C	B	D	E	D	D	F	D
Approach Delay (s)		47.7			52.0			61.7			101.9	
Approach LOS		D			D			E			F	

Intersection Summary

HCM 2000 Control Delay	69.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.9
Intersection Capacity Utilization	101.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

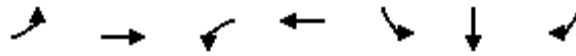
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	92	420	123	236	218	418	181	764	269	46	856	311
Future Volume (veh/h)	92	420	123	236	218	418	181	764	269	46	856	311
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	101	462	92	259	240	432	199	840	261	51	941	305
Adj No. of Lanes	1	2	1	2	1	2	1	2	1	1	2	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	100	1006	818	658	814	2044	391	870	369	370	781	349
Arrive On Green	0.02	0.10	0.10	0.22	0.45	0.45	0.24	0.24	0.24	0.23	0.23	0.23
Sat Flow, veh/h	1619	3420	1524	3048	1800	2973	1619	3600	1526	1619	3420	1530
Grp Volume(v), veh/h	101	462	92	259	240	432	199	840	261	51	941	305
Grp Sat Flow(s),veh/h/ln	1619	1710	1524	1524	1800	1487	1619	1800	1526	1619	1710	1530
Q Serve(g_s), s	7.4	15.3	4.4	8.7	10.1	6.5	12.8	27.7	18.8	3.0	27.4	23.1
Cycle Q Clear(g_c), s	7.4	15.3	4.4	8.7	10.1	6.5	12.8	27.7	18.8	3.0	27.4	23.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	100	1006	818	658	815	2044	391	870	369	370	781	349
V/C Ratio(X)	1.01	0.46	0.11	0.39	0.29	0.21	0.51	0.97	0.71	0.14	1.21	0.87
Avail Cap(c_a), veh/h	100	1006	818	658	814	2044	391	870	369	370	781	349
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.72	0.72	0.72	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.8	45.2	17.8	40.3	20.8	7.2	39.3	45.0	41.6	36.9	46.3	44.6
Incr Delay (d2), s/veh	79.7	1.1	0.2	0.1	0.2	0.1	4.7	23.2	10.9	0.8	104.2	24.7
Initial Q Delay(d3),s/veh	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	7.4	2.9	3.7	5.0	4.6	6.2	16.6	9.0	1.4	24.2	12.1
LnGrp Delay(d),s/veh	138.5	46.2	18.0	40.5	21.0	7.2	44.0	68.2	52.5	37.7	150.5	69.4
LnGrp LOS	F	D	B	D	C	A	D	E	D	D	F	E
Approach Vol, veh/h		655			931			1300			1297	
Approach Delay, s/veh		56.5			20.0			61.4			127.0	
Approach LOS		E			B			E			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	31.5	40.4		32.0	12.0	59.9		33.6				
Change Period (Y+Rc), s	5.1	* 5.1		4.6	4.6	5.1		4.6				
Max Green Setting (Gmax), s	9.4	* 35		27.4	7.4	37.3		29.0				
Max Q Clear Time (g_c+I1), s	10.7	17.3		29.4	9.4	12.1		29.7				
Green Ext Time (p_c), s	0.0	3.1		0.0	0.0	3.8		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			71.8									
HCM 2010 LOS			E									
Notes												

APPENDIX 7.2:

EAPC (2018) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Timings
1: I-215 SB Ramps & Auto Center Rd.

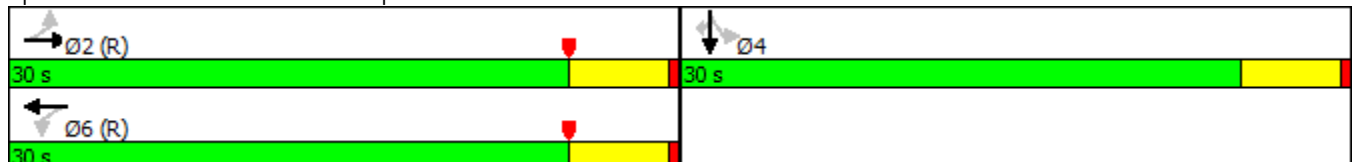


Lane Group	EBL	EBT	WBL	WBT	SBL	SBT	SBR
Lane Configurations		↑↑		↑↑	↘	↓	↙
Traffic Volume (vph)	24	146	1	229	1169	67	359
Future Volume (vph)	24	146	1	229	1169	67	359
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases		2		6		4	
Permitted Phases	2		6		4		4
Detector Phase	2	2	6	6	4	4	4
Switch Phase							
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	30.0	30.0	22.5	22.5	22.5	22.5	22.5
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	5.0	5.0	5.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max	Max
Act Effect Green (s)		25.0		25.0	25.0	25.0	25.0
Actuated g/C Ratio		0.42		0.42	0.42	0.42	0.42
v/c Ratio		0.14		0.16	0.93	0.87	0.39
Control Delay		9.3		11.3	40.4	31.9	2.8
Queue Delay		0.0		0.0	0.0	0.0	0.0
Total Delay		9.3		11.3	40.4	31.9	2.8
LOS		A		B	D	C	A
Approach Delay		9.3		11.3		28.7	
Approach LOS		A		B		C	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 2 (3%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 24.7
 Intersection Capacity Utilization 62.1%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service B

Splits and Phases: 1: I-215 SB Ramps & Auto Center Rd.



HCM Signalized Intersection Capacity Analysis
1: I-215 SB Ramps & Auto Center Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017




















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑					↘	↙	↗
Traffic Volume (vph)	24	146	34	1	229	0	0	0	0	1169	67	359
Future Volume (vph)	24	146	34	1	229	0	0	0	0	1169	67	359
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		5.0			5.0					5.0	5.0	5.0
Lane Util. Factor		0.95			0.95					0.95	0.95	1.00
Frt		0.98			1.00					1.00	1.00	0.85
Flt Protected		0.99			1.00					0.95	0.96	1.00
Satd. Flow (prot)		3600			3600					1700	1800	1800
Flt Permitted		0.91			0.95					0.95	0.96	1.00
Satd. Flow (perm)		3600			3600					1700	1800	1800
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	26	155	36	1	244	0	0	0	0	1244	71	382
RTOR Reduction (vph)	0	21	0	0	0	0	0	0	0	0	0	223
Lane Group Flow (vph)	0	196	0	0	245	0	0	0	0	659	656	159
Turn Type	Perm	NA		Perm	NA					Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases	2			6						4		4
Actuated Green, G (s)		25.0			25.0					25.0	25.0	25.0
Effective Green, g (s)		25.0			25.0					25.0	25.0	25.0
Actuated g/C Ratio		0.42			0.42					0.42	0.42	0.42
Clearance Time (s)		5.0			5.0					5.0	5.0	5.0
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1500			1500					708	750	750
v/s Ratio Prot												
v/s Ratio Perm		0.05			0.07					0.39	0.36	0.09
v/c Ratio		0.13			0.16					0.93	0.87	0.21
Uniform Delay, d1		10.8			11.0					16.7	16.1	11.2
Progression Factor		1.00			1.00					1.00	1.00	1.00
Incremental Delay, d2		0.2			0.2					20.6	13.5	0.6
Delay (s)		11.0			11.2					37.3	29.6	11.8
Level of Service		B			B					D	C	B
Approach Delay (s)		11.0			11.2			0.0			28.6	
Approach LOS		B			B			A			C	

Intersection Summary

HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	146	34	1	229	0	0	0	0	1169	67	359
Future Volume (veh/h)	24	146	34	1	229	0	0	0	0	1169	67	359
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1800	1800	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	26	155	29	1	244	0				1295	0	277
Adj No. of Lanes	0	2	0	0	2	0				2	0	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	191	1028	189	61	1397	0				1349	0	637
Arrive On Green	0.42	0.42	0.42	0.42	0.42	0.00				0.42	0.00	0.42
Sat Flow, veh/h	281	2467	453	2	3435	0				3238	0	1530
Grp Volume(v), veh/h	110	0	100	131	114	0				1295	0	277
Grp Sat Flow(s),veh/h/ln	1643	0	1558	1799	1556	0				1619	0	1530
Q Serve(g_s), s	0.0	0.0	2.4	0.0	2.8	0.0				23.3	0.0	7.7
Cycle Q Clear(g_c), s	2.3	0.0	2.4	2.8	2.8	0.0				23.3	0.0	7.7
Prop In Lane	0.24		0.29	0.01		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	759	0	649	810	648	0				1349	0	637
V/C Ratio(X)	0.15	0.00	0.15	0.16	0.18	0.00				0.96	0.00	0.43
Avail Cap(c_a), veh/h	759	0	649	810	648	0				1349	0	637
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	10.9	0.0	10.9	11.0	11.0	0.0				17.0	0.0	12.5
Incr Delay (d2), s/veh	0.4	0.0	0.5	0.4	0.6	0.0				16.6	0.0	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	1.1	1.4	1.3	0.0				13.4	0.0	3.6
LnGrp Delay(d),s/veh	11.3	0.0	11.4	11.4	11.6	0.0				33.6	0.0	14.6
LnGrp LOS	B		B	B	B					C		B
Approach Vol, veh/h		210			245						1572	
Approach Delay, s/veh		11.3			11.5						30.3	
Approach LOS		B			B						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		30.0		30.0		30.0						
Change Period (Y+Rc), s		5.0		5.0		5.0						
Max Green Setting (Gmax), s		25.0		25.0		25.0						
Max Q Clear Time (g_c+I1), s		4.4		25.3		4.8						
Green Ext Time (p_c), s		2.4		0.0		2.3						
Intersection Summary												
HCM 2010 Ctrl Delay			26.0									
HCM 2010 LOS			C									
Notes												

Timings

2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.

3/27/2017

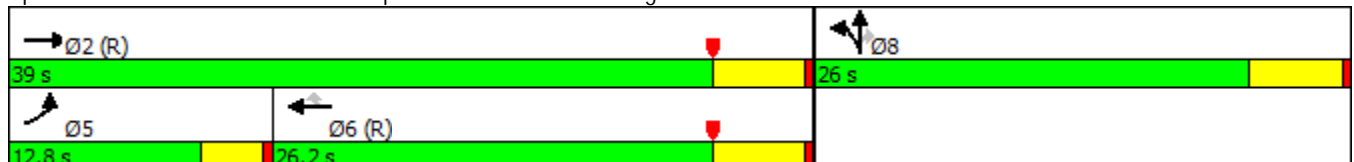


Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations	↶	↷↷	↷↷	↷	↶	↷	↷↷
Traffic Volume (vph)	83	1252	373	301	168	9	1117
Future Volume (vph)	83	1252	373	301	168	9	1117
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm
Protected Phases	5	2	6		8	8	
Permitted Phases				6			8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	8.0	8.0	8.0	5.0	5.0	5.0
Minimum Split (s)	8.5	39.0	13.0	13.0	10.0	10.0	10.0
Total Split (s)	12.8	39.0	26.2	26.2	26.0	26.0	26.0
Total Split (%)	19.7%	60.0%	40.3%	40.3%	40.0%	40.0%	40.0%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max
Act Effect Green (s)	7.6	34.0	24.6	24.6	21.0	21.0	21.0
Actuated g/C Ratio	0.12	0.52	0.38	0.38	0.32	0.32	0.32
v/c Ratio	0.46	0.73	0.30	0.37	0.18	0.17	1.00
Control Delay	34.1	14.9	16.1	3.6	16.9	16.8	48.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.1	14.9	16.1	3.6	16.9	16.8	48.8
LOS	C	B	B	A	B	B	D
Approach Delay		16.1	10.5			44.4	
Approach LOS		B	B			D	

Intersection Summary

Cycle Length: 65
 Actuated Cycle Length: 65
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.00
 Intersection Signal Delay: 26.0
 Intersection LOS: C
 Intersection Capacity Utilization 86.1%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.
























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↗	↗↗			
Traffic Volume (vph)	83	1252	0	0	373	301	168	9	1117	0	0	0
Future Volume (vph)	83	1252	0	0	373	301	168	9	1117	0	0	0
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800	1700	1800	1800	1800	1800	1800
Total Lost time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	0.88			
Frbp, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.96	1.00			
Satd. Flow (prot)	1700	3600			3600	1800	1700	1800	3600			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.96	1.00			
Satd. Flow (perm)	1700	3600			3600	1800	1700	1800	3600			
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	91	1376	0	0	410	331	185	10	1227	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	209	0	0	62	0	0	0
Lane Group Flow (vph)	91	1376	0	0	410	122	98	97	1165	0	0	0
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	6.6	34.0			23.9	23.9	21.0	21.0	21.0			
Effective Green, g (s)	6.6	34.0			23.9	23.9	21.0	21.0	21.0			
Actuated g/C Ratio	0.10	0.52			0.37	0.37	0.32	0.32	0.32			
Clearance Time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Vehicle Extension (s)	2.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	172	1883			1323	661	549	581	1163			
v/s Ratio Prot	0.05	c0.38			0.11		0.06	0.05				
v/s Ratio Perm						0.07			c0.32			
v/c Ratio	0.53	0.73			0.31	0.18	0.18	0.17	1.00			
Uniform Delay, d1	27.7	12.0			14.7	13.9	15.8	15.7	22.0			
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	1.4	2.5			0.6	0.6	0.7	0.6	26.7			
Delay (s)	29.1	14.5			15.3	14.6	16.5	16.4	48.7			
Level of Service	C	B			B	B	B	B	D			
Approach Delay (s)		15.4			15.0			44.3			0.0	
Approach LOS		B			B			D			A	

Intersection Summary			
HCM 2000 Control Delay	26.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	86.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	1252	0	0	373	301	168	9	1117	0	0	0
Future Volume (veh/h)	83	1252	0	0	373	301	168	9	1117	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1700	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	91	1376	0	0	410	249	192	0	1068			
Adj No. of Lanes	1	2	0	0	2	1	2	0	2			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	113	1789	0	0	1366	611	1046	0	989			
Arrive On Green	0.07	0.52	0.00	0.00	0.40	0.40	0.32	0.00	0.32			
Sat Flow, veh/h	1619	3510	0	0	3510	1530	3238	0	3060			
Grp Volume(v), veh/h	91	1376	0	0	410	249	192	0	1068			
Grp Sat Flow(s),veh/h/ln	1619	1710	0	0	1710	1530	1619	0	1530			
Q Serve(g_s), s	3.6	20.9	0.0	0.0	5.3	7.6	2.8	0.0	21.0			
Cycle Q Clear(g_c), s	3.6	20.9	0.0	0.0	5.3	7.6	2.8	0.0	21.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	113	1789	0	0	1366	611	1046	0	989			
V/C Ratio(X)	0.80	0.77	0.00	0.00	0.30	0.41	0.18	0.00	1.08			
Avail Cap(c_a), veh/h	232	1789	0	0	1366	611	1046	0	989			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.83	0.83	1.00	0.00	1.00			
Uniform Delay (d), s/veh	29.8	12.4	0.0	0.0	13.3	14.0	15.8	0.0	22.0			
Incr Delay (d2), s/veh	5.0	3.3	0.0	0.0	0.5	1.7	0.4	0.0	52.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.8	10.6	0.0	0.0	2.6	3.5	1.3	0.0	16.0			
LnGrp Delay(d),s/veh	34.8	15.6	0.0	0.0	13.8	15.7	16.2	0.0	74.9			
LnGrp LOS	C	B			B	B	B		F			
Approach Vol, veh/h		1467			659			1260				
Approach Delay, s/veh		16.8			14.5			65.9				
Approach LOS		B			B			E				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		39.0			8.0	31.0		26.0				
Change Period (Y+Rc), s		5.0			3.5	5.0		5.0				
Max Green Setting (Gmax), s		34.0			9.3	21.2		21.0				
Max Q Clear Time (g_c+I1), s		22.9			5.6	9.6		23.0				
Green Ext Time (p_c), s		8.4			0.0	8.7		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			34.6									
HCM 2010 LOS			C									
Notes												

Timings
3: E St. & Orange Show Rd.

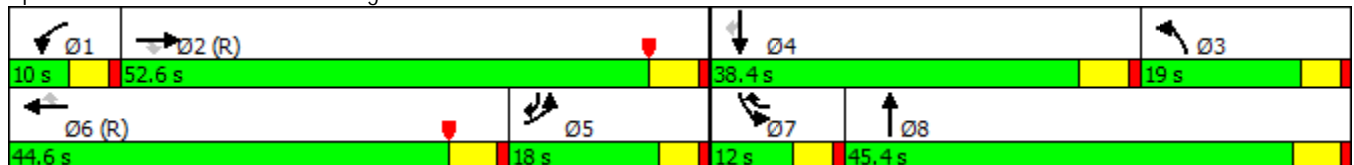


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑	↗	↔↔	↑↑	↗	↗	↑↑	↔↔	↑↑	↗
Traffic Volume (vph)	239	1552	495	63	444	69	171	182	54	136	51
Future Volume (vph)	239	1552	495	63	444	69	171	182	54	136	51
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8	7	4	5
Permitted Phases			2			6					4
Detector Phase	5	2	2	1	6	7	3	8	7	4	5
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0
Minimum Split (s)	9.6	39.4	39.4	9.6	39.4	9.6	9.6	38.4	9.6	38.4	9.6
Total Split (s)	18.0	52.6	52.6	10.0	44.6	12.0	19.0	45.4	12.0	38.4	18.0
Total Split (%)	15.0%	43.8%	43.8%	8.3%	37.2%	10.0%	15.8%	37.8%	10.0%	32.0%	15.0%
Yellow Time (s)	3.6	4.4	4.4	3.6	4.4	3.6	3.6	4.4	3.6	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4	4.6	5.4	4.6
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	Max	None	Max	None
Act Effect Green (s)	13.4	49.2	49.2	5.3	39.2	46.5	14.4	40.9	6.5	33.0	51.8
Actuated g/C Ratio	0.11	0.41	0.41	0.04	0.33	0.39	0.12	0.34	0.05	0.28	0.43
v/c Ratio	0.76	1.20	0.60	0.51	0.43	0.10	0.95	0.26	0.35	0.16	0.07
Control Delay	66.4	127.8	14.2	63.1	48.4	8.8	104.4	17.4	60.2	33.5	0.2
Queue Delay	0.0	0.4	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.4	128.2	14.7	63.1	48.4	8.8	104.4	17.4	60.2	33.5	0.2
LOS	E	F	B	E	D	A	F	B	E	C	A
Approach Delay		97.1			45.3			48.6		32.4	
Approach LOS		F			D			D		C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0.8 (1%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.20
 Intersection Signal Delay: 78.0
 Intersection LOS: E
 Intersection Capacity Utilization 97.8%
 ICU Level of Service F
 Analysis Period (min) 15































Splits and Phases: 3: E St. & Orange Show Rd.



























HCM Signalized Intersection Capacity Analysis
3: E St. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 			 		 	 	
Traffic Volume (vph)	239	1552	495	63	444	69	171	182	123	54	136	51
Future Volume (vph)	239	1552	495	63	444	69	171	182	123	54	136	51
Ideal Flow (vphp)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Total Lost time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95		0.97	0.95	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3200	3600	1800	3200	3600	1800	1700	3600		3200	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3200	3600	1800	3200	3600	1800	1700	3600		3200	3600	1800
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	272	1764	562	72	505	78	194	207	140	61	155	58
RTOR Reduction (vph)	0	0	197	0	0	49	0	92	0	0	0	35
Lane Group Flow (vph)	272	1764	366	72	505	29	194	255	0	61	155	23
Confl. Peds. (#/hr)									2			
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	14.3	48.3	48.3	4.3	38.3	44.8	14.4	40.9		6.5	33.0	47.3
Effective Green, g (s)	14.3	48.3	48.3	4.3	38.3	44.8	14.4	40.9		6.5	33.0	47.3
Actuated g/C Ratio	0.12	0.40	0.40	0.04	0.32	0.37	0.12	0.34		0.05	0.28	0.39
Clearance Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	2.0	2.0	3.0		2.0	3.0	2.0
Lane Grp Cap (vph)	381	1449	724	114	1149	672	204	1227		173	990	778
v/s Ratio Prot	0.09	c0.49		0.02	c0.14	0.00	c0.11	c0.07		c0.02	0.04	0.00
v/s Ratio Perm			0.20			0.01						0.01
v/c Ratio	0.71	1.22	0.51	0.63	0.44	0.04	0.95	0.21		0.35	0.16	0.03
Uniform Delay, d1	50.9	35.9	26.9	57.1	32.4	24.0	52.4	28.1		54.7	33.0	22.3
Progression Factor	1.00	1.00	1.00	0.92	1.49	13.09	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.2	104.3	2.5	7.3	1.1	0.0	48.6	0.4		0.5	0.3	0.0
Delay (s)	56.1	140.2	29.4	59.9	49.2	313.4	101.1	28.4		55.2	33.3	22.3
Level of Service	E	F	C	E	D	F	F	C		E	C	C
Approach Delay (s)		107.4			81.8			54.5			35.8	
Approach LOS		F			F			D			D	
Intersection Summary												
HCM 2000 Control Delay			91.4									F
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			120.0						20.0			
Intersection Capacity Utilization			97.8%									F
ICU Level of Service												
Analysis Period (min)			15									
c Critical Lane Group												

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	239	1552	495	63	444	69	171	182	123	54	136	51
Future Volume (veh/h)	239	1552	495	63	444	69	171	182	123	54	136	51
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	272	1764	311	72	505	47	194	207	108	61	155	36
Adj No. of Lanes	2	2	1	2	2	1	1	2	0	2	2	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	611	1717	768	112	1117	555	183	806	404	107	940	737
Arrive On Green	0.21	0.50	0.50	0.01	0.11	0.11	0.12	0.37	0.37	0.04	0.28	0.28
Sat Flow, veh/h	2956	3420	1530	2956	3420	1530	1524	2206	1106	2956	3420	1530
Grp Volume(v), veh/h	272	1764	311	72	505	47	194	159	156	61	155	36
Grp Sat Flow(s),veh/h/ln	1478	1710	1530	1478	1710	1530	1524	1710	1603	1478	1710	1530
Q Serve(g_s), s	9.6	60.3	12.1	2.9	16.6	2.0	14.4	7.8	8.2	2.4	4.1	0.0
Cycle Q Clear(g_c), s	9.6	60.3	12.1	2.9	16.6	2.0	14.4	7.8	8.2	2.4	4.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.69	1.00		1.00
Lane Grp Cap(c), veh/h	611	1717	768	112	1117	555	183	625	586	107	941	737
V/C Ratio(X)	0.45	1.03	0.40	0.64	0.45	0.08	1.06	0.25	0.27	0.57	0.16	0.05
Avail Cap(c_a), veh/h	611	1717	768	133	1117	555	183	625	586	182	941	737
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.40	0.40	0.40	0.88	0.88	0.88	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.6	29.9	11.8	58.4	43.5	19.2	52.8	26.6	26.8	56.9	33.0	16.5
Incr Delay (d2), s/veh	0.1	21.3	0.6	3.9	1.2	0.3	83.6	1.0	1.1	1.8	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	33.5	5.2	1.3	8.1	0.9	10.3	3.8	3.8	1.0	2.0	0.7
LnGrp Delay(d),s/veh	41.7	51.1	12.5	62.3	44.6	19.5	136.4	27.6	27.9	58.7	33.4	16.6
LnGrp LOS	D	F	B	E	D	B	F	C	C	E	C	B
Approach Vol, veh/h		2347			624			509			252	
Approach Delay, s/veh		44.9			44.8			69.2			37.1	
Approach LOS		D			D			E			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.1	65.8	19.8	38.4	30.3	44.6	8.9	49.3				
Change Period (Y+Rc), s	4.6	5.4	5.4	* 5.4	5.4	* 5.4	4.6	5.4				
Max Green Setting (Gmax), s	5.4	47.2	14.4	* 33	13.4	* 39	7.4	40.0				
Max Q Clear Time (g_c+I1), s	4.9	62.3	16.4	6.1	11.6	18.6	4.4	10.2				
Green Ext Time (p_c), s	0.0	0.0	0.0	1.0	0.3	4.5	0.0	1.9				
Intersection Summary												
HCM 2010 Ctrl Delay			47.7									
HCM 2010 LOS			D									
Notes												

Timings
4: Arrowhead Av. & Orange Show Rd.

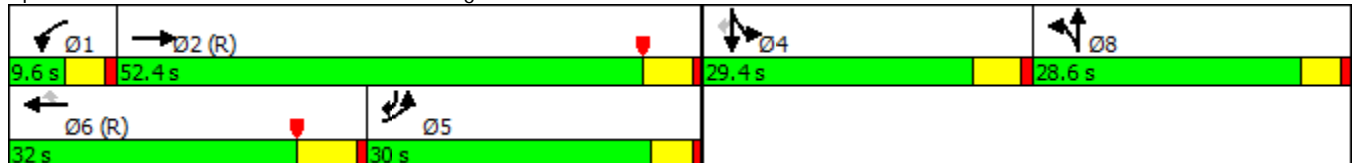


Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	408	1257	7	394	105	3	115	11	231
Future Volume (vph)	408	1257	7	394	105	3	115	11	231
Turn Type	Prot	NA	Prot	NA	Perm	NA	Split	NA	pm+ov
Protected Phases	5	2	1	6		8	4	4	5
Permitted Phases					6				4
Detector Phase	5	2	1	6	6	8	4	4	5
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	28.4	9.6	29.2	29.2	28.6	29.4	29.4	9.6
Total Split (s)	30.0	52.4	9.6	32.0	32.0	28.6	29.4	29.4	30.0
Total Split (%)	25.0%	43.7%	8.0%	26.7%	26.7%	23.8%	24.5%	24.5%	25.0%
Yellow Time (s)	3.6	4.4	3.6	5.2	5.2	3.6	4.4	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	6.2	6.2	4.6	5.4	5.4	4.6
Lead/Lag	Lag	Lag	Lead	Lead	Lead				Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				Yes
Recall Mode	None	C-Max	None	C-Max	C-Max	Max	Max	Max	None
Act Effect Green (s)	25.4	54.7	5.0	25.8	25.8	24.0	24.0	24.0	54.8
Actuated g/C Ratio	0.21	0.46	0.04	0.22	0.22	0.20	0.20	0.20	0.46
v/c Ratio	1.29	0.88	0.11	0.58	0.25	0.02	0.21	0.20	0.27
Control Delay	173.2	31.2	59.0	45.7	8.2	26.6	42.1	41.8	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	173.2	31.2	59.0	45.7	8.2	26.6	42.1	41.8	3.0
LOS	F	C	E	D	A	C	D	D	A
Approach Delay		65.6		38.1		26.6		16.8	
Approach LOS		E		D		C		B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 34 (28%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.29
 Intersection Signal Delay: 53.2
 Intersection LOS: D
 Intersection Capacity Utilization 74.3%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 4: Arrowhead Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
4: Arrowhead Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/28/2017



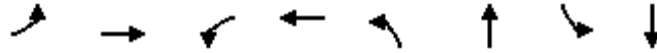
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	408	1257	18	7	394	105	0	3	5	115	11	231
Future Volume (vph)	408	1257	18	7	394	105	0	3	5	115	11	231
Ideal Flow (vphp)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	6.2	6.2		4.6		5.4	5.4	4.6
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00		0.99		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00		0.95	0.96	1.00
Satd. Flow (prot)	1700	3600		1700	3600	1800		1800		1700	1800	1800
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00		0.95	0.96	1.00
Satd. Flow (perm)	1700	3600		1700	3600	1800		1800		1700	1800	1800
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	464	1428	20	8	448	119	0	3	6	131	12	262
RTOR Reduction (vph)	0	1	0	0	0	97	0	5	0	0	0	147
Lane Group Flow (vph)	464	1447	0	8	448	22	0	4	0	72	72	116
Confl. Peds. (#/hr)									6			7
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		8	8		4	4	5
Permitted Phases						6						4
Actuated Green, G (s)	29.1	51.0		1.0	22.1	22.1		24.0		24.0	24.0	53.1
Effective Green, g (s)	29.1	51.0		1.0	22.1	22.1		24.0		24.0	24.0	53.1
Actuated g/C Ratio	0.24	0.42		0.01	0.18	0.18		0.20		0.20	0.20	0.44
Clearance Time (s)	4.6	5.4		4.6	6.2	6.2		4.6		5.4	5.4	4.6
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0		3.0		3.0	3.0	2.0
Lane Grp Cap (vph)	412	1530		14	663	331		360		340	360	865
v/s Ratio Prot	c0.27	c0.40		0.00	c0.12			c0.00		c0.04	0.04	0.03
v/s Ratio Perm						0.01						0.03
v/c Ratio	1.13	0.95		0.57	0.68	0.07		0.01		0.21	0.20	0.13
Uniform Delay, d1	45.5	33.2		59.3	45.6	40.4		38.5		40.1	40.0	19.8
Progression Factor	1.03	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	60.1	1.7		30.5	5.5	0.4		0.1		1.4	1.2	0.0
Delay (s)	106.8	34.8		89.8	51.1	40.8		38.5		41.5	41.2	19.9
Level of Service	F	C		F	D	D		D		D	D	B
Approach Delay (s)		52.3			49.5			38.5			27.5	
Approach LOS		D			D			D			C	

Intersection Summary		
HCM 2000 Control Delay	48.2	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.60	D
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	74.3%	20.8
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	408	1257	18	7	394	105	0	3	5	115	11	231
Future Volume (veh/h)	408	1257	18	7	394	105	0	3	5	115	11	231
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	464	1428	19	8	448	99	0	3	6	140	0	168
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	699	2247	30	16	735	329	324	107	213	648	0	963
Arrive On Green	0.14	0.21	0.21	0.01	0.22	0.22	0.00	0.20	0.20	0.20	0.00	0.20
Sat Flow, veh/h	1619	3456	46	1619	3420	1530	1619	533	1067	3238	0	1514
Grp Volume(v), veh/h	464	706	741	8	448	99	0	0	9	140	0	168
Grp Sat Flow(s),veh/h/ln	1619	1710	1792	1619	1710	1530	1619	0	1600	1619	0	1514
Q Serve(g_s), s	32.6	45.1	45.1	0.6	14.2	6.5	0.0	0.0	0.5	4.3	0.0	0.0
Cycle Q Clear(g_c), s	32.6	45.1	45.1	0.6	14.2	6.5	0.0	0.0	0.5	4.3	0.0	0.0
Prop In Lane	1.00		0.03	1.00		1.00	1.00		0.67	1.00		1.00
Lane Grp Cap(c), veh/h	699	1112	1165	16	735	329	324	0	320	648	0	963
V/C Ratio(X)	0.66	0.64	0.64	0.51	0.61	0.30	0.00	0.00	0.03	0.22	0.00	0.17
Avail Cap(c_a), veh/h	699	1112	1165	67	735	329	324	0	320	648	0	963
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.09	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	43.2	34.2	34.2	59.1	42.5	39.5	0.0	0.0	38.6	40.1	0.0	9.1
Incr Delay (d2), s/veh	0.2	0.3	0.2	9.0	3.7	2.3	0.0	0.0	0.2	0.8	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.7	21.4	22.5	0.3	7.1	3.0	0.0	0.0	0.3	2.0	0.0	2.4
LnGrp Delay(d),s/veh	43.4	34.4	34.4	68.2	46.3	41.9	0.0	0.0	38.8	40.9	0.0	9.5
LnGrp LOS	D	C	C	E	D	D			D	D		A
Approach Vol, veh/h		1911			555			9			308	
Approach Delay, s/veh		36.6			45.8			38.8			23.8	
Approach LOS		D			D			D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.8	84.2		29.4	58.0	32.0		28.6				
Change Period (Y+Rc), s	4.6	5.4		5.4	5.4	* 6.2		4.6				
Max Green Setting (Gmax), s	5.0	47.0		24.0	25.4	* 26		24.0				
Max Q Clear Time (g_c+I1), s	2.6	47.1		6.3	34.6	16.2		2.5				
Green Ext Time (p_c), s	0.0	0.0		0.9	0.0	2.7		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			37.0									
HCM 2010 LOS			D									
Notes												

Timings

5: Washington Av./Washington Av. & Orange Show Rd.

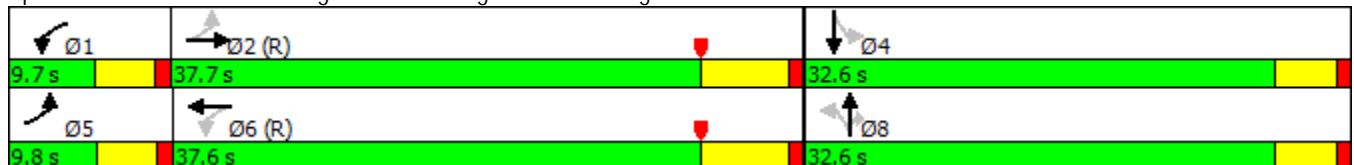


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↶	↶↷	↶	↶↷		↷		↷↶
Traffic Volume (vph)	50	1256	2	477	21	4	13	3
Future Volume (vph)	50	1256	2	477	21	4	13	3
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	9.6	23.2	32.6	32.6	32.6	32.6
Total Split (s)	9.8	37.7	9.7	37.6	32.6	32.6	32.6	32.6
Total Split (%)	12.3%	47.1%	12.1%	47.0%	40.8%	40.8%	40.8%	40.8%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effect Green (s)	67.8	66.2	66.8	61.0		13.6		13.6
Actuated g/C Ratio	0.85	0.83	0.84	0.76		0.17		0.17
v/c Ratio	0.04	0.47	0.00	0.19		0.09		0.08
Control Delay	4.7	9.0	6.0	7.2		25.4		19.1
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	4.7	9.0	6.0	7.2		25.4		19.1
LOS	A	A	A	A		C		B
Approach Delay		8.8		7.2		25.4		19.1
Approach LOS		A		A		C		B

Intersection Summary

Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.47
 Intersection Signal Delay: 8.7
 Intersection Capacity Utilization 63.5%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 5: Washington Av./Washington Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 5: Washington Av./Washington Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↖	↗		↕	↘
Traffic Volume (vph)	50	1256	45	2	477	20	21	4	0	13	3	7
Future Volume (vph)	50	1256	45	2	477	20	21	4	0	13	3	7
Ideal Flow (vphp)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2		4.6	6.2			4.6			4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			1.00			0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.97	
Satd. Flow (prot)	1700	3600		1700	3600			1800			1800	
Flt Permitted	0.44	1.00		0.16	1.00			0.74			0.82	
Satd. Flow (perm)	1700	3600		1700	3600			1800			1800	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	54	1351	48	2	513	22	23	4	0	14	3	8
RTOR Reduction (vph)	0	2	0	0	2	0	0	0	0	0	7	0
Lane Group Flow (vph)	54	1398	0	2	533	0	0	27	0	0	18	0
Confl. Peds. (#/hr)			1									
Confl. Bikes (#/hr)			1			1						
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)	59.1	56.0		54.9	53.9			7.6			7.6	
Effective Green, g (s)	59.1	56.0		54.9	53.9			7.6			7.6	
Actuated g/C Ratio	0.74	0.70		0.69	0.67			0.09			0.09	
Clearance Time (s)	4.6	6.2		4.6	6.2			4.6			4.6	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	1255	2520		1166	2425			171			171	
v/s Ratio Prot	c0.00	c0.39		0.00	0.15							
v/s Ratio Perm	0.03			0.00				0.01			0.01	
v/c Ratio	0.04	0.55		0.00	0.22			0.16			0.10	
Uniform Delay, d1	2.8	5.9		4.4	5.0			33.3			33.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	0.9		0.0	0.2			0.4			0.3	
Delay (s)	2.9	6.8		4.4	5.2			33.7			33.4	
Level of Service	A	A		A	A			C			C	
Approach Delay (s)		6.6			5.2			33.7			33.4	
Approach LOS		A			A			C			C	




















Intersection Summary		
HCM 2000 Control Delay	6.9	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.50	A
Actuated Cycle Length (s)	80.0	Sum of lost time (s)
Intersection Capacity Utilization	63.5%	15.4
Analysis Period (min)	15	ICU Level of Service
		B

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
 5: Washington Av./Washington Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	1256	45	2	477	20	21	4	0	13	3	7
Future Volume (veh/h)	50	1256	45	2	477	20	21	4	0	13	3	7
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	54	1351	48	2	513	22	23	4	0	14	3	0
Adj No. of Lanes	1	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	685	2447	87	295	2290	98	177	24	119	173	29	0
Arrive On Green	0.04	0.73	0.73	0.00	0.69	0.69	0.08	0.08	0.00	0.08	0.08	0.00
Sat Flow, veh/h	1619	3366	119	1619	3338	143	1203	309	1530	1167	373	0
Grp Volume(v), veh/h	54	685	714	2	262	273	27	0	0	17	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1776	1619	1710	1771	1513	0	1530	1540	0	0
Q Serve(g_s), s	0.7	14.6	14.7	0.0	4.6	4.6	0.5	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.7	14.6	14.7	0.0	4.6	4.6	1.2	0.0	0.0	0.7	0.0	0.0
Prop In Lane	1.00		0.07	1.00		0.08	0.85		1.00	0.82		0.00
Lane Grp Cap(c), veh/h	685	1243	1291	295	1173	1215	201	0	119	202	0	0
V/C Ratio(X)	0.08	0.55	0.55	0.01	0.22	0.22	0.13	0.00	0.00	0.08	0.00	0.00
Avail Cap(c_a), veh/h	720	1243	1291	394	1173	1215	604	0	535	607	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.71	0.71	0.71	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	3.0	5.0	5.0	4.7	4.7	4.7	34.5	0.0	0.0	34.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.8	1.7	0.0	0.3	0.3	0.3	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	7.3	7.6	0.0	2.2	2.3	0.6	0.0	0.0	0.4	0.0	0.0
LnGrp Delay(d),s/veh	3.0	6.7	6.7	4.7	5.0	5.0	34.8	0.0	0.0	34.5	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C			C		
Approach Vol, veh/h		1453			537			27				17
Approach Delay, s/veh		6.6			5.0			34.8				34.5
Approach LOS		A			A			C				C
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.8	64.3		10.8	8.1	61.1		10.8				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.1	31.5		28.0	5.2	31.4		28.0				
Max Q Clear Time (g_c+I1), s	2.0	16.7		2.7	2.7	6.6		3.2				
Green Ext Time (p_c), s	0.0	11.7		0.2	0.0	17.6		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			6.8									
HCM 2010 LOS			A									

Intersection

Int Delay, s/veh 1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	0	0	11	26	24
Future Vol, veh/h	10	0	0	11	26	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	11	0	0	12	28	26

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	53	41	54	0	-	0
Stage 1	41	-	-	-	-	-
Stage 2	12	-	-	-	-	-
Critical Hdwy	7.1	6.2	4.1	-	-	-
Critical Hdwy Stg 1	6.1	-	-	-	-	-
Critical Hdwy Stg 2	6.1	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	965	1047	1568	-	-	-
Stage 1	988	-	-	-	-	-
Stage 2	1014	-	-	-	-	-
Platoon blocked, %	1	1	1	-	-	-
Mov Cap-1 Maneuver	965	1047	1568	-	-	-
Mov Cap-2 Maneuver	965	-	-	-	-	-
Stage 1	988	-	-	-	-	-
Stage 2	1014	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1568	-	965	-	-
HCM Lane V/C Ratio	-	-	0.011	-	-
HCM Control Delay (s)	0	-	8.8	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection												
Int Delay, s/veh	5.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↔	
Traffic Vol, veh/h	0	0	0	0	0	13	0	0	0	26	0	0
Future Vol, veh/h	0	0	0	0	0	13	0	0	0	26	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	70	70	70	70	70	70	70	70	70	70	70
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	19	0	0	0	37	0	0

Major/Minor	Major1			Major2			Minor2				
Conflicting Flow All	19	0	-	-	-	0	-	-	9	9	9
Stage 1	-	-	-	-	-	-	-	-	9	9	-
Stage 2	-	-	-	-	-	-	-	-	0	0	-
Critical Hdwy	4.1	-	-	-	-	-	-	-	6.4	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	5.4	5.5	-
Follow-up Hdwy	2.2	-	-	-	-	-	-	-	3.5	4	3.3
Pot Cap-1 Maneuver	1611	-	0	0	-	-	-	-	1017	890	1079
Stage 1	-	-	0	0	-	-	-	-	1019	892	-
Stage 2	-	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1611	-	-	-	-	-	-	-	1017	0	1079
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	1017	0	-
Stage 1	-	-	-	-	-	-	-	-	1019	0	-
Stage 2	-	-	-	-	-	-	-	-	-	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1611	-	-	-	1017
HCM Lane V/C Ratio	-	-	-	-	0.037
HCM Control Delay (s)	0	-	-	-	8.7
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection

Int Delay, s/veh 7.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	0	0	13	0	10	0	26	24	0
Future Vol, veh/h	0	0	0	0	0	13	0	10	0	26	24	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	70	70	70	70	70	70	70	70	70	70	70
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	19	0	14	0	37	34	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	19	0	0	1	0	0	27	20	1	18	10	9
Stage 1	-	-	-	-	-	-	1	1	-	9	9	-
Stage 2	-	-	-	-	-	-	26	19	-	9	1	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1611	-	-	1635	-	-	988	878	1090	1001	889	1079
Stage 1	-	-	-	-	-	-	1027	899	-	1017	892	-
Stage 2	-	-	-	-	-	-	997	884	-	1017	899	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1611	-	-	1635	-	-	959	878	1090	989	889	1079
Mov Cap-2 Maneuver	-	-	-	-	-	-	959	878	-	989	889	-
Stage 1	-	-	-	-	-	-	1027	899	-	1017	892	-
Stage 2	-	-	-	-	-	-	959	884	-	1001	899	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	9.2	9.2
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	878	1611	-	-	1635	-	-	938
HCM Lane V/C Ratio	0.016	-	-	-	-	-	-	0.076
HCM Control Delay (s)	9.2	0	-	-	0	-	-	9.2
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.2

Timings

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.

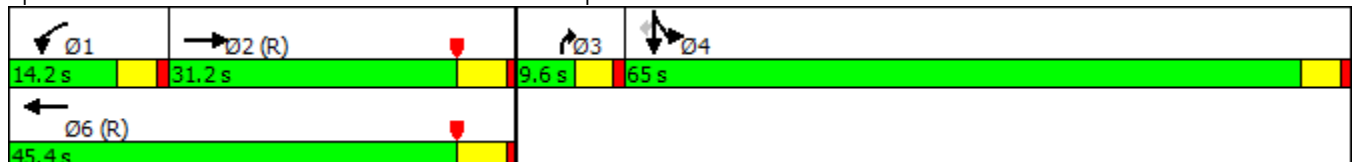


Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↖	↑↑	↗	↖	↗	↗
Traffic Volume (vph)	499	36	565	23	603	313	686
Future Volume (vph)	499	36	565	23	603	313	686
Turn Type	NA	Prot	NA	Prot	Split	NA	Perm
Protected Phases	2	1	6	3	4	4	
Permitted Phases							4
Detector Phase	2	1	6	3	4	4	4
Switch Phase							
Minimum Initial (s)	10.0	5.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	22.4	9.6	15.4	9.5	14.6	14.6	14.6
Total Split (s)	31.2	14.2	45.4	9.6	65.0	65.0	65.0
Total Split (%)	26.0%	11.8%	37.8%	8.0%	54.2%	54.2%	54.2%
Yellow Time (s)	4.4	3.6	4.4	3.5	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	4.6	5.4	4.5	4.6	4.6	4.6
Lead/Lag	Lag	Lead		Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes
Recall Mode	C-Max	None	C-Max	None	Max	Max	Max
Act Effect Green (s)	32.2	7.2	40.0	5.1	64.2	64.2	64.2
Actuated g/C Ratio	0.27	0.06	0.33	0.04	0.54	0.54	0.54
v/c Ratio	0.60	0.38	0.51	0.08	0.54	0.52	0.70
Control Delay	42.3	64.3	34.0	0.5	21.9	21.3	19.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.3	64.3	34.0	0.5	21.9	21.3	19.0
LOS	D	E	C	A	C	C	B
Approach Delay	42.3		35.8			20.5	
Approach LOS	D		D			C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 27.9
 Intersection LOS: C
 Intersection Capacity Utilization 69.7%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.






















HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑				↗	↖	↑↑	↗
Traffic Volume (vph)	0	499	32	36	565	0	0	0	23	603	313	686
Future Volume (vph)	0	499	32	36	565	0	0	0	23	603	313	686
Ideal Flow (vphpl)	1800	1800	1800	1700	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Lane Util. Factor		0.95		1.00	0.95				1.00	0.95	0.95	1.00
Frbp, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Frt		0.99		1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00				1.00	0.95	0.98	1.00
Satd. Flow (prot)		3600		1700	3600				1800	1700	1800	1800
Flt Permitted		1.00		0.95	1.00				1.00	0.95	0.98	1.00
Satd. Flow (perm)		3600		1700	3600				1800	1700	1800	1800
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	542	35	39	614	0	0	0	25	655	340	746
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	24	0	0	102
Lane Group Flow (vph)	0	573	0	39	614	0	0	0	1	491	504	644
Confl. Peds. (#/hr)			6			1						
Confl. Bikes (#/hr)						2						
Turn Type		NA		Prot	NA				Prot	Split	NA	Perm
Protected Phases		2		1	6				3	4	4	
Permitted Phases												4
Actuated Green, G (s)		28.6		5.0	38.2				3.1	64.2	64.2	64.2
Effective Green, g (s)		28.6		5.0	38.2				3.1	64.2	64.2	64.2
Actuated g/C Ratio		0.24		0.04	0.32				0.03	0.54	0.54	0.54
Clearance Time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Vehicle Extension (s)		3.0		2.0	3.0				3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		858		70	1146				46	909	963	963
v/s Ratio Prot		c0.16		0.02	c0.17				c0.00	0.29	0.28	
v/s Ratio Perm												c0.36
v/c Ratio		0.67		0.56	0.54				0.01	0.54	0.52	0.67
Uniform Delay, d1		41.4		56.4	33.6				57.0	18.2	18.0	20.2
Progression Factor		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		4.1		5.4	1.8				0.1	2.3	2.0	3.7
Delay (s)		45.5		61.8	35.4				57.1	20.5	20.1	23.9
Level of Service		D		E	D				E	C	C	C
Approach Delay (s)		45.5			37.0			57.1			21.8	
Approach LOS		D			D			E			C	

Intersection Summary			
HCM 2000 Control Delay	30.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.1
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	499	32	36	565	0	0	0	23	603	313	686
Future Volume (veh/h)	0	499	32	36	565	0	0	0	23	603	313	686
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	0	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	542	24	39	614	0	0	0	12	498	560	744
Adj No. of Lanes	0	2	0	1	2	0	0	0	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1150	51	49	1414	0	0	0	0	815	906	770
Arrive On Green	0.00	0.34	0.34	0.03	0.41	0.00	0.00	0.00	0.00	0.50	0.50	0.50
Sat Flow, veh/h	0	3425	147	1619	3510	0		0		1619	1800	1530
Grp Volume(v), veh/h	0	278	288	39	614	0		0.0		498	560	744
Grp Sat Flow(s),veh/h/ln	0	1710	1772	1619	1710	0				1619	1800	1530
Q Serve(g_s), s	0.0	15.2	15.3	2.9	15.4	0.0				26.5	26.9	56.4
Cycle Q Clear(g_c), s	0.0	15.2	15.3	2.9	15.4	0.0				26.5	26.9	56.4
Prop In Lane	0.00		0.08	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	589	611	49	1414	0				815	906	770
V/C Ratio(X)	0.00	0.47	0.47	0.79	0.43	0.00				0.61	0.62	0.97
Avail Cap(c_a), veh/h	0	589	611	130	1414	0				815	906	770
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.73	0.73	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	30.8	30.8	57.8	25.2	0.0				21.4	21.5	28.8
Incr Delay (d2), s/veh	0.0	2.7	2.6	7.6	0.7	0.0				3.4	3.2	25.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.6	7.9	1.4	7.4	0.0				12.5	14.2	29.1
LnGrp Delay(d),s/veh	0.0	33.4	33.4	65.5	25.9	0.0				24.8	24.6	54.0
LnGrp LOS		C	C	E	C					C	C	D
Approach Vol, veh/h		566			653						1802	
Approach Delay, s/veh		33.4			28.2						36.8	
Approach LOS		C			C						D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	8.2	46.8		65.0		55.0						
Change Period (Y+Rc), s	4.6	5.4		4.6		5.4						
Max Green Setting (Gmax), s	9.6	25.8		60.4		40.0						
Max Q Clear Time (g_c+I1), s	4.9	17.3		58.4		17.4						
Green Ext Time (p_c), s	0.0	4.4		1.5		7.6						
Intersection Summary												
HCM 2010 Ctrl Delay				34.3								
HCM 2010 LOS				C								
Notes												

Timings

9: Waterman Av. & Orange Show Rd./Orange Show Rd.

3/27/2017

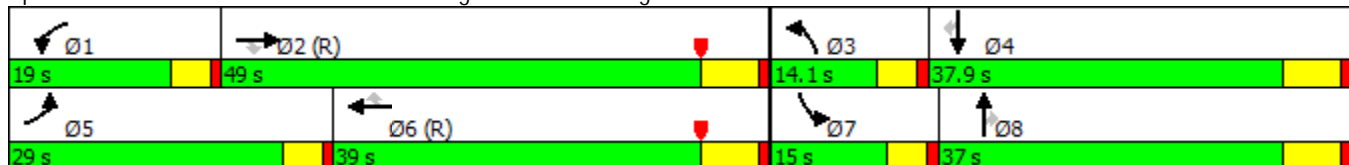


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	202	627	426	178	333	92	100	522	156	81	634	74
Future Volume (vph)	202	627	426	178	333	92	100	522	156	81	634	74
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.2	35.2	9.6	35.2	35.2	9.6	33.2	33.2	9.6	33.2	33.2
Total Split (s)	29.0	49.0	49.0	19.0	39.0	39.0	14.1	37.0	37.0	15.0	37.9	37.9
Total Split (%)	24.2%	40.8%	40.8%	15.8%	32.5%	32.5%	11.8%	30.8%	30.8%	12.5%	31.6%	31.6%
Yellow Time (s)	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Act Effect Green (s)	20.0	42.8	42.8	14.4	37.2	37.2	9.4	31.8	31.8	9.4	31.8	31.8
Actuated g/C Ratio	0.17	0.36	0.36	0.12	0.31	0.31	0.08	0.26	0.26	0.08	0.26	0.26
v/c Ratio	0.83	0.57	0.63	1.01	0.69	0.16	0.87	0.64	0.30	0.71	0.77	0.15
Control Delay	71.4	33.3	20.1	119.4	45.3	2.0	105.1	42.8	6.4	81.3	47.3	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.4	33.3	20.1	119.4	45.3	2.0	105.1	42.8	6.4	81.3	47.3	0.5
LOS	E	C	C	F	D	A	F	D	A	F	D	A
Approach Delay		34.9			60.6			43.5			46.4	
Approach LOS		C			E			D			D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.01
 Intersection Signal Delay: 44.0
 Intersection LOS: D
 Intersection Capacity Utilization 73.7%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	202	627	426	178	333	92	100	522	156	81	634	74
Future Volume (vph)	202	627	426	178	333	92	100	522	156	81	634	74
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	235	729	495	207	387	107	116	607	181	94	737	86
RTOR Reduction (vph)	0	0	150	0	0	74	0	0	133	0	0	63
Lane Group Flow (vph)	235	729	345	207	387	33	116	607	48	94	737	23
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	NA	4
Permitted Phases			2			6			8			4
Actuated Green, G (s)	20.0	42.8	42.8	14.4	37.2	37.2	9.4	31.8	31.8	9.4	31.8	31.8
Effective Green, g (s)	20.0	42.8	42.8	14.4	37.2	37.2	9.4	31.8	31.8	9.4	31.8	31.8
Actuated g/C Ratio	0.17	0.36	0.36	0.12	0.31	0.31	0.08	0.27	0.27	0.08	0.27	0.27
Clearance Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	283	1284	642	204	558	558	133	954	477	133	954	477
v/s Ratio Prot	c0.14	0.20		c0.12	c0.21		c0.07	0.17		0.06	c0.20	
v/s Ratio Perm			0.19			0.02			0.03			0.01
v/c Ratio	0.83	0.57	0.54	1.01	0.69	0.06	0.87	0.64	0.10	0.71	0.77	0.05
Uniform Delay, d1	48.4	31.1	30.7	52.8	36.4	29.1	54.7	39.0	33.3	54.0	40.8	32.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	17.6	1.8	3.2	66.9	7.0	0.2	41.2	3.2	0.4	13.1	6.1	0.2
Delay (s)	65.9	33.0	33.9	119.7	43.3	29.3	95.9	42.2	33.7	67.0	46.8	33.0
Level of Service	E	C	C	F	D	C	F	D	C	E	D	C
Approach Delay (s)		38.6			63.7			47.4			47.6	
Approach LOS		D			E			D			D	

Intersection Summary

























HCM 2000 Control Delay	47.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	73.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	202	627	426	178	333	92	100	522	156	81	634	74
Future Volume (veh/h)	202	627	426	178	333	92	100	522	156	81	634	74
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	235	729	396	207	387	66	116	607	145	94	737	63
Adj No. of Lanes	1	2	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	260	1220	546	194	569	484	128	932	417	115	903	404
Arrive On Green	0.16	0.36	0.36	0.12	0.32	0.32	0.08	0.27	0.27	0.07	0.26	0.26
Sat Flow, veh/h	1619	3420	1530	1619	1800	1530	1619	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	235	729	396	207	387	66	116	607	145	94	737	63
Grp Sat Flow(s),veh/h/ln	1619	1710	1530	1619	1800	1530	1619	1710	1530	1619	1710	1530
Q Serve(g_s), s	17.1	20.9	27.0	14.4	22.5	3.7	8.5	18.8	9.1	6.9	24.3	3.8
Cycle Q Clear(g_c), s	17.1	20.9	27.0	14.4	22.5	3.7	8.5	18.8	9.1	6.9	24.3	3.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	260	1220	546	194	569	484	128	932	417	115	903	404
V/C Ratio(X)	0.90	0.60	0.73	1.07	0.68	0.14	0.91	0.65	0.35	0.82	0.82	0.16
Avail Cap(c_a), veh/h	329	1220	546	194	569	484	128	932	417	140	903	404
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.88	0.88	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.5	31.6	33.5	52.8	35.7	29.3	54.8	38.6	35.1	55.0	41.4	33.9
Incr Delay (d2), s/veh	19.0	1.9	7.3	83.0	6.4	0.6	50.6	3.5	2.3	22.1	8.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.0	10.1	12.5	10.9	12.2	1.6	5.6	9.3	4.1	3.8	12.5	1.7
LnGrp Delay(d),s/veh	68.5	33.5	40.8	135.8	42.2	29.9	105.4	42.1	37.4	77.1	49.5	34.7
LnGrp LOS	E	C	D	F	D	C	F	D	D	E	D	C
Approach Vol, veh/h		1360			660			868			894	
Approach Delay, s/veh		41.6			70.3			49.8			51.3	
Approach LOS		D			E			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.0	49.0	14.1	37.9	23.8	44.2	13.1	38.9				
Change Period (Y+Rc), s	4.6	6.2	4.6	6.2	4.6	6.2	4.6	6.2				
Max Green Setting (Gmax), s	14.4	42.8	9.5	31.7	24.4	32.8	10.4	30.8				
Max Q Clear Time (g_c+I1), s	16.4	29.0	10.5	26.3	19.1	24.5	8.9	20.8				
Green Ext Time (p_c), s	0.0	9.0	0.0	3.7	0.1	6.0	0.0	5.9				
Intersection Summary												
HCM 2010 Ctrl Delay			50.8									
HCM 2010 LOS			D									

Intersection

Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↕	↕
Traffic Vol, veh/h	3	13	8	775	1268	16
Future Vol, veh/h	3	13	8	775	1268	16
Conflicting Peds, #/hr	0	0	0	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	75	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	4	16	10	969	1585	20

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	2101	805	1607	0	0
Stage 1	1597	-	-	-	-
Stage 2	504	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	*46	*568	648	-	-
Stage 1	*377	-	-	-	-
Stage 2	*749	-	-	-	-
Platoon blocked, %		1	1	-	-
Mov Cap-1 Maneuver	*45	*567	648	-	-
Mov Cap-2 Maneuver	*246	-	-	-	-
Stage 1	*377	-	-	-	-
Stage 2	*736	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.1	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	648	-	246	567	-	-
HCM Lane V/C Ratio	0.015	-	0.015	0.029	-	-
HCM Control Delay (s)	10.6	-	19.9	11.5	-	-
HCM Lane LOS	B	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0	0.1	-	-

Notes

-: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Timings
11: Waterman Av. & Driveway 2/Park Center Dr.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↕		↕	↕	↕	↑↑	↕	↕	↕↕
Traffic Volume (vph)	20	0	21	1	8	72	817	125	48	960
Future Volume (vph)	20	0	21	1	8	72	817	125	48	960
Turn Type	Perm	NA	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4		8		5	2		1	6
Permitted Phases	4		8		8	2		2	6	
Detector Phase	4	4	8	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	21.6	21.6	21.6	9.6	23.2	23.2	9.6	33.2
Total Split (s)	21.6	21.6	21.6	21.6	21.6	9.6	32.0	32.0	11.4	33.8
Total Split (%)	33.2%	33.2%	33.2%	33.2%	33.2%	14.8%	49.2%	49.2%	17.5%	52.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		4.6	4.6	4.6	6.2	6.2	4.6	6.2
Lead/Lag						Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)		11.4		11.4	11.4	47.4	44.9	44.9	49.4	41.9
Actuated g/C Ratio		0.18		0.18	0.18	0.73	0.69	0.69	0.76	0.64
v/c Ratio		0.15		0.09	0.02	0.28	0.41	0.12	0.05	0.54
Control Delay		0.9		21.7	0.1	6.5	9.7	3.0	4.1	11.4
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		0.9		21.7	0.1	6.5	9.7	3.0	4.1	11.4
LOS		A		C	A	A	A	A	A	B
Approach Delay		0.9		15.9			8.6			11.0
Approach LOS		A		B			A			B

Intersection Summary

Cycle Length: 65
 Actuated Cycle Length: 65
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.54
 Intersection Signal Delay: 9.8
 Intersection Capacity Utilization 56.2%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 11: Waterman Av. & Driveway 2/Park Center Dr.



HCM Signalized Intersection Capacity Analysis
 11: Waterman Av. & Driveway 2/Park Center Dr.

Gateway South Building 4 TIA (JN 10187)






















3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↕	↕	↕	↕↕	
Traffic Volume (vph)	20	0	22	21	1	8	72	817	125	48	960	49
Future Volume (vph)	20	0	22	21	1	8	72	817	125	48	960	49
Ideal Flow (vphp)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)		4.6			4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes		1.00			1.00	1.00	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.93			1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.98			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1635			1800	1800	1615	3600	1800	1700	3600	
Flt Permitted		0.83			0.70	1.00	0.17	1.00	1.00	0.25	1.00	
Satd. Flow (perm)		1395			1800	1800	282	3600	1800	1700	3600	
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	25	0	27	26	1	10	89	1009	154	59	1185	60
RTOR Reduction (vph)	0	46	0	0	0	9	0	0	58	0	4	0
Lane Group Flow (vph)	0	6	0	0	27	1	89	1009	96	59	1241	0
Confl. Bikes (#/hr)									2			2
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		7.4			7.4	7.4	43.0	38.7	38.7	41.4	37.9	
Effective Green, g (s)		7.4			7.4	7.4	43.0	38.7	38.7	41.4	37.9	
Actuated g/C Ratio		0.11			0.11	0.11	0.66	0.60	0.60	0.64	0.58	
Clearance Time (s)		4.6			4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Vehicle Extension (s)		3.0			3.0	3.0	2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)		158			204	204	274	2143	1071	1082	2099	
v/s Ratio Prot							c0.02	0.28		0.00	c0.34	
v/s Ratio Perm		0.00			0.01	0.00	0.19		0.05	0.03		
v/c Ratio		0.04			0.13	0.01	0.32	0.47	0.09	0.05	0.59	
Uniform Delay, d1		25.6			25.9	25.5	5.0	7.4	5.6	4.6	8.6	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.1			0.3	0.0	0.3	0.7	0.2	0.0	1.2	
Delay (s)		25.7			26.2	25.5	5.2	8.1	5.8	4.6	9.9	
Level of Service		C			C	C	A	A	A	A	A	
Approach Delay (s)		25.7			26.0			7.6			9.6	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	15.4
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	0	22	21	1	8	72	817	125	48	960	49
Future Volume (veh/h)	20	0	22	21	1	8	72	817	125	48	960	49
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	25	0	27	26	1	8	89	1009	150	59	1185	60
Adj No. of Lanes	0	1	0	0	1	1	1	2	1	1	2	0
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	147	24	96	281	9	186	358	2021	885	387	1918	97
Arrive On Green	0.12	0.00	0.12	0.12	0.12	0.12	0.06	0.59	0.59	0.05	0.58	0.58
Sat Flow, veh/h	532	200	790	1416	72	1530	1619	3420	1497	1619	3309	167
Grp Volume(v), veh/h	52	0	0	27	0	8	89	1009	150	59	612	633
Grp Sat Flow(s),veh/h/ln	1522	0	0	1488	0	1530	1619	1710	1497	1619	1710	1766
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.3	1.4	11.1	3.0	0.9	15.2	15.3
Cycle Q Clear(g_c), s	1.9	0.0	0.0	0.9	0.0	0.3	1.4	11.1	3.0	0.9	15.2	15.3
Prop In Lane	0.48		0.52	0.96		1.00	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	268	0	0	290	0	186	358	2021	885	387	991	1024
V/C Ratio(X)	0.19	0.00	0.00	0.09	0.00	0.04	0.25	0.50	0.17	0.15	0.62	0.62
Avail Cap(c_a), veh/h	474	0	0	488	0	400	383	2021	885	475	991	1024
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.9	0.0	0.0	25.5	0.0	25.2	6.7	7.7	6.0	5.6	8.9	8.9
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.1	0.0	0.1	0.1	0.9	0.4	0.1	2.9	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	0.4	0.0	0.1	0.6	5.4	1.3	0.4	7.9	8.2
LnGrp Delay(d),s/veh	26.2	0.0	0.0	25.6	0.0	25.3	6.8	8.6	6.5	5.6	11.8	11.7
LnGrp LOS	C			C		C	A	A	A	A	B	B
Approach Vol, veh/h		52			35			1248			1304	
Approach Delay, s/veh		26.2			25.5			8.2			11.5	
Approach LOS		C			C			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.9	44.6		12.5	8.6	43.9		12.5				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	6.8	25.8		17.0	5.0	27.6		17.0				
Max Q Clear Time (g_c+I1), s	2.9	13.1		3.9	3.4	17.3		2.9				
Green Ext Time (p_c), s	0.0	11.3		0.3	0.0	9.4		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay			10.4									
HCM 2010 LOS			B									

Timings

12: Waterman Av./Waterman Av. & Hospitality Ln.

3/27/2017

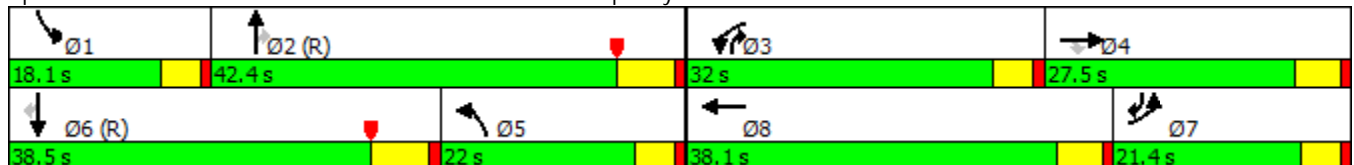


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	163	188	143	440	410	294	957	848	133	585	152
Future Volume (vph)	163	188	143	440	410	294	957	848	133	585	152
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8	5	2	3	1	6	7
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	3	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	15.1	15.1	9.6	38.1	9.6	36.2	9.6	9.6	36.2	9.6
Total Split (s)	21.4	27.5	27.5	32.0	38.1	22.0	42.4	32.0	18.1	38.5	21.4
Total Split (%)	17.8%	22.9%	22.9%	26.7%	31.8%	18.3%	35.3%	26.7%	15.1%	32.1%	17.8%
Yellow Time (s)	3.6	4.1	4.1	3.6	4.1	3.6	5.2	3.6	3.6	5.2	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	5.1	4.6	5.1	4.6	6.2	4.6	4.6	6.2	4.6
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effect Green (s)	15.8	18.5	18.5	22.6	25.4	17.4	45.0	73.9	13.3	40.9	62.9
Actuated g/C Ratio	0.13	0.15	0.15	0.19	0.21	0.14	0.38	0.62	0.11	0.34	0.52
v/c Ratio	0.78	0.43	0.26	0.78	0.76	0.68	0.76	0.38	0.76	0.34	0.16
Control Delay	74.0	44.1	2.4	55.8	47.3	56.9	39.2	6.7	76.6	31.5	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.0	44.1	2.4	55.8	47.3	56.9	39.2	6.7	76.6	31.5	6.0
LOS	E	D	A	E	D	E	D	A	E	C	A
Approach Delay		45.5			51.0		28.6			34.0	
Approach LOS		D			D		C			C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 105
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 36.5
 Intersection LOS: D
 Intersection Capacity Utilization 83.4%
 ICU Level of Service E
 Analysis Period (min) 15

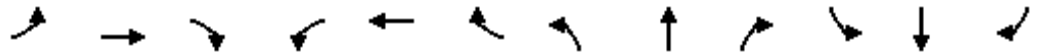
Splits and Phases: 12: Waterman Av./Waterman Av. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
 12: Waterman Av./Waterman Av. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)

3/27/2017


























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	188	143	440	410	157	294	957	848	133	585	152
Future Volume (vph)	163	188	143	440	410	157	294	957	848	133	585	152
Ideal Flow (vphpl)	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Lane Util. Factor	1.00	0.91	0.91	0.97	0.95		0.97	0.95	0.88	1.00	0.91	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	175	202	154	473	441	169	316	1029	912	143	629	163
RTOR Reduction (vph)	0	16	91	0	36	0	0	0	185	0	0	62
Lane Group Flow (vph)	175	232	17	473	574	0	316	1029	727	143	629	101
Confl. Peds. (#/hr)							9		1			3
Confl. Bikes (#/hr)							2		3			
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4						2			6
Actuated Green, G (s)	15.8	18.6	18.6	22.6	25.4		17.4	45.0	67.6	13.3	40.9	56.7
Effective Green, g (s)	15.8	18.6	18.6	22.6	25.4		17.4	45.0	67.6	13.3	40.9	56.7
Actuated g/C Ratio	0.13	0.16	0.16	0.19	0.21		0.14	0.38	0.56	0.11	0.34	0.47
Clearance Time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	4.0	2.0	2.0	4.0	2.0
Lane Grp Cap (vph)	223	558	279	602	762		464	1350	2028	188	1840	919
v/s Ratio Prot	c0.10	c0.06		0.15	c0.16		0.10	c0.29	0.07	c0.08	0.12	0.01
v/s Ratio Perm			0.01						0.13			0.04
v/c Ratio	0.78	0.42	0.06	0.79	0.75		0.68	0.76	0.36	0.76	0.34	0.11
Uniform Delay, d1	50.5	45.8	43.2	46.4	44.4		48.7	32.8	14.3	51.8	29.5	17.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.3	0.5	0.1	6.2	4.2		3.3	4.1	0.0	15.0	0.5	0.0
Delay (s)	65.7	46.3	43.3	52.6	48.6		51.9	36.9	14.4	66.8	30.0	17.6
Level of Service	E	D	D	D	D		D	D	B	E	C	B
Approach Delay (s)		52.1			50.3			29.9			33.5	
Approach LOS		D			D			C			C	

Intersection Summary

HCM 2000 Control Delay	37.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	163	188	143	440	410	157	294	957	848	133	585	152
Future Volume (veh/h)	163	188	143	440	410	157	294	957	848	133	585	152
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	175	202	80	473	441	154	316	1029	480	143	629	65
Adj No. of Lanes	1	2	1	2	2	0	2	2	2	1	3	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	203	614	261	527	543	188	585	1291	1472	167	1323	603
Arrive On Green	0.13	0.17	0.17	0.18	0.22	0.22	0.20	0.38	0.38	0.10	0.27	0.27
Sat Flow, veh/h	1619	3600	1530	2956	2476	856	2956	3420	2628	1619	4914	1525
Grp Volume(v), veh/h	175	202	80	473	303	292	316	1029	480	143	629	65
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	1710	1622	1478	1710	1314	1619	1638	1525
Q Serve(g_s), s	12.7	5.9	3.6	18.8	20.2	20.6	11.5	32.1	11.9	10.4	12.9	0.0
Cycle Q Clear(g_c), s	12.7	5.9	3.6	18.8	20.2	20.6	11.5	32.1	11.9	10.4	12.9	0.0
Prop In Lane	1.00		1.00	1.00		0.53	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	203	614	261	527	375	355	585	1291	1472	167	1323	603
V/C Ratio(X)	0.86	0.33	0.31	0.90	0.81	0.82	0.54	0.80	0.33	0.86	0.48	0.11
Avail Cap(c_a), veh/h	227	672	286	675	470	446	585	1291	1472	182	1323	603
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.63	0.63	0.63	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.4	43.7	18.3	48.2	44.5	44.6	43.2	33.3	14.5	53.0	36.8	23.0
Incr Delay (d2), s/veh	23.2	0.3	0.7	7.3	5.3	6.2	0.6	5.2	0.6	27.7	1.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.0	3.0	1.5	8.2	10.1	9.9	4.7	16.1	4.4	6.0	6.0	1.4
LnGrp Delay(d),s/veh	74.7	44.0	18.9	55.6	49.8	50.8	43.8	38.4	15.1	80.7	38.0	23.3
LnGrp LOS	E	D	B	E	D	D	D	D	B	F	D	C
Approach Vol, veh/h		457			1068			1825			837	
Approach Delay, s/veh		51.4			52.7			33.2			44.1	
Approach LOS		D			D			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.9	51.5	26.0	25.6	29.9	38.5	20.2	31.4				
Change Period (Y+Rc), s	4.6	6.2	4.6	5.1	6.2	* 6.2	5.1	* 5.1				
Max Green Setting (Gmax), s	13.5	36.2	27.4	22.4	17.4	* 32	16.8	* 33				
Max Q Clear Time (g_c+I1), s	12.4	34.1	20.8	7.9	13.5	14.9	14.7	22.6				
Green Ext Time (p_c), s	0.0	1.8	0.6	1.4	1.5	5.1	0.4	2.6				
Intersection Summary												
HCM 2010 Ctrl Delay			42.3									
HCM 2010 LOS			D									
Notes												

Intersection

Int Delay, s/veh 0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↖ ↗	↖ ↗	↖ ↗ ↘	
Traffic Vol, veh/h	0	0	297	2098	1001	170
Future Vol, veh/h	0	0	297	2098	1001	170
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	0	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	309	2185	1043	177

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	521	1043 0
Stage 1	-	-	- -
Stage 2	-	-	- -
Critical Hdwy	-	7.1	5.3 -
Critical Hdwy Stg 1	-	-	- -
Critical Hdwy Stg 2	-	-	- -
Follow-up Hdwy	-	3.9	3.1 -
Pot Cap-1 Maneuver	0	*702	*883 -
Stage 1	0	-	- -
Stage 2	0	-	- -
Platoon blocked, %	-	1	1 -
Mov Cap-1 Maneuver	-	*702	*883 -
Mov Cap-2 Maneuver	-	-	- -
Stage 1	-	-	- -
Stage 2	-	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	0	1.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	* 883	-	-	-	-
HCM Lane V/C Ratio	0.35	-	-	-	-
HCM Control Delay (s)	11.3	-	0	-	-
HCM Lane LOS	B	-	A	-	-
HCM 95th %tile Q(veh)	1.6	-	-	-	-

Notes

-: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations						↗		↑↑			↑↑	
Traffic Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Future Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	-	-	-	Free	-	-	-	-	-	None
Storage Length	-	-	-	-	-	0	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	1209	0	998	0	0	746	171

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	-	-	-	-	0	-	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	0	0	-	0	0	-	0
Stage 1	0	0	0	0	-	0	0	-	0
Stage 2	0	0	0	0	-	0	0	-	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBTWBLn1	SBT	SBR
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	-	0	-
HCM Lane LOS	-	A	-
HCM 95th %tile Q(veh)	-	-	-

Intersection

Int Delay, s/veh

Movement	NWL	NWR
Lane Configurations		
Traffic Vol, veh/h	0	0
Future Vol, veh/h	0	0
Conflicting Peds, #/hr	0	0
Sign Control	Stop	Stop
RT Channelized	-	-
Storage Length	-	-
Veh in Median Storage, #	0	-
Grade, %	0	-
Peak Hour Factor	95	95
Heavy Vehicles, %	0	0
Mvmt Flow	0	0

Major/Minor

Conflicting Flow All

Stage 1

Stage 2

Critical Hdwy

Critical Hdwy Stg 1

Critical Hdwy Stg 2

Follow-up Hdwy

Pot Cap-1 Maneuver

Stage 1

Stage 2

Platoon blocked, %

Mov Cap-1 Maneuver

Mov Cap-2 Maneuver

Stage 1

Stage 2

Approach

HCM Control Delay, s

HCM LOS

Minor Lane/Major Mvmt

Timings

15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.

3/27/2017

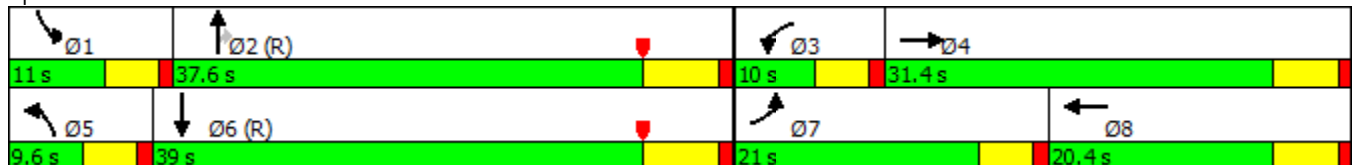


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖↗	↕	↖	↕	↖	↕	↗	↖	↕
Traffic Volume (vph)	512	388	112	240	61	864	114	86	469
Future Volume (vph)	512	388	112	240	61	864	114	86	469
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	9.6	31.4	9.6	15.4	9.6	36.2	36.2	9.6	36.2
Total Split (s)	21.0	31.4	10.0	20.4	9.6	37.6	37.6	11.0	39.0
Total Split (%)	23.3%	34.9%	11.1%	22.7%	10.7%	41.8%	41.8%	12.2%	43.3%
Yellow Time (s)	3.6	4.4	3.6	4.4	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	5.4	4.6	6.2	6.2	4.6	6.2
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)	16.2	23.5	5.4	12.6	6.0	33.0	33.0	7.3	36.3
Actuated g/C Ratio	0.18	0.26	0.06	0.14	0.07	0.37	0.37	0.08	0.40
v/c Ratio	0.92	0.63	1.15	0.65	0.57	0.68	0.15	0.65	0.51
Control Delay	60.2	24.8	175.3	33.8	62.4	27.7	0.8	64.0	17.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.2	24.8	175.3	33.8	62.4	27.7	0.8	64.0	17.8
LOS	E	C	F	C	E	C	A	E	B
Approach Delay		40.6		67.5		26.8			22.5
Approach LOS		D		E		C			C

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.15
 Intersection Signal Delay: 35.8
 Intersection LOS: D
 Intersection Capacity Utilization 76.2%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.

























HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔	↕↔		↔	↕↕	↔	↔	↕↔	
Traffic Volume (vph)	512	388	243	112	240	119	61	864	114	86	469	292
Future Volume (vph)	512	388	243	112	240	119	61	864	114	86	469	292
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.94		1.00	0.95		1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Flt Permitted	1.00	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	533	404	253	117	250	124	64	900	119	90	489	304
RTOR Reduction (vph)	0	113	0	0	70	0	0	0	75	0	103	0
Lane Group Flow (vph)	533	544	0	117	304	0	64	900	44	90	690	0
Confl. Peds. (#/hr)			3						1			4
Confl. Bikes (#/hr)			1						1			
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	16.2	23.5		5.4	12.7		5.0	33.0	33.0	7.3	35.3	
Effective Green, g (s)	16.2	23.5		5.4	12.7		5.0	33.0	33.0	7.3	35.3	
Actuated g/C Ratio	0.18	0.26		0.06	0.14		0.06	0.37	0.37	0.08	0.39	
Clearance Time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	576	940		102	508		94	1320	660	137	1412	
v/s Ratio Prot	c0.17	c0.15		0.07	0.08		0.04	c0.25		c0.05	0.19	
v/s Ratio Perm									0.02			
v/c Ratio	0.93	0.58		1.15	0.60		0.68	0.68	0.07	0.66	0.49	
Uniform Delay, d1	36.3	28.9		42.3	36.3		41.7	24.1	18.5	40.1	20.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	20.6	0.9		134.1	1.9		14.9	2.9	0.2	8.4	1.2	
Delay (s)	56.9	29.8		176.4	38.1		56.7	26.9	18.7	48.5	21.8	
Level of Service	E	C		F	D		E	C	B	D	C	
Approach Delay (s)		41.9			71.1			27.8			24.5	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	37.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	20.8
Intersection Capacity Utilization	76.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	512	388	243	112	240	119	61	864	114	86	469	292
Future Volume (veh/h)	512	388	243	112	240	119	61	864	114	86	469	292
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	533	404	199	117	250	99	64	900	77	90	489	249
Adj No. of Lanes	2	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	539	594	289	97	351	135	79	1273	562	112	862	436
Arrive On Green	0.18	0.27	0.27	0.06	0.15	0.15	0.05	0.37	0.37	0.07	0.39	0.39
Sat Flow, veh/h	2956	2220	1079	1619	2415	931	1619	3420	1510	1619	2197	1113
Grp Volume(v), veh/h	533	310	293	117	175	174	64	900	77	90	380	358
Grp Sat Flow(s),veh/h/ln	1478	1710	1589	1619	1710	1636	1619	1710	1510	1619	1710	1600
Q Serve(g_s), s	16.2	14.6	14.9	5.4	8.8	9.2	3.5	20.2	3.0	4.9	15.6	15.8
Cycle Q Clear(g_c), s	16.2	14.6	14.9	5.4	8.8	9.2	3.5	20.2	3.0	4.9	15.6	15.8
Prop In Lane	1.00		0.68	1.00		0.57	1.00		1.00	1.00		0.70
Lane Grp Cap(c), veh/h	539	458	425	97	249	238	79	1273	562	112	671	627
V/C Ratio(X)	0.99	0.68	0.69	1.20	0.70	0.73	0.81	0.71	0.14	0.81	0.57	0.57
Avail Cap(c_a), veh/h	539	494	459	97	285	273	90	1273	562	115	671	627
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.81	0.81	0.81	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.7	29.5	29.6	42.3	36.6	36.8	42.4	24.1	18.7	41.3	21.4	21.4
Incr Delay (d2), s/veh	32.1	2.7	3.2	156.3	6.5	8.3	32.5	3.3	0.5	30.0	3.4	3.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.0	7.2	6.9	6.6	4.6	4.7	2.3	10.1	1.3	3.1	8.0	7.6
LnGrp Delay(d),s/veh	68.8	32.2	32.8	198.6	43.1	45.1	74.8	27.4	19.2	71.3	24.8	25.2
LnGrp LOS	E	C	C	F	D	D	E	C	B	E	C	C
Approach Vol, veh/h		1136			466			1041			828	
Approach Delay, s/veh		49.5			82.9			29.7			30.0	
Approach LOS		D			F			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.8	39.7	10.0	29.5	9.0	41.5	21.0	18.5				
Change Period (Y+Rc), s	4.6	6.2	4.6	5.4	4.6	6.2	4.6	5.4				
Max Green Setting (Gmax), s	6.4	31.4	5.4	26.0	5.0	32.8	16.4	15.0				
Max Q Clear Time (g_c+I1), s	6.9	22.2	7.4	16.9	5.5	17.8	18.2	11.2				
Green Ext Time (p_c), s	0.0	7.2	0.0	3.7	0.0	10.8	0.0	1.9				
Intersection Summary												
HCM 2010 Ctrl Delay			43.4									
HCM 2010 LOS			D									

Timings
16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

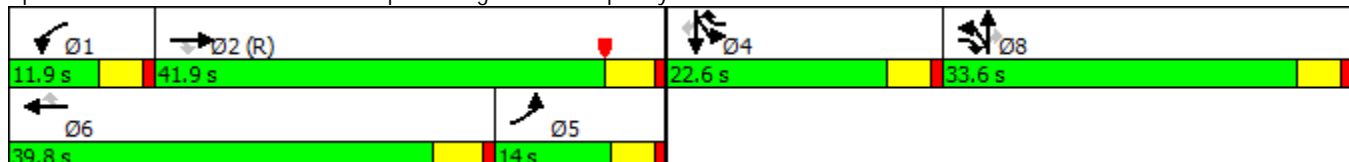


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	111	181	60	43	110	622	383	736	190	8	499	124
Future Volume (vph)	111	181	60	43	110	622	383	736	190	8	499	124
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	8	1	6	4	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	39.1	33.6	9.6	39.1	22.6	33.6	33.6	33.6	22.6	22.6	22.6
Total Split (s)	14.0	41.9	33.6	11.9	39.8	22.6	33.6	33.6	33.6	22.6	22.6	22.6
Total Split (%)	12.7%	38.1%	30.5%	10.8%	36.2%	20.5%	30.5%	30.5%	30.5%	20.5%	20.5%	20.5%
Yellow Time (s)	3.6	4.1	3.6	3.6	4.1	3.6	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	C-Max	Max	None	None	Max	Max	Max	Max	Max	Max	Max
Act Effect Green (s)	29.1	40.0	70.4	6.0	15.0	33.5	29.0	29.0	29.0	18.0	18.0	18.0
Actuated g/C Ratio	0.26	0.36	0.64	0.05	0.14	0.30	0.26	0.26	0.26	0.16	0.16	0.16
v/c Ratio	0.25	0.14	0.05	0.25	0.56	0.68	0.79	0.83	0.33	0.03	0.86	0.30
Control Delay	37.6	24.9	1.3	53.0	13.8	20.7	51.5	47.1	9.2	39.1	60.8	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.6	24.9	1.3	53.0	13.8	20.7	51.5	47.1	9.2	39.1	60.8	4.7
LOS	D	C	A	D	B	C	D	D	A	D	E	A
Approach Delay		24.9			18.7			42.8			49.5	
Approach LOS		C			B			D			D	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:EBT, Start of Yellow
 Natural Cycle: 105
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 36.0
 Intersection LOS: D
 Intersection Capacity Utilization 85.0%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)

























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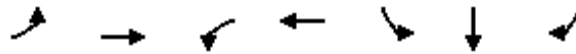
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	111	181	60	43	110	622	383	736	190	8	499	124
Future Volume (vph)	111	181	60	43	110	622	383	736	190	8	499	124
Ideal Flow (vphpl)	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lane Util. Factor	1.00	0.95	1.00	0.97	0.91	0.91	0.91	0.91	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	0.99	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.89	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600	1384	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600	1384	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	113	185	61	44	112	635	391	751	194	8	509	127
RTOR Reduction (vph)	0	0	23	0	277	47	0	0	120	0	0	106
Lane Group Flow (vph)	113	185	38	44	153	270	352	790	74	8	509	21
Confl. Peds. (#/hr)			2			1						
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	30.0	39.1	68.1	5.0	14.1	32.1	29.0	29.0	29.0	18.0	18.0	18.0
Effective Green, g (s)	30.0	39.1	68.1	5.0	14.1	32.1	29.0	29.0	29.0	18.0	18.0	18.0
Actuated g/C Ratio	0.27	0.36	0.62	0.05	0.13	0.29	0.26	0.26	0.26	0.16	0.16	0.16
Clearance Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	463	1279	1114	145	461	403	448	949	474	278	589	294
v/s Ratio Prot	c0.07	0.05	0.01	0.01	0.04	c0.11	0.21	c0.22		0.00	c0.14	
v/s Ratio Perm			0.01			0.09			0.04			0.01
v/c Ratio	0.24	0.14	0.03	0.30	0.33	0.67	0.79	0.83	0.16	0.03	0.86	0.07
Uniform Delay, d1	31.2	24.1	8.2	50.8	43.7	34.3	37.6	38.2	31.1	38.7	44.8	38.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.2	0.1	0.4	0.4	4.3	13.0	8.5	0.7	0.2	15.5	0.5
Delay (s)	31.3	24.3	8.2	51.2	44.1	38.6	50.6	46.7	31.8	38.8	60.3	39.4
Level of Service	C	C	A	D	D	D	D	D	C	D	E	D
Approach Delay (s)		23.8			42.3			45.6			55.9	
Approach LOS		C			D			D			E	

Intersection Summary		
HCM 2000 Control Delay	44.4	HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio	0.62	
Actuated Cycle Length (s)	110.0	Sum of lost time (s) 18.9
Intersection Capacity Utilization	85.0%	ICU Level of Service E
Analysis Period (min)	15	

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	181	60	43	110	622	383	736	190	8	499	124
Future Volume (veh/h)	111	181	60	43	110	622	383	736	190	8	499	124
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	113	185	44	44	112	623	381	765	154	8	509	109
Adj No. of Lanes	1	2	1	2	1	2	1	2	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	302	1256	957	102	378	1142	427	949	403	265	560	250
Arrive On Green	0.19	0.37	0.37	0.03	0.21	0.21	0.26	0.26	0.26	0.16	0.16	0.16
Sat Flow, veh/h	1619	3420	1508	3048	1800	3053	1619	3600	1530	1619	3420	1530
Grp Volume(v), veh/h	113	185	44	44	112	623	381	765	154	8	509	109
Grp Sat Flow(s),veh/h/ln	1619	1710	1508	1524	1800	1526	1619	1800	1530	1619	1710	1530
Q Serve(g_s), s	6.7	4.0	1.2	1.6	5.8	17.7	24.9	21.9	9.1	0.5	16.1	7.1
Cycle Q Clear(g_c), s	6.7	4.0	1.2	1.6	5.8	17.7	24.9	21.9	9.1	0.5	16.1	7.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	302	1256	957	102	378	1142	427	949	403	265	560	250
V/C Ratio(X)	0.37	0.15	0.05	0.43	0.30	0.55	0.89	0.81	0.38	0.03	0.91	0.44
Avail Cap(c_a), veh/h	302	1256	957	202	568	1464	427	949	403	265	560	250
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.2	23.3	7.7	52.1	36.6	27.1	39.0	37.9	33.2	38.7	45.2	41.4
Incr Delay (d2), s/veh	0.3	0.2	0.1	1.1	0.4	0.4	23.6	7.3	2.7	0.2	21.2	5.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	1.9	0.9	0.7	2.9	9.4	13.9	11.8	4.1	0.2	9.2	3.3
LnGrp Delay(d),s/veh	39.4	23.5	7.8	53.2	37.0	27.5	62.6	45.1	35.9	38.9	66.4	46.9
LnGrp LOS	D	C	A	D	D	C	E	D	D	D	E	D
Approach Vol, veh/h		342			779			1300			626	
Approach Delay, s/veh		26.7			30.3			49.2			62.7	
Approach LOS		C			C			D			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.3	45.5		22.6	25.6	28.2		33.6				
Change Period (Y+Rc), s	4.6	5.1		4.6	5.1	* 5.1		4.6				
Max Green Setting (Gmax), s	7.3	36.8		18.0	9.4	* 35		29.0				
Max Q Clear Time (g_c+I1), s	3.6	6.0		18.1	8.7	19.7		26.9				
Green Ext Time (p_c), s	0.0	1.4		0.0	0.1	2.9		1.3				
Intersection Summary												
HCM 2010 Ctrl Delay			44.6									
HCM 2010 LOS			D									
Notes												

Timings
1: I-215 SB Ramps & Auto Center Rd.

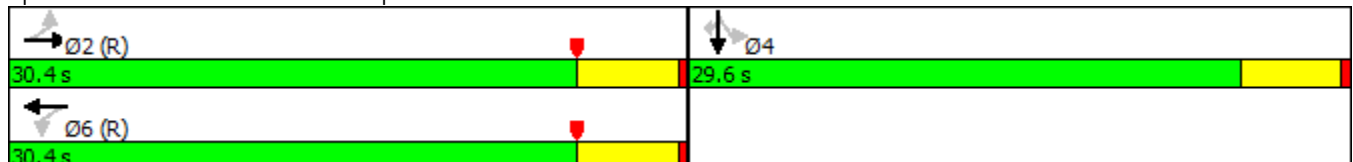


Lane Group	EBL	EBT	WBL	WBT	SBL	SBT	SBR
Lane Configurations		↑↑		↑↑	↘	↙	↗
Traffic Volume (vph)	6	467	8	428	620	104	276
Future Volume (vph)	6	467	8	428	620	104	276
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases		2		6		4	
Permitted Phases	2		6		4		4
Detector Phase	2	2	6	6	4	4	4
Switch Phase							
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	30.0	30.0	22.5	22.5	22.5	22.5	22.5
Total Split (s)	30.4	30.4	30.4	30.4	29.6	29.6	29.6
Total Split (%)	50.7%	50.7%	50.7%	50.7%	49.3%	49.3%	49.3%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)		5.0		5.0	5.0	5.0	5.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Max	C-Max	C-Max	C-Max	Max	Max	Max
Act Effect Green (s)		25.4		25.4	24.6	24.6	24.6
Actuated g/C Ratio		0.42		0.42	0.41	0.41	0.41
v/c Ratio		0.43		0.30	0.54	0.51	0.32
Control Delay		11.0		6.3	17.0	16.3	3.1
Queue Delay		0.0		0.0	0.0	0.0	0.0
Total Delay		11.0		6.3	17.0	16.3	3.1
LOS		B		A	B	B	A
Approach Delay		11.0		6.3		12.9	
Approach LOS		B		A		B	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 50 (83%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.54
 Intersection Signal Delay: 10.9
 Intersection Capacity Utilization 53.7%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 1: I-215 SB Ramps & Auto Center Rd.



HCM Signalized Intersection Capacity Analysis
1: I-215 SB Ramps & Auto Center Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017




















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑↑			↑↑					↖	↗	↘	
Traffic Volume (vph)	6	467	179	8	428	0	0	0	0	620	104	276	
Future Volume (vph)	6	467	179	8	428	0	0	0	0	620	104	276	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1700	1800	1800	
Total Lost time (s)		5.0			5.0					5.0	5.0	5.0	
Lane Util. Factor		0.95			0.95					0.95	0.95	1.00	
Frbp, ped/bikes		0.99			1.00					1.00	1.00	1.00	
Flpb, ped/bikes		1.00			1.00					1.00	1.00	1.00	
Frt		0.96			1.00					1.00	1.00	0.85	
Flt Protected		1.00			1.00					0.95	0.97	1.00	
Satd. Flow (prot)		3600			3600					1700	1800	1800	
Flt Permitted		0.95			0.94					0.95	0.97	1.00	
Satd. Flow (perm)		3600			3600					1700	1800	1800	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	6	486	186	8	446	0	0	0	0	646	108	288	
RTOR Reduction (vph)	0	65	0	0	0	0	0	0	0	0	0	163	
Lane Group Flow (vph)	0	613	0	0	454	0	0	0	0	375	379	125	
Confl. Peds. (#/hr)			1										
Confl. Bikes (#/hr)			1										
Turn Type	Perm	NA		Perm	NA					Perm	NA	Perm	
Protected Phases		2			6						4		
Permitted Phases	2			6						4		4	
Actuated Green, G (s)		25.4			25.4					24.6	24.6	24.6	
Effective Green, g (s)		25.4			25.4					24.6	24.6	24.6	
Actuated g/C Ratio		0.42			0.42					0.41	0.41	0.41	
Clearance Time (s)		5.0			5.0					5.0	5.0	5.0	
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0	
Lane Grp Cap (vph)		1524			1524					697	738	738	
v/s Ratio Prot													
v/s Ratio Perm		0.17			0.13					0.22	0.21	0.07	
v/c Ratio		0.40			0.30					0.54	0.51	0.17	
Uniform Delay, d1		12.0			11.4					13.4	13.2	11.2	
Progression Factor		1.00			0.52					1.00	1.00	1.00	
Incremental Delay, d2		0.8			0.4					3.0	2.5	0.5	
Delay (s)		12.8			6.3					16.4	15.8	11.7	
Level of Service		B			A					B	B	B	
Approach Delay (s)		12.8			6.3			0.0			14.9		
Approach LOS		B			A			A			B		
Intersection Summary													
HCM 2000 Control Delay			12.4									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.47										
Actuated Cycle Length (s)			60.0									Sum of lost time (s)	10.0
Intersection Capacity Utilization			53.7%									ICU Level of Service	A
Analysis Period (min)			15										
c Critical Lane Group													

HCM 2010 Signalized Intersection Summary
1: I-215 SB Ramps & Auto Center Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	467	179	8	428	0	0	0	0	620	104	276
Future Volume (veh/h)	6	467	179	8	428	0	0	0	0	620	104	276
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1800	1800	1800	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	6	486	135	8	446	0				723	0	167
Adj No. of Lanes	0	2	0	0	2	0				2	0	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	64	1091	298	68	1407	0				1328	0	627
Arrive On Green	0.42	0.42	0.42	0.85	0.85	0.00				0.41	0.00	0.41
Sat Flow, veh/h	7	2577	705	15	3404	0				3238	0	1530
Grp Volume(v), veh/h	341	0	286	243	211	0				723	0	167
Grp Sat Flow(s),veh/h/ln	1794	0	1495	1782	1556	0				1619	0	1530
Q Serve(g_s), s	0.0	0.0	8.2	0.0	1.7	0.0				10.2	0.0	4.3
Cycle Q Clear(g_c), s	8.1	0.0	8.2	1.7	1.7	0.0				10.2	0.0	4.3
Prop In Lane	0.02		0.47	0.03		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	820	0	633	816	659	0				1328	0	627
V/C Ratio(X)	0.42	0.00	0.45	0.30	0.32	0.00				0.54	0.00	0.27
Avail Cap(c_a), veh/h	820	0	633	816	659	0				1328	0	627
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	12.3	0.0	12.3	2.8	2.8	0.0				13.4	0.0	11.7
Incr Delay (d2), s/veh	1.5	0.0	2.3	0.9	1.3	0.0				1.6	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	0.0	3.8	0.9	0.8	0.0				4.8	0.0	2.0
LnGrp Delay(d),s/veh	13.9	0.0	14.7	3.7	4.1	0.0				15.1	0.0	12.8
LnGrp LOS	B		B	A	A					B		B
Approach Vol, veh/h		627			454						890	
Approach Delay, s/veh		14.2			3.9						14.6	
Approach LOS		B			A						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		30.4		29.6		30.4						
Change Period (Y+Rc), s		5.0		5.0		5.0						
Max Green Setting (Gmax), s		25.4		24.6		25.4						
Max Q Clear Time (g_c+I1), s		10.2		12.2		3.7						
Green Ext Time (p_c), s		5.6		2.7		6.5						
Intersection Summary												
HCM 2010 Ctrl Delay			12.0									
HCM 2010 LOS			B									
Notes												

Timings

2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.

3/27/2017

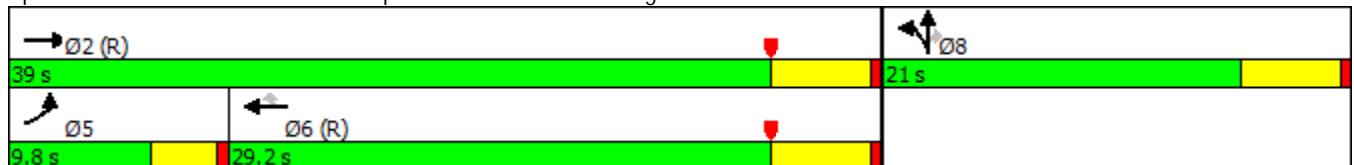


Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations	↶	↷↷	↷↷	↷	↶	↷	↷↷
Traffic Volume (vph)	230	853	1096	743	122	7	1086
Future Volume (vph)	230	853	1096	743	122	7	1086
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm
Protected Phases	5	2	6		8	8	
Permitted Phases				6			8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	8.0	8.0	8.0	5.0	5.0	5.0
Minimum Split (s)	8.5	39.0	13.0	13.0	10.0	10.0	10.0
Total Split (s)	9.8	39.0	29.2	29.2	21.0	21.0	21.0
Total Split (%)	16.3%	65.0%	48.7%	48.7%	35.0%	35.0%	35.0%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max
Act Effct Green (s)	6.3	34.0	24.2	24.2	16.0	16.0	16.0
Actuated g/C Ratio	0.10	0.57	0.40	0.40	0.27	0.27	0.27
v/c Ratio	1.32	0.43	0.77	0.64	0.15	0.14	0.97
Control Delay	201.5	5.2	14.4	4.6	17.9	17.7	39.0
Queue Delay	0.0	0.4	0.0	0.4	0.0	0.0	20.6
Total Delay	201.5	5.6	14.4	5.0	17.9	17.7	59.7
LOS	F	A	B	A	B	B	E
Approach Delay		47.2	10.6			55.2	
Approach LOS		D	B			E	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 43 (72%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.32
 Intersection Signal Delay: 33.3
 Intersection LOS: C
 Intersection Capacity Utilization 78.6%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.
























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↗	↗↗			
Traffic Volume (vph)	230	853	0	0	1096	743	122	7	1086	0	0	0
Future Volume (vph)	230	853	0	0	1096	743	122	7	1086	0	0	0
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800	1700	1800	1800	1800	1800	1800
Total Lost time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	0.88			
Frbp, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.96	1.00			
Satd. Flow (prot)	1700	3600			3600	1800	1700	1800	3600			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.96	1.00			
Satd. Flow (perm)	1700	3600			3600	1800	1700	1800	3600			
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	235	870	0	0	1118	758	124	7	1108	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	452	0	0	186	0	0	0
Lane Group Flow (vph)	235	870	0	0	1118	306	66	65	922	0	0	0
Confl. Peds. (#/hr)			1									
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	6.3	34.0			24.2	24.2	16.0	16.0	16.0			
Effective Green, g (s)	6.3	34.0			24.2	24.2	16.0	16.0	16.0			
Actuated g/C Ratio	0.10	0.57			0.40	0.40	0.27	0.27	0.27			
Clearance Time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Vehicle Extension (s)	2.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	178	2040			1452	726	453	480	960			
v/s Ratio Prot	c0.14	0.24			c0.31		0.04	0.04				
v/s Ratio Perm						0.17			c0.26			
v/c Ratio	1.32	0.43			0.77	0.42	0.15	0.14	0.96			
Uniform Delay, d1	26.9	7.4			15.5	12.9	16.8	16.7	21.7			
Progression Factor	0.88	0.61			0.83	4.04	1.00	1.00	1.00			
Incremental Delay, d2	174.7	0.6			1.4	0.6	0.7	0.6	21.0			
Delay (s)	198.2	5.1			14.3	52.6	17.5	17.3	42.7			
Level of Service	F	A			B	D	B	B	D			
Approach Delay (s)		46.2			29.8			40.0			0.0	
Approach LOS		D			C			D			A	

Intersection Summary

HCM 2000 Control Delay	37.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	853	0	0	1096	743	122	7	1086	0	0	0
Future Volume (veh/h)	230	853	0	0	1096	743	122	7	1086	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1700	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	235	870	0	0	1118	554	129	0	774			
Adj No. of Lanes	1	2	0	0	2	1	2	0	2			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	170	1938	0	0	1379	617	863	0	816			
Arrive On Green	0.11	0.57	0.00	0.00	0.40	0.40	0.27	0.00	0.27			
Sat Flow, veh/h	1619	3510	0	0	3510	1530	3238	0	3060			
Grp Volume(v), veh/h	235	870	0	0	1118	554	129	0	774			
Grp Sat Flow(s),veh/h/ln	1619	1710	0	0	1710	1530	1619	0	1530			
Q Serve(g_s), s	6.3	8.9	0.0	0.0	17.4	20.3	1.8	0.0	14.9			
Cycle Q Clear(g_c), s	6.3	8.9	0.0	0.0	17.4	20.3	1.8	0.0	14.9			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	170	1938	0	0	1379	617	863	0	816			
V/C Ratio(X)	1.38	0.45	0.00	0.00	0.81	0.90	0.15	0.00	0.95			
Avail Cap(c_a), veh/h	170	1938	0	0	1379	617	863	0	816			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.16	0.16	1.00	0.00	1.00			
Uniform Delay (d), s/veh	26.9	7.6	0.0	0.0	15.9	16.7	16.8	0.0	21.6			
Incr Delay (d2), s/veh	204.3	0.8	0.0	0.0	0.9	3.9	0.4	0.0	21.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	12.4	4.3	0.0	0.0	8.2	9.1	0.9	0.0	8.6			
LnGrp Delay(d),s/veh	231.1	8.3	0.0	0.0	16.8	20.6	17.2	0.0	42.8			
LnGrp LOS	F	A			B	C	B		D			
Approach Vol, veh/h		1105			1672			903				
Approach Delay, s/veh		55.7			18.1			39.1				
Approach LOS		E			B			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		39.0			9.8	29.2		21.0				
Change Period (Y+Rc), s		5.0			3.5	5.0		5.0				
Max Green Setting (Gmax), s		34.0			6.3	24.2		16.0				
Max Q Clear Time (g_c+I1), s		10.9			8.3	22.3		16.9				
Green Ext Time (p_c), s		16.9			0.0	1.7		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				34.5								
HCM 2010 LOS				C								
Notes												

Timings
3: E St. & Orange Show Rd.

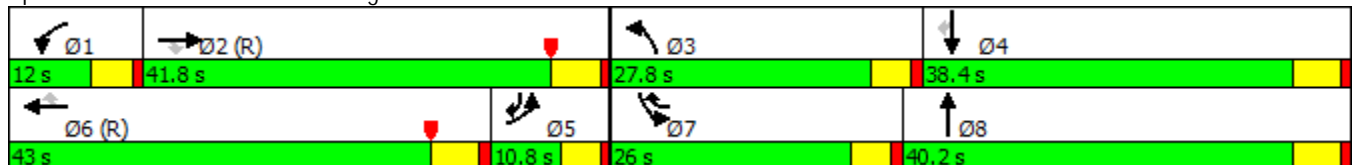


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑	↗	↔↔	↑↑	↗	↗	↕↕	↔↔	↑↑	↗
Traffic Volume (vph)	245	1281	362	158	1156	143	319	398	237	283	270
Future Volume (vph)	245	1281	362	158	1156	143	319	398	237	283	270
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8	7	4	5
Permitted Phases			2			6					4
Detector Phase	5	2	2	1	6	7	3	8	7	4	5
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0
Minimum Split (s)	9.6	39.4	39.4	9.6	39.4	9.6	9.6	38.4	9.6	38.4	9.6
Total Split (s)	10.8	41.8	41.8	12.0	43.0	26.0	27.8	40.2	26.0	38.4	10.8
Total Split (%)	9.0%	34.8%	34.8%	10.0%	35.8%	21.7%	23.2%	33.5%	21.7%	32.0%	9.0%
Yellow Time (s)	3.6	4.4	4.4	3.6	4.4	3.6	3.6	4.4	3.6	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4	4.6	5.4	4.6
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	Max	None	Max	None
Act Effct Green (s)	6.2	36.4	36.4	7.4	37.6	52.0	23.2	42.6	13.6	33.0	40.0
Actuated g/C Ratio	0.05	0.30	0.30	0.06	0.31	0.43	0.19	0.36	0.11	0.28	0.33
v/c Ratio	1.55	1.22	0.52	0.84	1.07	0.18	1.07	0.43	0.68	0.30	0.42
Control Delay	304.6	146.9	18.7	80.2	101.9	5.7	118.5	28.8	60.6	35.4	13.4
Queue Delay	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	304.6	146.9	18.8	80.2	101.9	5.7	118.5	28.8	60.6	35.4	13.4
LOS	F	F	B	F	F	A	F	C	E	D	B
Approach Delay		142.8			90.1			61.9		35.4	
Approach LOS		F			F			E		D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 108 (90%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.55
 Intersection Signal Delay: 96.5
 Intersection Capacity Utilization 107.9%
 Analysis Period (min) 15
 Intersection LOS: F
 ICU Level of Service G

Splits and Phases: 3: E St. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
3: E St. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

























3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	245	1281	362	158	1156	143	319	398	147	237	283	270
Future Volume (vph)	245	1281	362	158	1156	143	319	398	147	237	283	270
Ideal Flow (vphp)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Total Lost time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95		0.97	0.95	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3200	3600	1800	3200	3600	1800	1600	3600		3200	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3200	3600	1800	3200	3600	1800	1600	3600		3200	3600	1800
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	255	1334	377	165	1204	149	332	415	153	247	295	281
RTOR Reduction (vph)	0	0	177	0	0	41	0	28	0	0	0	71
Lane Group Flow (vph)	255	1334	200	165	1204	108	332	540	0	247	295	210
Confl. Peds. (#/hr)									2			2
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	6.2	36.4	36.4	7.4	37.6	51.2	23.2	42.6		13.6	33.0	39.2
Effective Green, g (s)	6.2	36.4	36.4	7.4	37.6	51.2	23.2	42.6		13.6	33.0	39.2
Actuated g/C Ratio	0.05	0.30	0.30	0.06	0.31	0.43	0.19	0.36		0.11	0.28	0.33
Clearance Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	2.0	2.0	3.0		2.0	3.0	2.0
Lane Grp Cap (vph)	165	1092	546	197	1128	768	309	1278		362	990	588
v/s Ratio Prot	0.08	c0.37		0.05	c0.33	0.02	c0.21	c0.15		0.08	0.08	0.02
v/s Ratio Perm			0.11			0.04						0.10
v/c Ratio	1.55	1.22	0.37	0.84	1.07	0.14	1.07	0.42		0.68	0.30	0.36
Uniform Delay, d1	56.9	41.8	32.8	55.7	41.2	21.0	48.4	29.4		51.1	34.4	30.8
Progression Factor	1.11	1.16	1.53	1.13	1.66	0.82	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	264.6	105.5	1.3	12.7	39.2	0.0	72.4	1.0		4.2	0.8	0.1
Delay (s)	327.7	154.1	51.3	75.8	107.7	17.3	120.8	30.4		55.3	35.1	30.9
Level of Service	F	F	D	E	F	B	F	C		E	D	C
Approach Delay (s)		156.9			95.4			63.7			39.8	
Approach LOS		F			F			E			D	

Intersection Summary

HCM 2000 Control Delay	104.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	107.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	245	1281	362	158	1156	143	319	398	147	237	283	270
Future Volume (veh/h)	245	1281	362	158	1156	143	319	398	147	237	283	270
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	255	1334	201	165	1204	93	332	415	122	247	295	174
Adj No. of Lanes	2	2	1	2	2	1	1	2	0	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	803	1813	811	182	1072	634	295	960	279	299	940	835
Arrive On Green	0.54	1.00	1.00	0.02	0.10	0.10	0.19	0.37	0.37	0.10	0.28	0.28
Sat Flow, veh/h	2956	3420	1530	2956	3420	1530	1524	2614	761	2956	3420	1527
Grp Volume(v), veh/h	255	1334	201	165	1204	93	332	270	267	247	295	174
Grp Sat Flow(s),veh/h/ln	1478	1710	1530	1478	1710	1530	1524	1710	1664	1478	1710	1527
Q Serve(g_s), s	5.7	0.0	0.0	6.7	37.6	4.0	23.2	14.2	14.5	9.8	8.2	3.6
Cycle Q Clear(g_c), s	5.7	0.0	0.0	6.7	37.6	4.0	23.2	14.2	14.5	9.8	8.2	3.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.46	1.00		1.00
Lane Grp Cap(c), veh/h	803	1813	811	182	1072	634	295	628	611	299	941	835
V/C Ratio(X)	0.32	0.74	0.25	0.91	1.12	0.15	1.13	0.43	0.44	0.83	0.31	0.21
Avail Cap(c_a), veh/h	803	1813	811	182	1072	634	295	628	611	527	941	835
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.61	0.61	0.61	0.36	0.36	0.36	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.3	0.0	0.0	58.4	53.8	22.9	48.4	28.5	28.6	52.9	34.5	12.3
Incr Delay (d2), s/veh	0.1	1.7	0.4	19.3	60.7	0.2	91.1	2.1	2.3	2.2	0.9	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.4	0.1	3.2	26.8	1.7	17.2	7.1	7.1	4.1	4.0	2.5
LnGrp Delay(d),s/veh	21.3	1.7	0.4	77.8	114.5	23.1	139.5	30.7	30.9	55.1	35.4	12.9
LnGrp LOS	C	A	A	E	F	C	F	C	C	E	D	B
Approach Vol, veh/h		1790			1462			869			716	
Approach Delay, s/veh		4.3			104.5			72.3			36.7	
Approach LOS		A			F			E			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.0	69.8	27.8	38.4	38.8	43.0	16.7	49.5				
Change Period (Y+Rc), s	4.6	5.4	4.6	5.4	5.4	* 5.4	4.6	5.4				
Max Green Setting (Gmax), s	7.4	36.4	23.2	33.0	6.2	* 38	21.4	34.8				
Max Q Clear Time (g_c+I1), s	8.7	2.0	25.2	10.2	7.7	39.6	11.8	16.5				
Green Ext Time (p_c), s	0.0	19.2	0.0	5.7	0.0	0.0	0.3	5.3				
Intersection Summary												
HCM 2010 Ctrl Delay			51.6									
HCM 2010 LOS			D									
Notes												

Timings
4: Arrowhead Av. & Orange Show Rd.

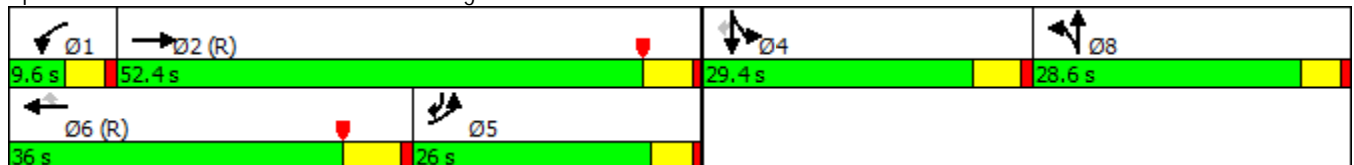


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖	↗	↖	↗	↗
Traffic Volume (vph)	300	1147	10	885	162	21	9	207	3	599
Future Volume (vph)	300	1147	10	885	162	21	9	207	3	599
Turn Type	Prot	NA	Prot	NA	Perm	Split	NA	Split	NA	pm+ov
Protected Phases	5	2	1	6		8	8	4	4	5
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	8	8	4	4	5
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	28.4	9.6	29.2	29.2	28.6	28.6	29.4	29.4	9.6
Total Split (s)	26.0	52.4	9.6	36.0	36.0	28.6	28.6	29.4	29.4	26.0
Total Split (%)	21.7%	43.7%	8.0%	30.0%	30.0%	23.8%	23.8%	24.5%	24.5%	21.7%
Yellow Time (s)	3.6	4.4	3.6	5.2	5.2	3.6	3.6	4.4	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	6.2	6.2	4.6	4.6	5.4	5.4	4.6
Lead/Lag	Lag	Lag	Lead	Lead	Lead					Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	C-Max	None	C-Max	C-Max	Max	Max	Max	Max	None
Act Effect Green (s)	21.4	54.7	5.0	29.8	29.8	24.0	24.0	24.0	24.0	50.8
Actuated g/C Ratio	0.18	0.46	0.04	0.25	0.25	0.20	0.20	0.20	0.20	0.42
v/c Ratio	1.07	0.75	0.16	1.06	0.31	0.07	0.13	0.34	0.31	0.63
Control Delay	65.5	13.4	60.7	92.2	9.5	39.7	16.3	44.4	43.8	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.5	13.4	60.7	92.2	9.5	39.7	16.3	44.4	43.8	9.9
LOS	E	B	E	F	A	D	B	D	D	A
Approach Delay		24.2		79.3			23.6		18.8	
Approach LOS		C		E			C		B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 114.4 (95%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.07
 Intersection Signal Delay: 40.1
 Intersection Capacity Utilization 100.0%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service F

Splits and Phases: 4: Arrowhead Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
4: Arrowhead Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)























3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	300	1147	4	10	885	162	21	9	38	207	3	599
Future Volume (vph)	300	1147	4	10	885	162	21	9	38	207	3	599
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	6.2	6.2	4.6	4.6		5.4	5.4	4.6
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		0.95	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	0.97		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.88		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00
Satd. Flow (prot)	1700	3600		1700	3600	1800	1700	1800		1700	1800	1800
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00
Satd. Flow (perm)	1700	3600		1700	3600	1800	1700	1800		1700	1800	1800
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	323	1233	4	11	952	174	23	10	41	223	3	644
RTOR Reduction (vph)	0	0	0	0	0	119	0	33	0	0	0	274
Lane Group Flow (vph)	323	1237	0	11	952	55	23	18	0	114	112	370
Confl. Peds. (#/hr)									15			23
Confl. Bikes (#/hr)												1
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		8	8		4	4	5
Permitted Phases						6						4
Actuated Green, G (s)	25.1	51.0		1.0	26.1	26.1	24.0	24.0		24.0	24.0	49.1
Effective Green, g (s)	25.1	51.0		1.0	26.1	26.1	24.0	24.0		24.0	24.0	49.1
Actuated g/C Ratio	0.21	0.42		0.01	0.22	0.22	0.20	0.20		0.20	0.20	0.41
Clearance Time (s)	4.6	5.4		4.6	6.2	6.2	4.6	4.6		5.4	5.4	4.6
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	3.0	3.0		3.0	3.0	2.0
Lane Grp Cap (vph)	355	1530		14	783	391	340	360		340	360	805
v/s Ratio Prot	c0.19	0.34		0.01	c0.26		c0.01	0.01		0.07	0.06	c0.10
v/s Ratio Perm						0.03						0.11
v/c Ratio	0.91	0.81		0.79	1.22	0.14	0.07	0.05		0.34	0.31	0.46
Uniform Delay, d1	46.3	30.2		59.4	46.9	37.9	38.9	38.8		41.2	40.9	25.8
Progression Factor	0.53	0.45		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.5	0.4		123.8	108.7	0.8	0.4	0.3		2.6	2.2	0.2
Delay (s)	27.9	14.1		183.2	155.6	38.7	39.3	39.1		43.8	43.2	26.0
Level of Service	C	B		F	F	D	D	D		D	D	C
Approach Delay (s)		17.0			138.0			39.1			30.5	
Approach LOS		B			F			D			C	

Intersection Summary		
HCM 2000 Control Delay	58.5	HCM 2000 Level of Service E
HCM 2000 Volume to Capacity ratio	0.69	
Actuated Cycle Length (s)	120.0	Sum of lost time (s) 20.8
Intersection Capacity Utilization	100.0%	ICU Level of Service F
Analysis Period (min)	15	

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	300	1147	4	10	885	162	21	9	38	207	3	599
Future Volume (veh/h)	300	1147	4	10	885	162	21	9	38	207	3	599
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	323	1233	4	11	952	122	23	10	26	225	0	575
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	435	1809	6	21	849	380	324	87	227	648	0	702
Arrive On Green	0.54	1.00	1.00	0.01	0.25	0.25	0.20	0.20	0.20	0.20	0.00	0.20
Sat Flow, veh/h	1619	3497	11	1619	3420	1530	1619	436	1133	3238	0	1458
Grp Volume(v), veh/h	323	603	634	11	952	122	23	0	36	225	0	575
Grp Sat Flow(s),veh/h/ln	1619	1710	1798	1619	1710	1530	1619	0	1569	1619	0	1458
Q Serve(g_s), s	18.4	0.0	0.0	0.8	29.8	7.8	1.4	0.0	2.3	7.2	0.0	6.7
Cycle Q Clear(g_c), s	18.4	0.0	0.0	0.8	29.8	7.8	1.4	0.0	2.3	7.2	0.0	6.7
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.72	1.00		1.00
Lane Grp Cap(c), veh/h	435	885	930	21	849	380	324	0	314	648	0	702
V/C Ratio(X)	0.74	0.68	0.68	0.53	1.12	0.32	0.07	0.00	0.11	0.35	0.00	0.82
Avail Cap(c_a), veh/h	435	885	930	67	849	380	324	0	314	648	0	702
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.6	0.0	0.0	58.9	45.1	36.8	39.0	0.0	39.3	41.3	0.0	27.2
Incr Delay (d2), s/veh	0.6	0.4	0.4	7.6	69.7	2.2	0.4	0.0	0.7	1.5	0.0	10.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	0.1	0.1	0.4	22.3	3.5	0.7	0.0	1.0	3.4	0.0	4.6
LnGrp Delay(d),s/veh	25.2	0.4	0.4	66.5	114.8	39.1	39.4	0.0	40.0	42.7	0.0	37.5
LnGrp LOS	C	A	A	E	F	D	D		D	D		D
Approach Vol, veh/h		1560			1085			59			800	
Approach Delay, s/veh		5.5			105.8			39.8			38.9	
Approach LOS		A			F			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.1	67.5		29.4	37.6	36.0		28.6				
Change Period (Y+Rc), s	4.6	5.4		5.4	5.4	* 6.2		4.6				
Max Green Setting (Gmax), s	5.0	47.0		24.0	21.4	* 30		24.0				
Max Q Clear Time (g_c+I1), s	2.8	2.0		9.2	20.4	31.8		4.3				
Green Ext Time (p_c), s	0.0	16.1		2.8	0.2	0.0		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			44.8									
HCM 2010 LOS			D									
Notes												

Timings

5: Washington Av./Washington Av. & Orange Show Rd.

3/27/2017

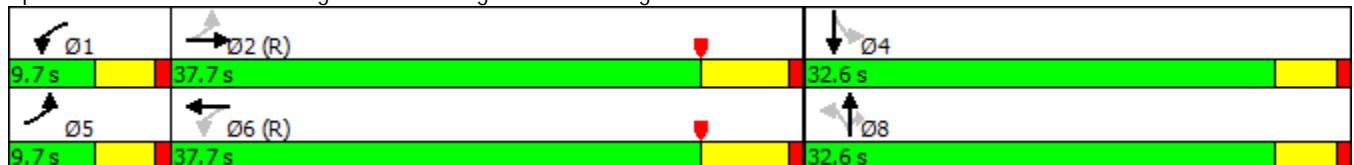


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↕	↖	↕		↕	↗		↕
Traffic Volume (vph)	34	1365	4	985	60	4	5	11	2
Future Volume (vph)	34	1365	4	985	60	4	5	11	2
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	Perm	NA
Protected Phases	5	2	1	6		8			4
Permitted Phases	2		6		8		8	4	
Detector Phase	5	2	1	6	8	8	8	4	4
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	9.6	23.2	32.6	32.6	32.6	32.6	32.6
Total Split (s)	9.7	37.7	9.7	37.7	32.6	32.6	32.6	32.6	32.6
Total Split (%)	12.1%	47.1%	12.1%	47.1%	40.8%	40.8%	40.8%	40.8%	40.8%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6	4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None
Act Effect Green (s)	60.1	57.8	59.2	54.0		13.6	13.6		13.6
Actuated g/C Ratio	0.75	0.72	0.74	0.68		0.17	0.17		0.17
v/c Ratio	0.03	0.59	0.00	0.45		0.23	0.01		0.08
Control Delay	5.5	11.8	6.2	10.9		28.2	0.0		17.0
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Delay	5.5	11.8	6.2	10.9		28.2	0.0		17.0
LOS	A	B	A	B		C	A		B
Approach Delay		11.7		10.9		26.3			17.0
Approach LOS		B		B		C			B

Intersection Summary

Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.59
 Intersection Signal Delay: 11.8
 Intersection LOS: B
 Intersection Capacity Utilization 70.4%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 5: Washington Av./Washington Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 5: Washington Av./Washington Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017






















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	1365	31	4	985	15	60	4	5	11	2	11
Future Volume (vph)	34	1365	31	4	985	15	60	4	5	11	2	11
Ideal Flow (vphp)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2		4.6	6.2			4.6	4.6		4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85		0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.98	
Satd. Flow (prot)	1700	3600		1700	3600			1800	1800		1800	
Flt Permitted	0.21	1.00		0.12	1.00			0.72	1.00		0.87	
Satd. Flow (perm)	1700	3600		1700	3600			1800	1800		1800	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	37	1500	34	4	1082	16	66	4	5	12	2	12
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	4	0	10	0
Lane Group Flow (vph)	37	1533	0	4	1097	0	0	70	1	0	16	0
Confl. Bikes (#/hr)			1									1
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)	55.0	52.0		51.0	50.0			11.6	11.6		11.6	
Effective Green, g (s)	55.0	52.0		51.0	50.0			11.6	11.6		11.6	
Actuated g/C Ratio	0.69	0.65		0.64	0.62			0.14	0.14		0.14	
Clearance Time (s)	4.6	6.2		4.6	6.2			4.6	4.6		4.6	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	1168	2340		1083	2250			261	261		261	
v/s Ratio Prot	c0.00	c0.43		0.00	0.30							
v/s Ratio Perm	0.02			0.00				0.04	0.00		0.01	
v/c Ratio	0.03	0.66		0.00	0.49			0.27	0.00		0.06	
Uniform Delay, d1	4.6	8.5		6.6	8.1			30.4	29.3		29.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.0	1.4		0.0	0.8			0.6	0.0		0.1	
Delay (s)	4.6	10.0		6.6	8.9			31.0	29.3		29.6	
Level of Service	A	A		A	A			C	C		C	
Approach Delay (s)		9.9			8.8			30.9			29.6	
Approach LOS		A			A			C			C	

Intersection Summary		
HCM 2000 Control Delay	10.2	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.58	B
Actuated Cycle Length (s)	80.0	Sum of lost time (s)
Intersection Capacity Utilization	70.4%	15.4
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		C

HCM 2010 Signalized Intersection Summary
 5: Washington Av./Washington Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	1365	31	4	985	15	60	4	5	11	2	11
Future Volume (veh/h)	34	1365	31	4	985	15	60	4	5	11	2	11
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	37	1500	34	4	1082	16	66	4	4	12	2	2
Adj No. of Lanes	1	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	398	2372	54	246	2292	34	243	12	165	157	26	15
Arrive On Green	0.04	0.69	0.69	0.01	0.66	0.66	0.11	0.11	0.11	0.11	0.11	0.11
Sat Flow, veh/h	1619	3417	77	1619	3450	51	1435	112	1530	721	238	137
Grp Volume(v), veh/h	37	750	784	4	536	562	70	0	4	16	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1784	1619	1710	1791	1547	0	1530	1096	0	0
Q Serve(g_s), s	0.6	19.1	19.2	0.1	12.3	12.3	0.0	0.0	0.2	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.6	19.1	19.2	0.1	12.3	12.3	3.0	0.0	0.2	3.0	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.03	0.94		1.00	0.75		0.12
Lane Grp Cap(c), veh/h	398	1187	1239	246	1136	1190	255	0	165	197	0	0
V/C Ratio(X)	0.09	0.63	0.63	0.02	0.47	0.47	0.27	0.00	0.02	0.08	0.00	0.00
Avail Cap(c_a), veh/h	445	1187	1239	341	1136	1190	606	0	535	555	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.09	0.09	0.09	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	4.7	6.7	6.7	6.2	6.6	6.6	33.2	0.0	31.9	32.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	2.6	2.5	0.0	0.1	0.1	0.6	0.0	0.1	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	9.6	10.0	0.0	5.7	6.0	1.5	0.0	0.1	0.3	0.0	0.0
LnGrp Delay(d),s/veh	4.8	9.2	9.2	6.2	6.7	6.7	33.7	0.0	32.0	32.3	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C		C	C		
Approach Vol, veh/h		1571			1102			74			16	
Approach Delay, s/veh		9.1			6.7			33.6			32.3	
Approach LOS		A			A			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.0	61.7		13.2	7.4	59.4		13.2				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.1	31.5		28.0	5.1	31.5		28.0				
Max Q Clear Time (g_c+I1), s	2.1	21.2		5.0	2.6	14.3		5.0				
Green Ext Time (p_c), s	0.0	9.6		0.4	0.0	15.6		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay			8.9									
HCM 2010 LOS			A									

Intersection

Int Delay, s/veh 3.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	32	0	0	28	17	14
Future Vol, veh/h	32	0	0	28	17	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	35	0	0	30	18	15

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	56	26	34	0	-	0
Stage 1	26	-	-	-	-	-
Stage 2	30	-	-	-	-	-
Critical Hdwy	7.1	6.2	4.1	-	-	-
Critical Hdwy Stg 1	6.1	-	-	-	-	-
Critical Hdwy Stg 2	6.1	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	946	1056	1591	-	-	-
Stage 1	997	-	-	-	-	-
Stage 2	992	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	946	1056	1591	-	-	-
Mov Cap-2 Maneuver	946	-	-	-	-	-
Stage 1	997	-	-	-	-	-
Stage 2	992	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1591	-	946	-	-
HCM Lane V/C Ratio	-	-	0.037	-	-
HCM Control Delay (s)	0	-	9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection

Int Delay, s/veh 3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↔	
Traffic Vol, veh/h	0	0	0	0	0	32	0	0	0	22	0	0
Future Vol, veh/h	0	0	0	0	0	32	0	0	0	22	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	54	54	54	54	54	54	54	54	54	54	54	54
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	59	0	0	0	41	0	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	59	0	30
Stage 1	-	-	30
Stage 2	-	-	0
Critical Hdwy	4.1	-	6.4
Critical Hdwy Stg 1	-	-	5.4
Critical Hdwy Stg 2	-	-	5.4
Follow-up Hdwy	2.2	-	3.5
Pot Cap-1 Maneuver	1558	0	989
Stage 1	-	0	998
Stage 2	-	0	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1558	-	989
Mov Cap-2 Maneuver	-	-	989
Stage 1	-	-	998
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1558	-	-	-	989
HCM Lane V/C Ratio	-	-	-	-	0.041
HCM Control Delay (s)	0	-	-	-	8.8
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection

Int Delay, s/veh 6.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	0	3	29	0	32	0	17	14	0
Future Vol, veh/h	0	0	0	0	3	29	0	32	0	17	14	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	69	69	69	69	69	69	69	69	69	69	69	69
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	4	42	0	46	0	25	20	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	46	0	0	1	0	0	37	47	1	50	26	25
Stage 1	-	-	-	-	-	-	1	1	-	25	25	-
Stage 2	-	-	-	-	-	-	36	46	-	25	1	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1575	-	-	1635	-	-	973	849	1090	955	871	1057
Stage 1	-	-	-	-	-	-	1027	899	-	998	878	-
Stage 2	-	-	-	-	-	-	985	861	-	998	899	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1575	-	-	1635	-	-	956	849	1090	915	871	1057
Mov Cap-2 Maneuver	-	-	-	-	-	-	956	849	-	915	871	-
Stage 1	-	-	-	-	-	-	1027	899	-	998	878	-
Stage 2	-	-	-	-	-	-	962	861	-	947	899	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	9.5	9.2
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	849	1575	-	-	1635	-	-	895
HCM Lane V/C Ratio	0.055	-	-	-	-	-	-	0.05
HCM Control Delay (s)	9.5	0	-	-	0	-	-	9.2
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.2

Timings

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.

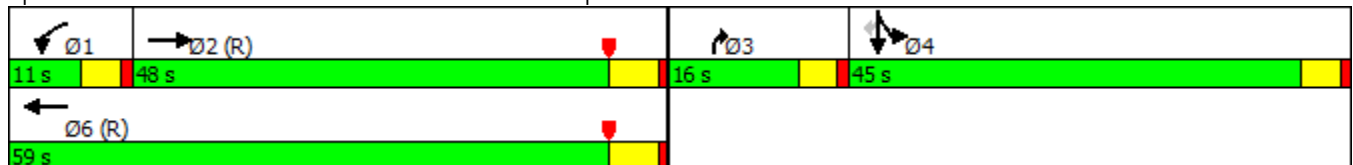


Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↖	↑↑	↗	↖	↗	↗
Traffic Volume (vph)	830	22	614	64	521	127	400
Future Volume (vph)	830	22	614	64	521	127	400
Turn Type	NA	Prot	NA	Prot	Split	NA	Perm
Protected Phases	2	1	6	3	4	4	
Permitted Phases							4
Detector Phase	2	1	6	3	4	4	4
Switch Phase							
Minimum Initial (s)	10.0	5.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	22.4	9.6	15.4	9.5	14.6	14.6	14.6
Total Split (s)	48.0	11.0	59.0	16.0	45.0	45.0	45.0
Total Split (%)	40.0%	9.2%	49.2%	13.3%	37.5%	37.5%	37.5%
Yellow Time (s)	4.4	3.6	4.4	3.5	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	4.6	5.4	4.5	4.6	4.6	4.6
Lead/Lag	Lag	Lead		Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes
Recall Mode	C-Max	None	C-Max	None	Max	Max	Max
Act Effct Green (s)	47.1	5.8	53.6	5.5	48.4	48.4	48.4
Actuated g/C Ratio	0.39	0.05	0.45	0.05	0.40	0.40	0.40
v/c Ratio	0.64	0.29	0.41	0.31	0.51	0.48	0.47
Control Delay	33.1	64.2	23.5	3.5	30.8	30.0	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.1	64.2	23.5	3.5	30.8	30.0	8.1
LOS	C	E	C	A	C	C	A
Approach Delay	33.1		24.9			21.9	
Approach LOS	C		C			C	

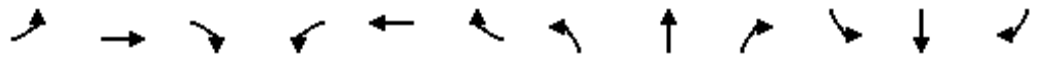
Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 11 (9%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.64
 Intersection Signal Delay: 25.8
 Intersection LOS: C
 Intersection Capacity Utilization 59.8%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.






















HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑				↗	↖	↑↑	↗
Traffic Volume (vph)	0	830	18	22	614	0	0	0	64	521	127	400
Future Volume (vph)	0	830	18	22	614	0	0	0	64	521	127	400
Ideal Flow (vphp)	1800	1800	1800	1700	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Lane Util. Factor		0.95		1.00	0.95				1.00	0.95	0.95	1.00
Frbp, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00		1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00				1.00	0.95	0.97	1.00
Satd. Flow (prot)		3600		1700	3600				1800	1700	1800	1800
Flt Permitted		1.00		0.95	1.00				1.00	0.95	0.97	1.00
Satd. Flow (perm)		3600		1700	3600				1800	1700	1800	1800
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	892	19	24	660	0	0	0	69	560	137	430
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	66	0	0	199
Lane Group Flow (vph)	0	910	0	24	660	0	0	0	3	347	350	231
Confl. Peds. (#/hr)			3			1						
Turn Type		NA		Prot	NA				Prot	Split	NA	Perm
Protected Phases		2		1	6				3	4	4	
Permitted Phases												4
Actuated Green, G (s)		44.3		3.8	52.7				4.4	48.4	48.4	48.4
Effective Green, g (s)		44.3		3.8	52.7				4.4	48.4	48.4	48.4
Actuated g/C Ratio		0.37		0.03	0.44				0.04	0.40	0.40	0.40
Clearance Time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Vehicle Extension (s)		3.0		2.0	3.0				3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1329		53	1581				66	685	726	726
v/s Ratio Prot		c0.25		0.01	c0.18				c0.00	c0.20	0.19	
v/s Ratio Perm												0.13
v/c Ratio		0.68		0.45	0.42				0.04	0.51	0.48	0.32
Uniform Delay, d1		32.0		57.1	23.1				55.8	26.8	26.5	24.5
Progression Factor		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		2.9		2.2	0.8				0.2	2.7	2.3	1.2
Delay (s)		34.8		59.3	23.9				56.0	29.5	28.8	25.7
Level of Service		C		E	C				E	C	C	C
Approach Delay (s)		34.8			25.2			56.0			27.8	
Approach LOS		C			C			E			C	

Intersection Summary			
HCM 2000 Control Delay	30.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.1
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	830	18	22	614	0	0	0	64	521	127	400
Future Volume (veh/h)	0	830	18	22	614	0	0	0	64	521	127	400
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	0	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	892	13	24	660	0	0	0	41	348	433	428
Adj No. of Lanes	0	2	0	1	2	0	0	0	1	1	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1790	26	37	1984	0	0	0	0	545	606	515
Arrive On Green	0.00	0.52	0.52	0.02	0.58	0.00	0.00	0.00	0.00	0.34	0.34	0.34
Sat Flow, veh/h	0	3541	50	1619	3510	0		0		1619	1800	1530
Grp Volume(v), veh/h	0	442	463	24	660	0		0.0		348	433	428
Grp Sat Flow(s),veh/h/ln	0	1710	1791	1619	1710	0				1619	1800	1530
Q Serve(g_s), s	0.0	20.1	20.1	1.8	12.1	0.0				21.8	25.2	30.9
Cycle Q Clear(g_c), s	0.0	20.1	20.1	1.8	12.1	0.0				21.8	25.2	30.9
Prop In Lane	0.00		0.03	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	887	929	37	1984	0				545	606	515
V/C Ratio(X)	0.00	0.50	0.50	0.65	0.33	0.00				0.64	0.71	0.83
Avail Cap(c_a), veh/h	0	887	929	86	1984	0				545	606	515
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.43	0.43	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	18.7	18.7	58.1	13.1	0.0				33.6	34.8	36.7
Incr Delay (d2), s/veh	0.0	2.0	1.9	3.0	0.2	0.0				5.6	7.0	14.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.9	10.4	0.8	5.7	0.0				10.6	13.7	15.1
LnGrp Delay(d),s/veh	0.0	20.7	20.7	61.1	13.3	0.0				39.3	41.8	51.1
LnGrp LOS		C	C	E	B					D	D	D
Approach Vol, veh/h		905			684						1209	
Approach Delay, s/veh		20.7			15.0						44.4	
Approach LOS		C			B						D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	7.4	67.6		45.0		75.0						
Change Period (Y+Rc), s	4.6	5.4		4.6		5.4						
Max Green Setting (Gmax), s	6.4	42.6		40.4		53.6						
Max Q Clear Time (g_c+I1), s	3.8	22.1		32.9		14.1						
Green Ext Time (p_c), s	0.0	10.0		3.2		13.0						
Intersection Summary												
HCM 2010 Ctrl Delay				29.5								
HCM 2010 LOS				C								
Notes												

Timings

Gateway South Building 4 TIA (JN 10187)

9: Waterman Av. & Orange Show Rd./Orange Show Rd.

3/28/2017

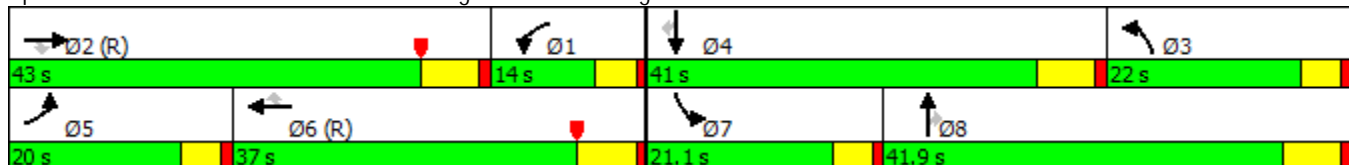


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑	↗	↘	↑↑	↗	↘	↑↑	↗
Traffic Volume (vph)	187	937	274	187	583	95	303	797	219	151	823	149
Future Volume (vph)	187	937	274	187	583	95	303	797	219	151	823	149
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.2	35.2	9.6	35.2	35.2	9.6	33.2	33.2	9.6	33.2	33.2
Total Split (s)	20.0	43.0	43.0	14.0	37.0	37.0	22.0	41.9	41.9	21.1	41.0	41.0
Total Split (%)	16.7%	35.8%	35.8%	11.7%	30.8%	30.8%	18.3%	34.9%	34.9%	17.6%	34.2%	34.2%
Yellow Time (s)	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Act Effect Green (s)	15.1	36.8	36.8	9.4	31.1	31.1	17.4	37.9	37.9	14.3	34.8	34.8
Actuated g/C Ratio	0.13	0.31	0.31	0.08	0.26	0.26	0.14	0.32	0.32	0.12	0.29	0.29
v/c Ratio	0.92	0.89	0.39	1.48	1.32	0.17	1.30	0.74	0.32	0.78	0.83	0.24
Control Delay	96.5	51.2	6.7	290.7	193.6	0.7	201.3	41.9	5.5	76.8	47.9	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	96.5	51.2	6.7	290.7	193.6	0.7	201.3	41.9	5.5	76.8	47.9	3.7
LOS	F	D	A	F	F	A	F	D	A	E	D	A
Approach Delay		48.6			193.4			72.4			45.9	
Approach LOS		D			F			E			D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 41.2 (34%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.48
 Intersection Signal Delay: 81.3
 Intersection LOS: F
 Intersection Capacity Utilization 104.7%
 ICU Level of Service G
 Analysis Period (min) 15

Splits and Phases: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/28/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	187	937	274	187	583	95	303	797	219	151	823	149
Future Volume (vph)	187	937	274	187	583	95	303	797	219	151	823	149
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	197	986	288	197	614	100	319	839	231	159	866	157
RTOR Reduction (vph)	0	0	183	0	0	74	0	0	156	0	0	111
Lane Group Flow (vph)	197	986	105	197	614	26	319	839	75	159	866	46
Confl. Peds. (#/hr)			1						1			
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	15.1	36.8	36.8	9.4	31.1	31.1	17.4	37.9	37.9	14.3	34.8	34.8
Effective Green, g (s)	15.1	36.8	36.8	9.4	31.1	31.1	17.4	37.9	37.9	14.3	34.8	34.8
Actuated g/C Ratio	0.13	0.31	0.31	0.08	0.26	0.26	0.14	0.32	0.32	0.12	0.29	0.29
Clearance Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	213	1104	552	133	466	466	246	1137	568	202	1044	522
v/s Ratio Prot	0.12	c0.27		c0.12	c0.34		c0.19	0.23		0.09	c0.24	
v/s Ratio Perm			0.06			0.01			0.04			0.03
v/c Ratio	0.92	0.89	0.19	1.48	1.32	0.06	1.30	0.74	0.13	0.79	0.83	0.09
Uniform Delay, d1	51.9	39.7	30.6	55.3	44.5	33.4	51.3	36.6	29.3	51.4	39.8	31.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	40.5	11.1	0.8	252.3	157.5	0.2	160.2	4.3	0.5	16.8	7.6	0.3
Delay (s)	92.4	50.8	31.4	307.6	201.9	33.6	211.5	40.9	29.8	68.2	47.5	31.4
Level of Service	F	D	C	F	F	C	F	D	C	E	D	C
Approach Delay (s)		52.6			206.3			78.2			48.1	
Approach LOS		D			F			E			D	

























Intersection Summary		
HCM 2000 Control Delay	87.0	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.10	F
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	104.7%	21.6
Analysis Period (min)	15	ICU Level of Service
		G

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/28/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	187	937	274	187	583	95	303	797	219	151	823	149
Future Volume (veh/h)	187	937	274	187	583	95	303	797	219	151	823	149
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	197	986	235	197	614	65	319	839	180	159	866	119
Adj No. of Lanes	1	2	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	208	1049	463	1293	1783	1515	235	1146	512	183	992	444
Arrive On Green	0.13	0.31	0.31	0.80	0.99	0.99	0.14	0.34	0.34	0.11	0.29	0.29
Sat Flow, veh/h	1619	3420	1509	1619	1800	1530	1619	3420	1529	1619	3420	1530
Grp Volume(v), veh/h	197	986	235	197	614	65	319	839	180	159	866	119
Grp Sat Flow(s),veh/h/ln	1619	1710	1509	1619	1800	1530	1619	1710	1529	1619	1710	1530
Q Serve(g_s), s	14.5	33.7	15.3	3.3	0.6	0.1	17.4	25.9	8.2	11.6	28.9	12.5
Cycle Q Clear(g_c), s	14.5	33.7	15.3	3.3	0.6	0.1	17.4	25.9	8.2	11.6	28.9	12.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	208	1049	463	1293	1783	1515	235	1146	512	183	992	444
V/C Ratio(X)	0.95	0.94	0.51	0.15	0.34	0.04	1.36	0.73	0.35	0.87	0.87	0.27
Avail Cap(c_a), veh/h	208	1049	463	1293	1783	1515	235	1146	512	223	992	444
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.78	0.78	0.78	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.9	40.5	34.2	2.8	0.0	0.0	51.3	35.1	17.7	52.3	40.5	99.8
Incr Delay (d2), s/veh	40.8	13.9	3.1	0.0	0.5	0.1	186.6	4.1	1.9	22.3	10.5	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.8	17.9	6.8	1.5	0.4	0.0	19.9	12.9	3.7	6.3	15.0	5.5
LnGrp Delay(d),s/veh	92.7	54.4	37.3	2.8	0.5	0.1	237.9	39.3	19.6	74.6	51.0	101.3
LnGrp LOS	F	D	D	A	A	A	F	D	B	E	D	F
Approach Vol, veh/h		1418			876			1338			1144	
Approach Delay, s/veh		56.9			1.0			84.0			59.6	
Approach LOS		E			A			F			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	103.7	43.0	23.6	41.0	20.0	126.7	18.2	46.4				
Change Period (Y+Rc), s	6.2	* 6.2	6.2	* 6.2	4.6	6.2	4.6	6.2				
Max Green Setting (Gmax), s	9.4	* 37	17.4	* 35	15.4	30.8	16.5	35.7				
Max Q Clear Time (g_c+I1), s	5.3	35.7	19.4	30.9	16.5	2.6	13.6	27.9				
Green Ext Time (p_c), s	2.0	0.8	0.0	2.0	0.0	6.0	0.1	3.7				
Intersection Summary												
HCM 2010 Ctrl Delay			54.9									
HCM 2010 LOS			D									
Notes												

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↕	↕
Traffic Vol, veh/h	2	18	13	1315	1247	8
Future Vol, veh/h	2	18	13	1315	1247	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	75	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	2	20	14	1429	1355	9

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	2103	682	1364 0
Stage 1	1360	-	- -
Stage 2	743	-	- -
Critical Hdwy	6.8	6.9	4.1 -
Critical Hdwy Stg 1	5.8	-	- -
Critical Hdwy Stg 2	5.8	-	- -
Follow-up Hdwy	3.5	3.3	2.2 -
Pot Cap-1 Maneuver	*45	*568	*852 -
Stage 1	*535	-	- -
Stage 2	*524	-	- -
Platoon blocked, %		1	1 -
Mov Cap-1 Maneuver	*44	*568	*852 -
Mov Cap-2 Maneuver	*260	-	- -
Stage 1	*535	-	- -
Stage 2	*516	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	12.3	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	* 852	-	260	568	-	-
HCM Lane V/C Ratio	0.017	-	0.008	0.034	-	-
HCM Control Delay (s)	9.3	-	19	11.6	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0	0.1	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Timings
11: Waterman Av. & Driveway 2/Park Center Dr.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↕		↕	↕	↕	↕↕	↕	↕	↕↕
Traffic Volume (vph)	53	0	106	0	36	36	1290	17	9	1431
Future Volume (vph)	53	0	106	0	36	36	1290	17	9	1431
Turn Type	Perm	NA	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4		8		5	2		1	6
Permitted Phases	4		8		8	2		2	6	
Detector Phase	4	4	8	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	21.6	21.6	21.6	9.6	23.2	23.2	9.6	33.2
Total Split (s)	21.6	21.6	21.6	21.6	21.6	9.6	33.8	33.8	9.6	33.8
Total Split (%)	33.2%	33.2%	33.2%	33.2%	33.2%	14.8%	52.0%	52.0%	14.8%	52.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		4.6	4.6	4.6	6.2	6.2	4.6	6.2
Lead/Lag						Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)		11.6		11.6	11.6	46.2	44.8	44.8	47.1	42.9
Actuated g/C Ratio		0.18		0.18	0.18	0.71	0.69	0.69	0.72	0.66
v/c Ratio		0.43		0.37	0.09	0.17	0.58	0.01	0.01	0.68
Control Delay		10.2		26.2	0.4	6.0	10.7	0.0	4.4	14.1
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		10.2		26.2	0.4	6.0	10.7	0.0	4.4	14.1
LOS		B		C	A	A	B	A	A	B
Approach Delay		10.2		19.7			10.4			14.1
Approach LOS		B		B			B			B

Intersection Summary

Cycle Length: 65
 Actuated Cycle Length: 65
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.68
 Intersection Signal Delay: 12.6
 Intersection LOS: B
 Intersection Capacity Utilization 67.4%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 11: Waterman Av. & Driveway 2/Park Center Dr.



HCM Signalized Intersection Capacity Analysis
 11: Waterman Av. & Driveway 2/Park Center Dr.

Gateway South Building 4 TIA (JN 10187)






















3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↕	↕	↕	↕↕	
Traffic Volume (vph)	53	0	82	106	0	36	36	1290	17	9	1431	22
Future Volume (vph)	53	0	82	106	0	36	36	1290	17	9	1431	22
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)		4.6			4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes		1.00			1.00	0.99	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.92			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1621			1800	1800	1615	3600	1800	1700	3600	
Flt Permitted		0.82			0.63	1.00	0.10	1.00	1.00	0.13	1.00	
Satd. Flow (perm)		1355			1800	1800	174	3600	1800	1700	3600	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	59	0	91	118	0	40	40	1433	19	10	1590	24
RTOR Reduction (vph)	0	112	0	0	0	34	0	0	8	0	1	0
Lane Group Flow (vph)	0	38	0	0	118	6	40	1433	11	10	1613	0
Confl. Peds. (#/hr)						1			1			1
Confl. Bikes (#/hr)									1			1
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		9.6			9.6	9.6	41.1	39.0	39.0	38.9	37.9	
Effective Green, g (s)		9.6			9.6	9.6	41.1	39.0	39.0	38.9	37.9	
Actuated g/C Ratio		0.15			0.15	0.15	0.63	0.60	0.60	0.60	0.58	
Clearance Time (s)		4.6			4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Vehicle Extension (s)		3.0			3.0	3.0	2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)		200			265	265	156	2160	1080	1017	2099	
v/s Ratio Prot							c0.01	0.40		0.00	c0.45	
v/s Ratio Perm		0.03			0.07	0.00	0.15		0.01	0.01		
v/c Ratio		0.19			0.45	0.02	0.26	0.66	0.01	0.01	0.77	
Uniform Delay, d1		24.3			25.3	23.7	7.7	8.6	5.2	6.3	10.2	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.5			1.2	0.0	0.3	1.6	0.0	0.0	2.8	
Delay (s)		24.8			26.5	23.7	8.0	10.3	5.3	6.3	13.0	
Level of Service		C			C	C	A	B	A	A	B	
Approach Delay (s)		24.8			25.8			10.1			13.0	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	15.4
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	0	82	106	0	36	36	1290	17	9	1431	22
Future Volume (veh/h)	53	0	82	106	0	36	36	1290	17	9	1431	22
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	59	0	79	118	0	27	40	1433	19	10	1590	24
Adj No. of Lanes	0	1	0	0	1	1	1	2	1	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	133	28	110	316	0	301	211	1893	829	213	1816	27
Arrive On Green	0.20	0.00	0.20	0.20	0.00	0.20	0.04	0.55	0.55	0.01	0.53	0.53
Sat Flow, veh/h	274	142	557	1045	0	1528	1619	3420	1497	1619	3448	52
Grp Volume(v), veh/h	138	0	0	118	0	27	40	1433	19	10	788	826
Grp Sat Flow(s),veh/h/ln	972	0	0	1045	0	1528	1619	1710	1497	1619	1710	1789
Q Serve(g_s), s	3.0	0.0	0.0	0.0	0.0	0.9	0.7	20.9	0.4	0.2	26.3	26.4
Cycle Q Clear(g_c), s	10.2	0.0	0.0	7.2	0.0	0.9	0.7	20.9	0.4	0.2	26.3	26.4
Prop In Lane	0.43		0.57	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	270	0	0	316	0	301	211	1893	829	213	901	943
V/C Ratio(X)	0.51	0.00	0.00	0.37	0.00	0.09	0.19	0.76	0.02	0.05	0.87	0.88
Avail Cap(c_a), veh/h	366	0	0	403	0	400	272	1893	829	317	901	943
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.0	0.0	0.0	23.9	0.0	21.3	12.4	11.1	6.6	9.8	13.5	13.5
Incr Delay (d2), s/veh	1.5	0.0	0.0	0.7	0.0	0.1	0.2	2.9	0.1	0.0	11.6	11.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	0.0	2.0	0.0	0.4	0.3	10.5	0.2	0.1	15.1	15.8
LnGrp Delay(d),s/veh	26.5	0.0	0.0	24.6	0.0	21.5	12.6	14.0	6.6	9.9	25.1	24.8
LnGrp LOS	C			C		C	B	B	A	A	C	C
Approach Vol, veh/h		138			145			1492			1624	
Approach Delay, s/veh		26.5			24.0			13.9			24.8	
Approach LOS		C			C			B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.4	42.2		17.4	7.2	40.4		17.4				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.0	27.6		17.0	5.0	27.6		17.0				
Max Q Clear Time (g_c+I1), s	2.2	22.9		12.2	2.7	28.4		9.2				
Green Ext Time (p_c), s	0.0	4.6		0.7	0.0	0.0		1.0				
Intersection Summary												
HCM 2010 Ctrl Delay			20.1									
HCM 2010 LOS			C									

Timings
12: Waterman Av./Waterman Av. & Hospitality Ln.

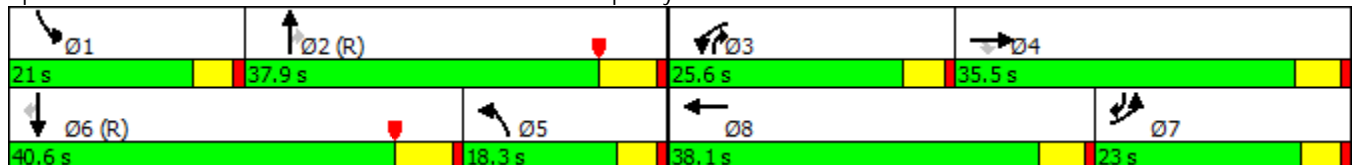


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↕	↗	↘↗	↕	↘↗	↕	↗↘	↘	↕↕↕	↗
Traffic Volume (vph)	173	394	573	427	463	282	600	748	246	1163	170
Future Volume (vph)	173	394	573	427	463	282	600	748	246	1163	170
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8	5	2	3	1	6	7
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	3	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	15.1	15.1	9.6	38.1	9.6	36.2	9.6	9.6	36.2	9.6
Total Split (s)	23.0	35.5	35.5	25.6	38.1	18.3	37.9	25.6	21.0	40.6	23.0
Total Split (%)	19.2%	29.6%	29.6%	21.3%	31.8%	15.3%	31.6%	21.3%	17.5%	33.8%	19.2%
Yellow Time (s)	3.6	4.1	4.1	3.6	4.1	3.6	5.2	3.6	3.6	5.2	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	5.1	4.6	5.1	4.6	6.2	4.6	4.6	6.2	4.6
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effect Green (s)	20.0	27.2	27.2	19.9	27.1	13.7	31.7	57.8	20.7	38.7	64.9
Actuated g/C Ratio	0.17	0.23	0.23	0.17	0.23	0.11	0.26	0.48	0.17	0.32	0.54
v/c Ratio	0.65	0.78	0.56	0.86	0.79	0.82	0.67	0.43	0.89	0.71	0.18
Control Delay	58.4	42.7	16.3	64.8	48.4	70.8	43.6	15.7	81.6	39.3	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.4	42.7	16.3	64.8	48.4	70.8	43.6	15.7	81.6	39.3	6.3
LOS	E	D	B	E	D	E	D	B	F	D	A
Approach Delay		38.1			55.0		35.5			42.4	
Approach LOS		D			E		D			D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 22 (18%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 115
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.89
 Intersection Signal Delay: 41.8
 Intersection LOS: D
 Intersection Capacity Utilization 89.7%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 12: Waterman Av./Waterman Av. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
 12: Waterman Av./Waterman Av. & Hospitality Ln.
























Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↗	↖↗	↖↗		↖↗	↖↗	↖↗	↖	↖↗↘	↖↗
Traffic Volume (vph)	173	394	573	427	463	163	282	600	748	246	1163	170
Future Volume (vph)	173	394	573	427	463	163	282	600	748	246	1163	170
Ideal Flow (vphpl)	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Lane Util. Factor	1.00	0.91	0.91	0.97	0.95		0.97	0.95	0.88	1.00	0.91	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.94	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Flt Permitted	1.00	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	184	419	610	454	493	173	300	638	796	262	1237	181
RTOR Reduction (vph)	0	88	172	0	31	0	0	0	108	0	0	60
Lane Group Flow (vph)	184	618	151	454	635	0	300	638	688	262	1237	121
Confl. Peds. (#/hr)						7			5			13
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4						2			6
Actuated Green, G (s)	20.0	27.2	27.2	19.9	27.1		13.7	31.7	51.6	20.7	38.7	58.7
Effective Green, g (s)	20.0	27.2	27.2	19.9	27.1		13.7	31.7	51.6	20.7	38.7	58.7
Actuated g/C Ratio	0.17	0.23	0.23	0.17	0.23		0.11	0.26	0.43	0.17	0.32	0.49
Clearance Time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	4.0	2.0	2.0	4.0	2.0
Lane Grp Cap (vph)	283	816	408	530	813		365	951	1548	293	1741	949
v/s Ratio Prot	0.11	c0.17		0.14	c0.18		c0.09	c0.18	0.07	c0.15	0.23	0.02
v/s Ratio Perm			0.08						0.12			0.05
v/c Ratio	0.65	0.76	0.37	0.86	0.78		0.82	0.67	0.44	0.89	0.71	0.13
Uniform Delay, d1	46.7	43.3	39.2	48.7	43.7		52.0	39.5	24.1	48.6	35.7	16.7
Progression Factor	1.00	1.00	1.00	1.02	1.02		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.0	4.0	0.6	11.6	4.6		13.2	3.8	0.1	26.7	2.5	0.0
Delay (s)	50.8	47.4	39.7	61.1	49.1		65.2	43.2	24.2	75.3	38.2	16.7
Level of Service	D	D	D	E	D		E	D	C	E	D	B
Approach Delay (s)		45.9			54.0			38.3			41.7	
Approach LOS		D			D			D			D	

Intersection Summary		
HCM 2000 Control Delay	43.9	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.79	D
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	89.7%	20.5
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		E

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	173	394	573	427	463	163	282	600	748	246	1163	170
Future Volume (veh/h)	173	394	573	427	463	163	282	600	748	246	1163	170
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	184	389	499	454	493	158	300	638	430	262	1237	111
Adj No. of Lanes	1	1	2	2	2	0	2	2	2	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	278	427	727	498	586	187	364	980	1219	221	1409	695
Arrive On Green	0.17	0.24	0.24	0.17	0.23	0.23	0.12	0.29	0.29	0.14	0.29	0.29
Sat Flow, veh/h	1619	1800	3060	2956	2547	811	2956	3420	2669	1619	4914	1509
Grp Volume(v), veh/h	184	389	499	454	330	321	300	638	430	262	1237	111
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	1710	1648	1478	1710	1335	1619	1638	1509
Q Serve(g_s), s	12.7	25.2	12.7	18.1	22.1	22.3	11.9	19.6	12.6	16.4	28.8	0.0
Cycle Q Clear(g_c), s	12.7	25.2	12.7	18.1	22.1	22.3	11.9	19.6	12.6	16.4	28.8	0.0
Prop In Lane	1.00		1.00	1.00		0.49	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	278	427	727	498	393	379	364	980	1219	221	1409	695
V/C Ratio(X)	0.66	0.91	0.69	0.91	0.84	0.85	0.82	0.65	0.35	1.18	0.88	0.16
Avail Cap(c_a), veh/h	278	456	775	517	470	453	364	980	1219	221	1409	695
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.82	0.82	0.82	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.4	44.5	21.3	49.0	44.1	44.2	51.3	37.5	21.2	51.8	40.8	19.0
Incr Delay (d2), s/veh	4.6	21.4	2.4	16.7	9.2	10.2	13.4	3.4	0.8	119.2	8.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	15.1	5.6	8.5	11.5	11.2	5.6	9.8	4.8	14.6	14.1	2.2
LnGrp Delay(d),s/veh	51.1	65.9	23.7	65.7	53.3	54.4	64.7	40.9	22.0	171.0	48.8	19.5
LnGrp LOS	D	E	C	E	D	D	E	D	C	F	D	B
Approach Vol, veh/h		1072			1105			1368			1610	
Approach Delay, s/veh		43.7			58.7			40.2			66.7	
Approach LOS		D			E			D			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	21.0	40.6	24.8	33.6	21.0	40.6	25.7	32.7				
Change Period (Y+Rc), s	4.6	6.2	4.6	5.1	6.2	* 6.2	5.1	* 5.1				
Max Green Setting (Gmax), s	16.4	31.7	21.0	30.4	13.7	* 34	18.4	* 33				
Max Q Clear Time (g_c+I1), s	18.4	21.6	20.1	27.2	13.9	30.8	14.7	24.3				
Green Ext Time (p_c), s	0.0	5.6	0.1	1.3	0.0	2.8	1.7	2.6				
Intersection Summary												
HCM 2010 Ctrl Delay			53.2									
HCM 2010 LOS			D									
Notes												

Intersection

Int Delay, s/veh 1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↘ ↗	↗	↗↗↗	
Traffic Vol, veh/h	0	0	406	1654	1551	737
Future Vol, veh/h	0	0	406	1654	1551	737
Conflicting Peds, #/hr	0	0	0	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	0	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	441	1798	1686	801

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	846	1689 0
Stage 1	-	-	- -
Stage 2	-	-	- -
Critical Hdwy	-	7.1	5.3 -
Critical Hdwy Stg 1	-	-	- -
Critical Hdwy Stg 2	-	-	- -
Follow-up Hdwy	-	3.9	3.1 -
Pot Cap-1 Maneuver	0	*572	*720 -
Stage 1	0	-	- -
Stage 2	0	-	- -
Platoon blocked, %	-	1	1 -
Mov Cap-1 Maneuver	-	*570	*720 -
Mov Cap-2 Maneuver	-	-	- -
Stage 1	-	-	- -
Stage 2	-	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	0	3.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	* 720	-	-	-	-
HCM Lane V/C Ratio	0.613	-	-	-	-
HCM Control Delay (s)	17.6	-	0	-	-
HCM Lane LOS	C	-	A	-	-
HCM 95th %tile Q(veh)	4.2	-	-	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection

Int Delay, s/veh 0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations						↗		↑↑			↑↑	
Traffic Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Future Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	-	-	-	Free	-	-	-	-	-	None
Storage Length	-	-	-	-	-	0	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	1197	0	988	0	0	739	169

Major/Minor

	Minor1	Major1	Major2
Conflicting Flow All	-	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	0	0	0
Stage 1	0	0	0
Stage 2	0	0	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	0	-
Mov Cap-2 Maneuver	-	0	-
Stage 1	-	0	-
Stage 2	-	0	-

Approach

	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt

	NBTWBLn1	SBT	SBR
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	-	0	-
HCM Lane LOS	-	A	-
HCM 95th %tile Q(veh)	-	-	-

Intersection

Int Delay, s/veh

Movement	NWL	NWR
Lane Configurations		
Traffic Vol, veh/h	0	0
Future Vol, veh/h	0	0
Conflicting Peds, #/hr	0	0
Sign Control	Stop	Stop
RT Channelized	-	-
Storage Length	-	-
Veh in Median Storage, #	0	-
Grade, %	0	-
Peak Hour Factor	96	96
Heavy Vehicles, %	0	0
Mvmt Flow	0	0

Major/Minor

Conflicting Flow All

Stage 1

Stage 2

Critical Hdwy

Critical Hdwy Stg 1

Critical Hdwy Stg 2

Follow-up Hdwy

Pot Cap-1 Maneuver

Stage 1

Stage 2

Platoon blocked, %

Mov Cap-1 Maneuver

Mov Cap-2 Maneuver

Stage 1

Stage 2

Approach

HCM Control Delay, s

HCM LOS

Minor Lane/Major Mvmt

Timings

15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.

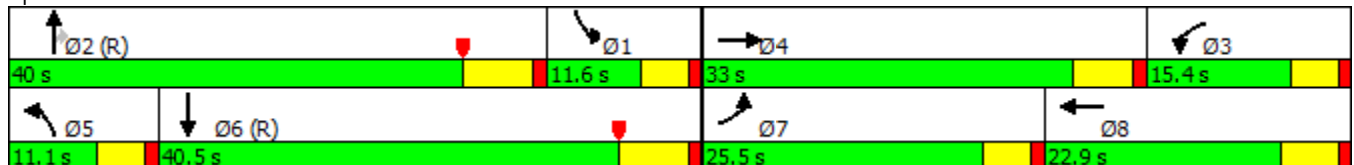


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖↗	↕	↖	↕	↖	↕	↗	↖	↕
Traffic Volume (vph)	644	692	175	369	56	989	86	217	633
Future Volume (vph)	644	692	175	369	56	989	86	217	633
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	9.6	31.4	9.6	15.4	9.6	36.2	36.2	9.6	36.2
Total Split (s)	25.5	33.0	15.4	22.9	11.1	40.0	40.0	11.6	40.5
Total Split (%)	25.5%	33.0%	15.4%	22.9%	11.1%	40.0%	40.0%	11.6%	40.5%
Yellow Time (s)	3.6	4.4	3.6	4.4	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	5.4	4.6	6.2	6.2	4.6	6.2
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)	20.9	27.1	11.3	17.5	6.2	33.8	33.8	7.0	36.5
Actuated g/C Ratio	0.21	0.27	0.11	0.18	0.06	0.34	0.34	0.07	0.36
v/c Ratio	1.03	0.91	0.97	0.87	0.57	0.87	0.12	1.94	0.67
Control Delay	81.4	48.9	105.5	48.1	67.1	39.9	0.3	480.1	28.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.4	48.9	105.5	48.1	67.1	39.9	0.3	480.1	28.7
LOS	F	D	F	D	E	D	A	F	C
Approach Delay		62.8		61.6		38.3			120.6
Approach LOS		E		E		D			F

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.94
 Intersection Signal Delay: 70.2
 Intersection LOS: E
 Intersection Capacity Utilization 99.1%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.

























HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔	↕↔		↔	↕↕	↔	↔	↕↔	
Traffic Volume (vph)	644	692	166	175	369	203	56	989	86	217	633	217
Future Volume (vph)	644	692	166	175	369	203	56	989	86	217	633	217
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.95		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	685	736	177	186	393	216	60	1052	91	231	673	231
RTOR Reduction (vph)	0	21	0	0	74	0	0	0	61	0	33	0
Lane Group Flow (vph)	685	892	0	186	535	0	60	1052	30	231	871	0
Confl. Peds. (#/hr)			3						1			6
Confl. Bikes (#/hr)			1						1			
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	20.9	27.1		11.3	17.5		5.2	32.9	32.9	7.9	35.6	
Effective Green, g (s)	20.9	27.1		11.3	17.5		5.2	32.9	32.9	7.9	35.6	
Actuated g/C Ratio	0.21	0.27		0.11	0.18		0.05	0.33	0.33	0.08	0.36	
Clearance Time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	668	975		192	630		88	1184	592	134	1281	
v/s Ratio Prot	c0.21	0.25		0.11	c0.15		0.04	c0.29		c0.14	0.24	
v/s Ratio Perm									0.02			
v/c Ratio	1.03	0.91		0.97	0.85		0.68	0.89	0.05	1.72	0.68	
Uniform Delay, d1	39.5	35.3		44.2	40.0		46.6	31.8	22.9	46.0	27.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	41.5	12.7		55.0	10.4		15.9	10.1	0.2	355.1	2.9	
Delay (s)	81.0	48.1		99.1	50.3		62.5	41.9	23.1	401.1	30.3	
Level of Service	F	D		F	D		E	D	C	F	C	
Approach Delay (s)		62.2			61.7			41.5			105.8	
Approach LOS		E			E			D			F	

Intersection Summary		
HCM 2000 Control Delay	67.3	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.00	E
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	99.1%	20.8
Analysis Period (min)	15	ICU Level of Service
		F

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	644	692	166	175	369	203	56	989	86	217	633	217
Future Volume (veh/h)	644	692	166	175	369	203	56	989	86	217	633	217
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	685	736	170	186	393	175	60	1052	60	231	673	170
Adj No. of Lanes	2	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	618	759	175	175	423	186	75	1156	510	1307	3017	762
Arrive On Green	0.21	0.28	0.28	0.11	0.18	0.18	0.05	0.34	0.34	0.81	1.00	1.00
Sat Flow, veh/h	2956	2751	635	1619	2313	1017	1619	3420	1509	1619	2705	683
Grp Volume(v), veh/h	685	458	448	186	289	279	60	1052	60	231	425	418
Grp Sat Flow(s),veh/h/ln	1478	1710	1676	1619	1710	1621	1619	1710	1509	1619	1710	1678
Q Serve(g_s), s	20.9	26.4	26.5	10.8	16.6	17.0	3.7	29.4	2.7	3.2	0.0	0.0
Cycle Q Clear(g_c), s	20.9	26.4	26.5	10.8	16.6	17.0	3.7	29.4	2.7	3.2	0.0	0.0
Prop In Lane	1.00		0.38	1.00		0.63	1.00		1.00	1.00		0.41
Lane Grp Cap(c), veh/h	618	472	463	175	313	297	75	1156	510	1307	1907	1872
V/C Ratio(X)	1.11	0.97	0.97	1.06	0.92	0.94	0.81	0.91	0.12	0.18	0.22	0.22
Avail Cap(c_a), veh/h	618	472	463	175	313	297	105	1156	510	1307	1907	1872
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.78	0.78	0.78	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.5	35.8	35.8	44.6	40.2	40.3	47.3	31.6	22.8	2.2	0.0	0.0
Incr Delay (d2), s/veh	66.0	28.9	29.3	86.0	31.9	36.6	17.4	12.1	0.5	0.0	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.2	16.2	16.0	9.0	10.6	10.6	2.0	15.8	1.2	1.4	0.1	0.1
LnGrp Delay(d),s/veh	105.6	64.7	65.1	130.6	72.1	77.0	64.7	43.8	23.3	2.2	0.3	0.3
LnGrp LOS	F	E	E	F	E	E	E	D	C	A	A	A
Approach Vol, veh/h		1591			754			1172			1074	
Approach Delay, s/veh		82.4			88.3			43.8			0.7	
Approach LOS		F			F			D			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	87.8	40.0	16.2	33.0	9.2	118.6	25.5	23.7				
Change Period (Y+Rc), s	6.2	* 6.2	5.4	* 5.4	4.6	6.2	4.6	5.4				
Max Green Setting (Gmax), s	7.0	* 34	10.8	* 28	6.5	34.3	20.9	17.5				
Max Q Clear Time (g_c+I1), s	5.2	31.4	12.8	28.5	5.7	2.0	22.9	19.0				
Green Ext Time (p_c), s	0.2	1.7	0.0	0.0	0.0	7.9	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			54.4									
HCM 2010 LOS			D									
Notes												

Timings
16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

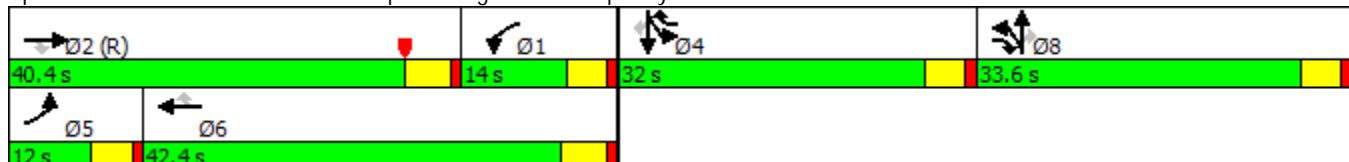


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↑	↗	↖↗	↑↑	↗	↖	↑↑	↗	↖	↑↑	↗
Traffic Volume (vph)	92	420	131	236	218	425	188	764	269	46	856	325
Future Volume (vph)	92	420	131	236	218	425	188	764	269	46	856	325
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	8	1	6	4	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	39.1	33.6	9.6	39.1	22.6	33.6	33.6	33.6	22.6	22.6	22.6
Total Split (s)	12.0	40.4	33.6	14.0	42.4	32.0	33.6	33.6	33.6	32.0	32.0	32.0
Total Split (%)	10.0%	33.7%	28.0%	11.7%	35.3%	26.7%	28.0%	28.0%	28.0%	26.7%	26.7%	26.7%
Yellow Time (s)	3.6	4.1	3.6	3.6	4.1	3.6	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lead	Lead		Lag	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	C-Max	Max	None	None	Max	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	7.4	35.3	69.4	9.4	37.3	65.2	29.0	29.0	29.0	27.4	27.4	27.4
Actuated g/C Ratio	0.06	0.29	0.58	0.08	0.31	0.54	0.24	0.24	0.24	0.23	0.23	0.23
v/c Ratio	0.97	0.44	0.14	1.04	0.37	0.30	0.45	0.99	0.52	0.13	1.14	0.68
Control Delay	135.2	37.6	8.9	120.3	18.2	10.6	43.0	73.7	18.3	38.0	121.3	31.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	135.2	37.6	8.9	120.3	18.2	10.6	43.0	73.7	18.3	38.0	121.3	31.2
LOS	F	D	A	F	B	B	D	E	B	D	F	C
Approach Delay		45.7			43.7			57.2			94.3	
Approach LOS		D			D			E			F	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT, Start of Yellow
 Natural Cycle: 125
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.14
 Intersection Signal Delay: 63.8
 Intersection LOS: E
 Intersection Capacity Utilization 101.2%
 ICU Level of Service G
 Analysis Period (min) 15

Splits and Phases: 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)

3/30/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	420	131	236	218	425	188	764	269	46	856	325
Future Volume (vph)	92	420	131	236	218	425	188	764	269	46	856	325
Ideal Flow (vphpl)	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lane Util. Factor	1.00	0.95	1.00	0.97	0.91	0.91	0.91	0.91	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	0.99	0.99	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600	1377	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600	1377	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	101	462	144	259	240	467	207	840	296	51	941	357
RTOR Reduction (vph)	0	0	28	0	146	26	0	0	139	0	0	117
Lane Group Flow (vph)	101	462	116	259	328	207	186	861	157	51	941	240
Confl. Peds. (#/hr)			4			7			2			
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	7.4	35.3	64.3	9.4	37.3	64.7	29.0	29.0	29.0	27.4	27.4	27.4
Effective Green, g (s)	7.4	35.3	64.3	9.4	37.3	64.7	29.0	29.0	29.0	27.4	27.4	27.4
Actuated g/C Ratio	0.06	0.29	0.54	0.08	0.31	0.54	0.24	0.24	0.24	0.23	0.23	0.23
Clearance Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	104	1059	1033	250	1119	742	410	870	435	388	822	411
v/s Ratio Prot	c0.06	c0.13	0.03	c0.08	0.09	0.06	0.11	c0.24		0.03	c0.26	
v/s Ratio Perm			0.04			0.09			0.09			0.13
v/c Ratio	0.97	0.44	0.11	1.04	0.29	0.28	0.45	0.99	0.36	0.13	1.14	0.59
Uniform Delay, d1	56.2	34.3	13.8	55.3	31.4	15.0	38.8	45.4	37.8	36.8	46.3	41.2
Progression Factor	1.14	1.06	1.32	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	70.0	1.1	0.2	66.6	0.1	0.2	3.6	28.1	2.3	0.7	79.4	6.0
Delay (s)	134.1	37.3	18.3	121.9	31.5	15.2	42.3	73.5	40.1	37.5	125.7	47.2
Level of Service	F	D	B	F	C	B	D	E	D	D	F	D
Approach Delay (s)		47.3			51.8			61.8			101.6	
Approach LOS		D			D			E			F	

Intersection Summary		
HCM 2000 Control Delay	69.5	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.87	E
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	101.2%	18.9
Analysis Period (min)	15	ICU Level of Service
		G

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	92	420	131	236	218	425	188	764	269	46	856	325
Future Volume (veh/h)	92	420	131	236	218	425	188	764	269	46	856	325
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	101	462	101	259	240	440	207	840	261	51	941	320
Adj No. of Lanes	1	2	1	2	1	2	1	2	1	1	2	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	100	1006	818	658	814	2044	391	870	369	370	781	349
Arrive On Green	0.02	0.10	0.10	0.22	0.45	0.45	0.24	0.24	0.24	0.23	0.23	0.23
Sat Flow, veh/h	1619	3420	1524	3048	1800	2973	1619	3600	1526	1619	3420	1530
Grp Volume(v), veh/h	101	462	101	259	240	440	207	840	261	51	941	320
Grp Sat Flow(s),veh/h/ln	1619	1710	1524	1524	1800	1487	1619	1800	1526	1619	1710	1530
Q Serve(g_s), s	7.4	15.3	4.8	8.7	10.1	6.7	13.3	27.7	18.8	3.0	27.4	24.5
Cycle Q Clear(g_c), s	7.4	15.3	4.8	8.7	10.1	6.7	13.3	27.7	18.8	3.0	27.4	24.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	100	1006	818	658	815	2044	391	870	369	370	781	349
V/C Ratio(X)	1.01	0.46	0.12	0.39	0.29	0.22	0.53	0.97	0.71	0.14	1.21	0.92
Avail Cap(c_a), veh/h	100	1006	818	658	814	2044	391	870	369	370	781	349
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.72	0.72	0.72	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.8	45.2	18.0	40.3	20.8	7.2	39.6	45.0	41.6	36.9	46.3	45.2
Incr Delay (d2), s/veh	79.7	1.1	0.2	0.1	0.2	0.1	5.0	23.2	10.9	0.8	104.2	30.9
Initial Q Delay(d3),s/veh	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	7.4	3.2	3.7	5.0	4.7	6.5	16.6	9.0	1.4	24.2	13.4
LnGrp Delay(d),s/veh	138.5	46.2	18.2	40.5	21.0	7.2	44.6	68.2	52.5	37.7	150.5	76.1
LnGrp LOS	F	D	B	D	C	A	D	E	D	D	F	E
Approach Vol, veh/h		664			939			1308			1312	
Approach Delay, s/veh		56.0			19.9			61.4			128.0	
Approach LOS		E			B			E			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	31.5	40.4		32.0	12.0	59.9		33.6				
Change Period (Y+Rc), s	5.1	* 5.1		4.6	4.6	5.1		4.6				
Max Green Setting (Gmax), s	9.4	* 35		27.4	7.4	37.3		29.0				
Max Q Clear Time (g_c+I1), s	10.7	17.3		29.4	9.4	12.1		29.7				
Green Ext Time (p_c), s	0.0	3.1		0.0	0.0	3.8		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				72.0								
HCM 2010 LOS				E								
Notes												

APPENDIX 7.3:

EAC (2018) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-3. Warrant 3, Peak Hour

Traffic Conditions = **EAC (2018) Conditions - Weekday PM Peak Hour**

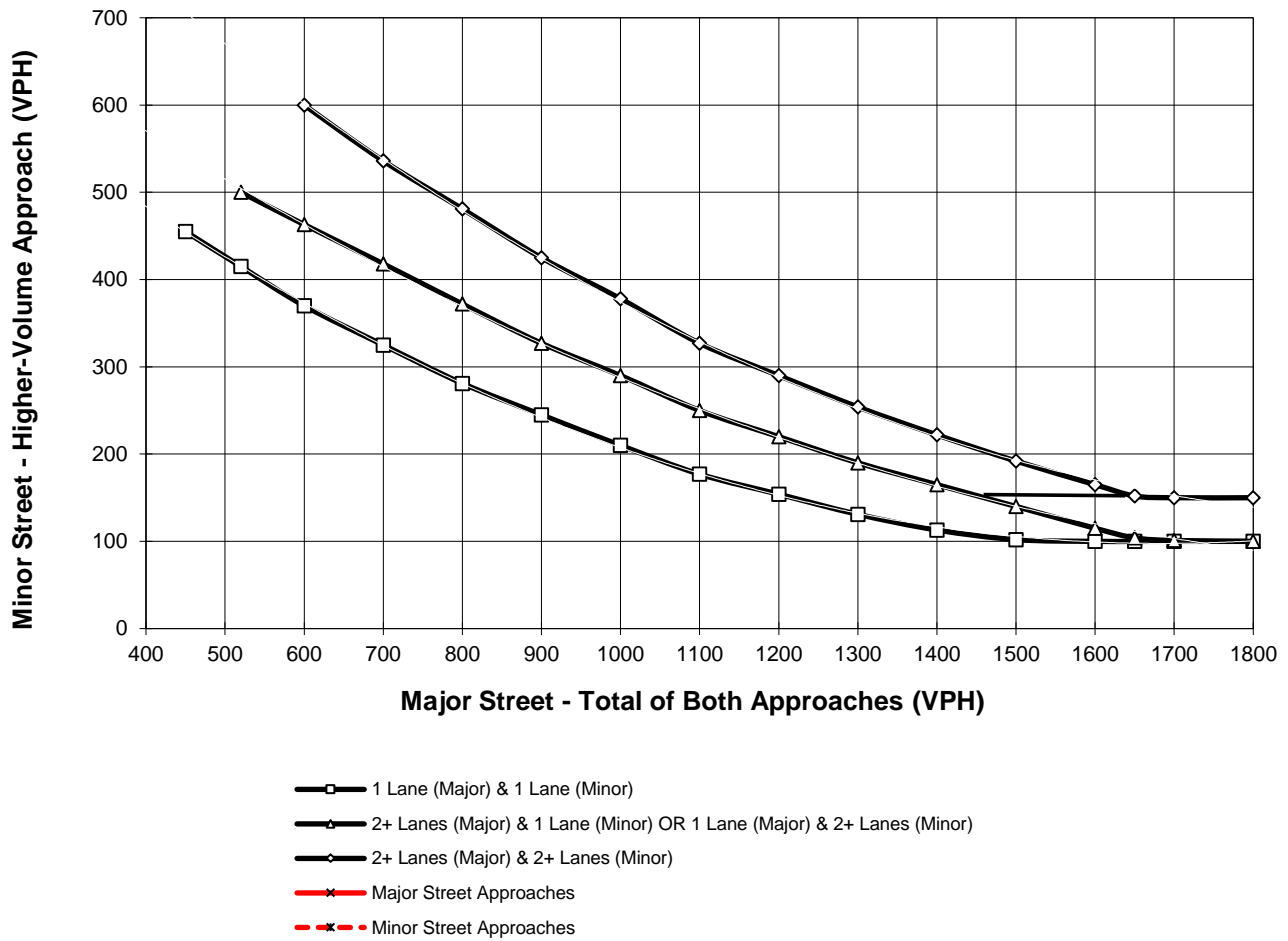
Major Street Name = **Dumas St.**

Total of Both Approaches (VPH) = **32**
 Number of Approach Lanes on Major Street = **1**

Minor Street Name = **Washington Av.**

High Volume Approach (VPH) = **22**
 Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 150 vph applies as the lower threshold for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **EAC (2018) Conditions - Weekday AM Peak Hour**

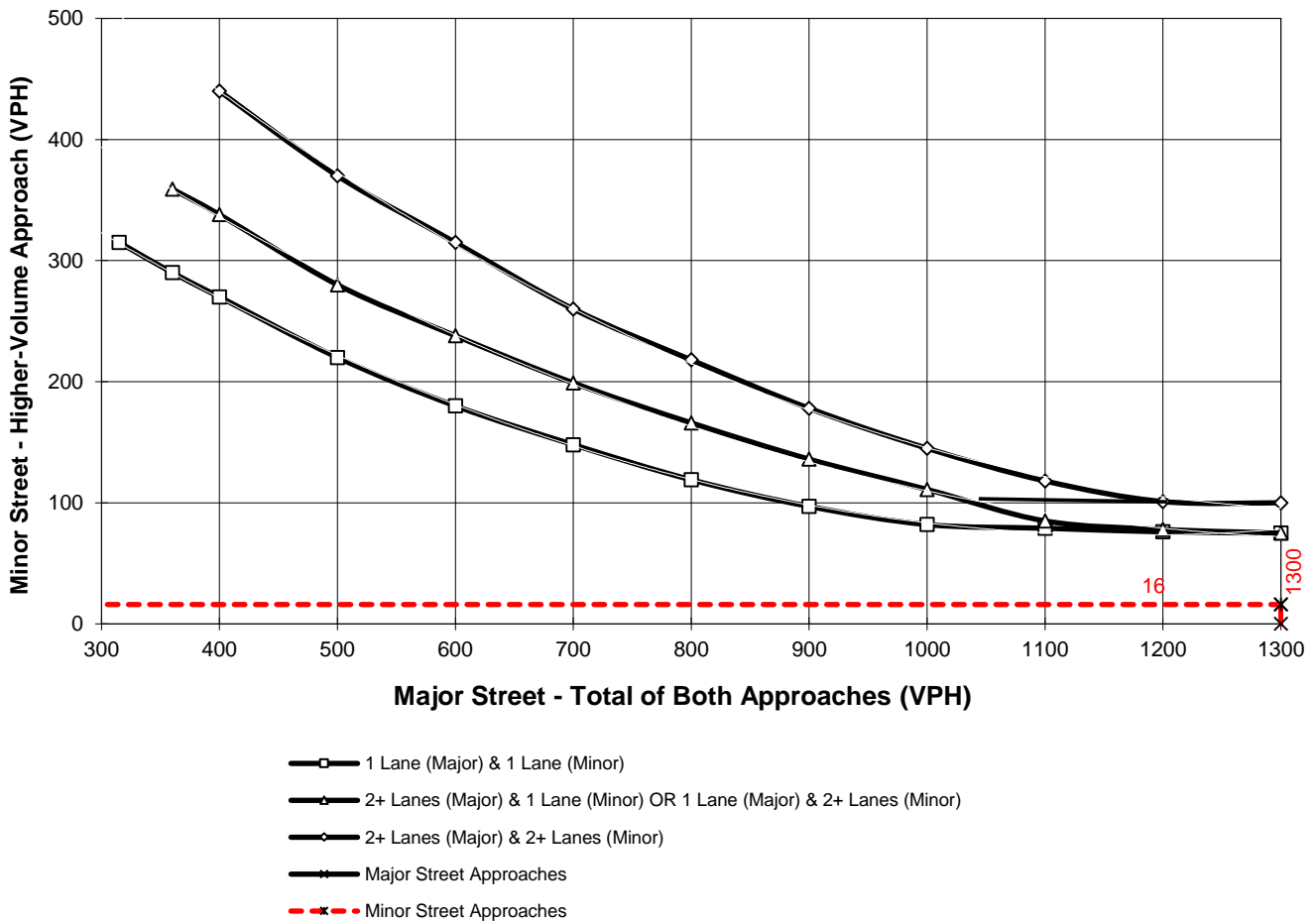
Major Street Name = **Waterman Av.**

Total of Both Approaches (VPH) = **2003**
 Number of Approach Lanes Major Street = **2**

Minor Street Name = **Dumas St.**

High Volume Approach (VPH) = **16**
 Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

APPENDIX 7.4:

EAPC (2018) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

<u>DIST</u>	<u>CO</u>	<u>RTE</u>	<u>PM</u>	<u>CALC</u>	<u>TRAFFIC CONDITIONS</u>	<u>EAPC (2018)</u>
Jurisdiction: <u>City of San Bernardino</u>				CHK <u>BA</u>	DATE <u>03/28/17</u>	DATE <u>03/28/17</u>
Major Street: <u>Washington Avenue</u>					Critical Approach Speed (Major) <u>25</u> mph	
Minor Street: <u>Driveway 1</u>					Critical Approach Speed (Minor) <u>25</u> mph	
Major Street Approach Lanes =		<u>1</u>	lane	Minor Street Approach Lanes =		<u>1</u> lane
Major Street Future ADT =		<u>972</u>	vpd	Minor Street Future ADT =		<u>367</u> vpd
Speed limit or critical speed on major street traffic > 64 km/h (40 mph);						<input type="checkbox"/>
						or
In built up area of isolated community of < 10,000 population						<input type="checkbox"/>

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

<u>URBAN</u>	<u>RURAL</u>	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
<u>Satisfied</u>	<u>Not Satisfied</u>				
	XX				
Number of lanes for moving traffic on each approach		<u>Urban</u>	<u>Rural</u>	<u>Urban</u>	<u>Rural</u>
<u>Major Street</u>	<u>Minor Street</u>				
1 972	1 367	8,000	5,600	2,400	1,680
2 +	1	9,600	6,720	2,400	1,680
2 +	2 +	9,600	6,720	3,200	2,240
1	2 +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
<u>Satisfied</u>	<u>Not Satisfied</u>				
	XX				
Number of lanes for moving traffic on each approach		<u>Urban</u>	<u>Rural</u>	<u>Urban</u>	<u>Rural</u>
<u>Major Street</u>	<u>Minor Street</u>				
1 972	1 367	12,000	8,400	1,200	850
2 +	1	14,400	10,080	1,200	850
2 +	2 +	14,400	10,080	1,600	1,120
1	2 +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B		2 CONDITIONS 80%		2 CONDITIONS 80%	
<u>Satisfied</u>	<u>Not Satisfied</u>				
	XX				
No one condition satisfied, but following conditions fulfilled 80% of more					
	<u>A</u>				
	12%				
	<u>B</u>				
	8%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.



Figure 4C-3. Warrant 3, Peak Hour

Traffic Conditions = **EAPC (2018) Conditions - Weekday PM Peak Hour**

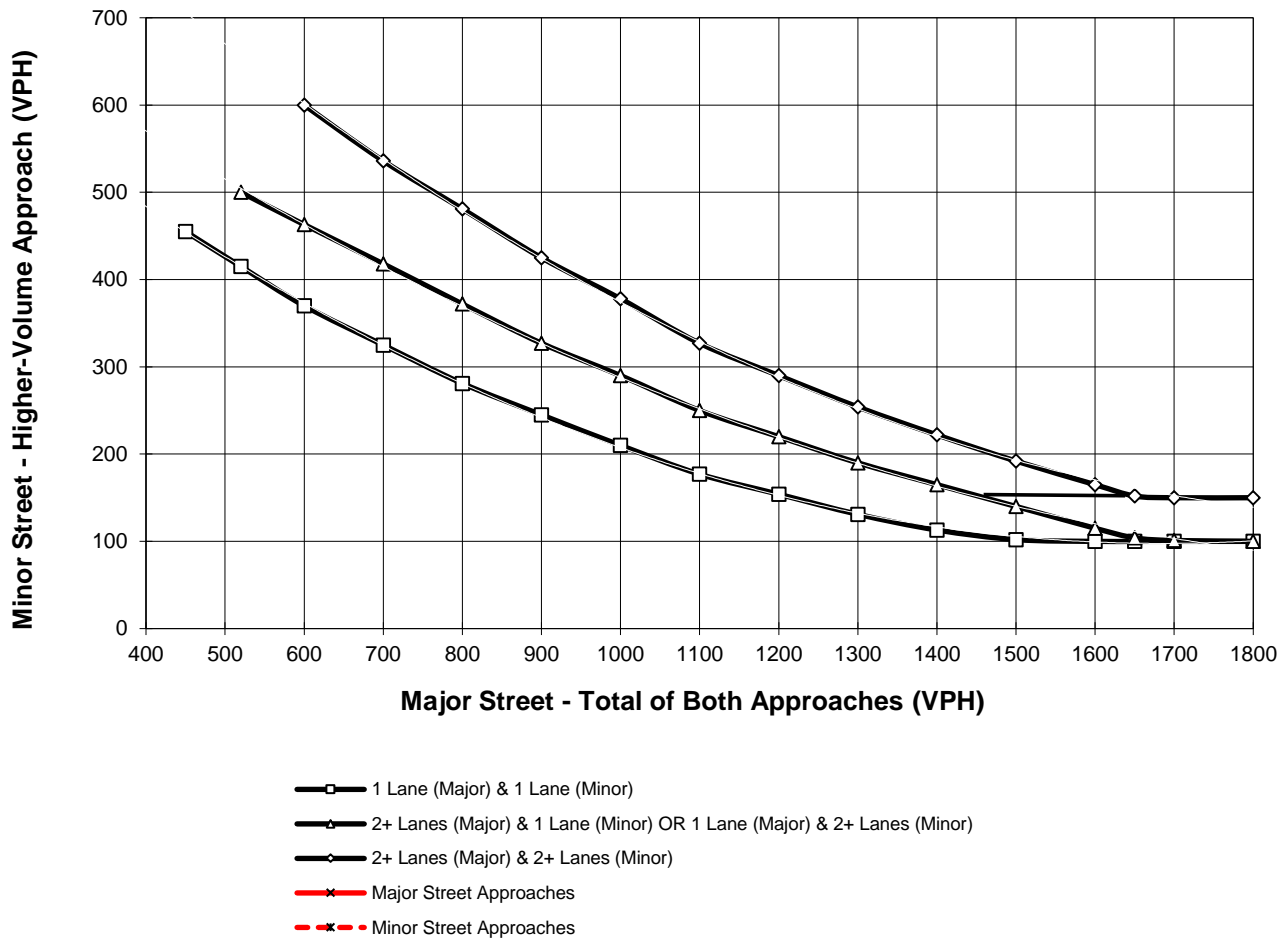
Major Street Name = **Dumas St.**

Total of Both Approaches (VPH) = **32**
 Number of Approach Lanes on Major Street = **1**

Minor Street Name = **Washington Av.**

High Volume Approach (VPH) = **22**
 Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 150 vph applies as the lower threshold for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-3. Warrant 3, Peak Hour

Traffic Conditions = **EAPC (2018) (Alternative Access) Conditions - Weekday PM Peak Hour**

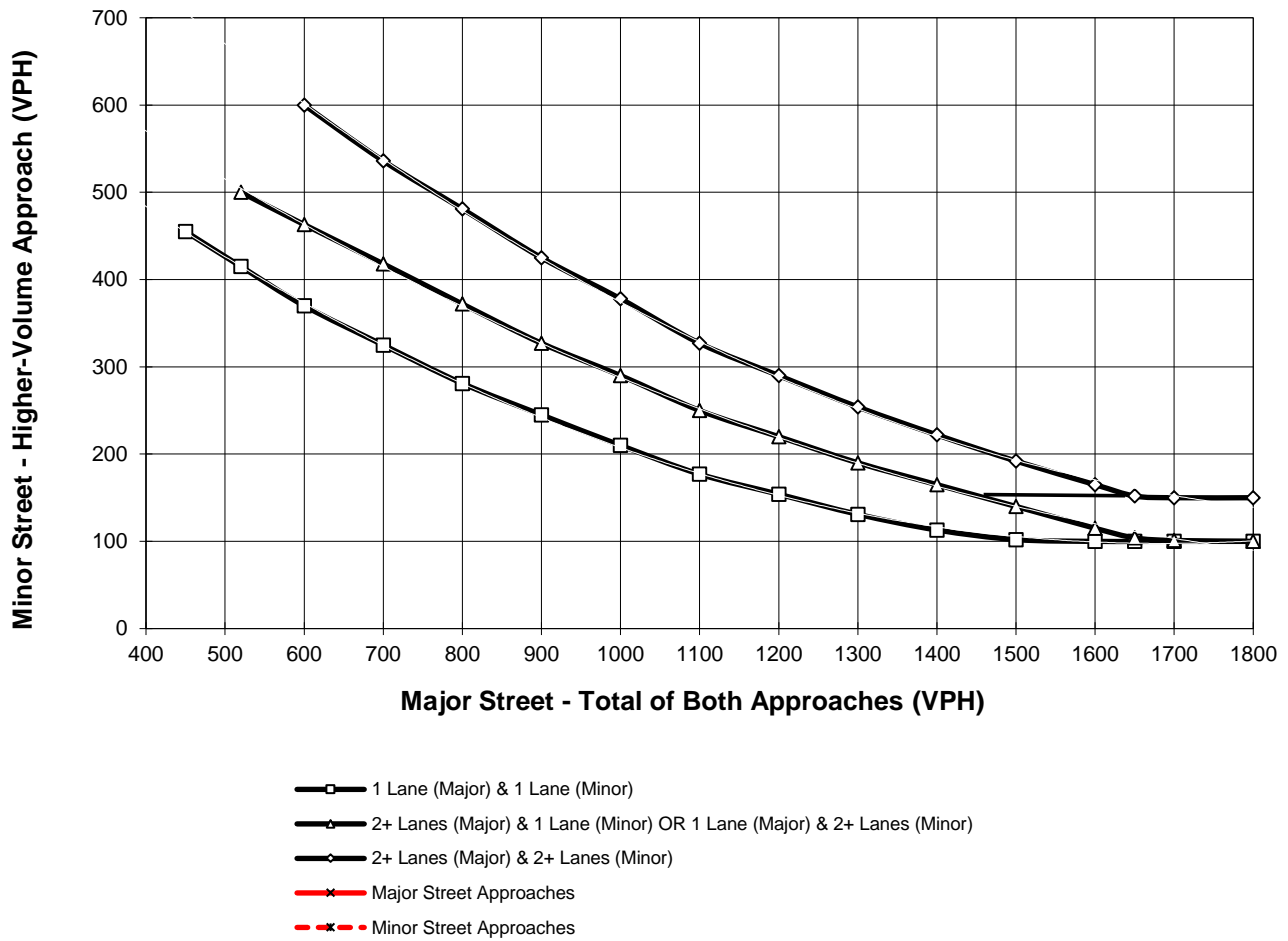
Major Street Name = **Washington Av.**

Total of Both Approaches (VPH) = **63**
 Number of Approach Lanes on Major Street = **1**

Minor Street Name = **Dumas St.**

High Volume Approach (VPH) = **32**
 Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 150 vph applies as the lower threshold for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **EAPC (2018) Conditions - Weekday AM Peak Hour**

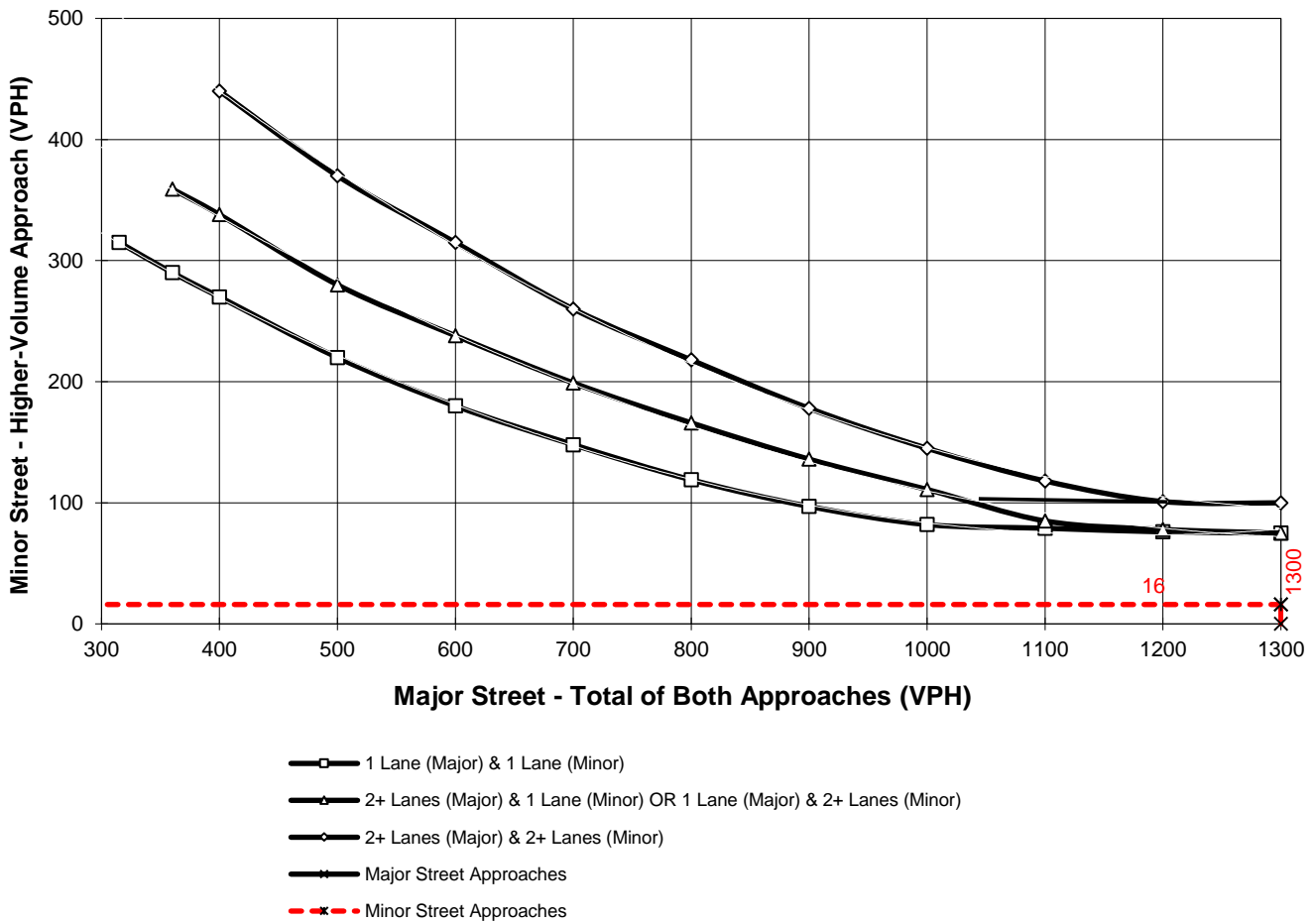
Major Street Name = **Waterman Av.**

Total of Both Approaches (VPH) = **2067**
 Number of Approach Lanes Major Street = **2**

Minor Street Name = **Dumas St.**

High Volume Approach (VPH) = **16**
 Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

APPENDIX 7.5:

EAC (2018) CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS

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Queues

1: I-215 SB Ramps & Auto Center Rd.



Lane Group	EBT	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	215	244	646	643	382
v/c Ratio	0.14	0.16	0.91	0.86	0.39
Control Delay	9.3	11.3	37.5	30.2	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	9.3	11.3	37.5	30.2	2.8
Queue Length 50th (ft)	20	27	221	212	0
Queue Length 95th (ft)	37	47	#425	#405	42
Internal Link Dist (ft)	663	209		2403	
Turn Bay Length (ft)					465
Base Capacity (vph)	1521	1500	708	750	972
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.14	0.16	0.91	0.86	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Queues

2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	91	1347	396	320	98	97	1197
v/c Ratio	0.46	0.72	0.29	0.36	0.18	0.17	0.98
Control Delay	34.1	14.5	16.0	3.6	16.9	16.8	43.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.1	14.5	16.0	3.6	16.9	16.8	43.0
Queue Length 50th (ft)	34	196	58	0	28	28	245
Queue Length 95th (ft)	73	268	94	48	62	61	#395
Internal Link Dist (ft)		295	473			974	
Turn Bay Length (ft)	270			230	315		275
Base Capacity (vph)	243	1883	1364	880	549	581	1225
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.72	0.29	0.36	0.18	0.17	0.98

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Queues

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.



Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	577	39	614	25	491	504	746
v/c Ratio	0.60	0.38	0.51	0.08	0.54	0.52	0.70
Control Delay	42.3	64.3	34.0	0.5	21.9	21.3	19.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.3	64.3	34.0	0.5	21.9	21.3	19.0
Queue Length 50th (ft)	213	30	200	0	270	274	319
Queue Length 95th (ft)	284	66	257	0	384	384	480
Internal Link Dist (ft)	873		790			811	
Turn Bay Length (ft)		150			100		215
Base Capacity (vph)	969	136	1200	309	909	964	1065
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.29	0.51	0.08	0.54	0.52	0.70

Intersection Summary

Queues

16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

3/24/2017



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	113	185	58	44	732	341	789	194	8	509	121
v/c Ratio	0.30	0.14	0.05	0.25	0.75	0.76	0.83	0.33	0.03	0.86	0.28
Control Delay	42.5	24.9	1.3	53.0	23.3	49.8	47.1	9.2	39.1	60.8	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.5	24.9	1.3	53.0	23.3	49.8	47.1	9.2	39.1	60.8	4.2
Queue Length 50th (ft)	66	46	0	15	121	243	289	16	5	186	0
Queue Length 95th (ft)	#168	75	9	34	156	#387	368	73	20	#274	24
Internal Link Dist (ft)		1015			1164		440			335	
Turn Bay Length (ft)	85		270	250		800		160	110		110
Base Capacity (vph)	371	1309	1174	212	1405	448	949	594	278	589	430
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.14	0.05	0.21	0.52	0.76	0.83	0.33	0.03	0.86	0.28

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Queues

1: I-215 SB Ramps & Auto Center Rd.

3/24/2017



Lane Group	EBT	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	677	452	367	374	288
v/c Ratio	0.43	0.30	0.53	0.51	0.32
Control Delay	10.9	6.3	16.7	16.2	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.9	6.3	16.7	16.2	3.1
Queue Length 50th (ft)	70	25	101	102	2
Queue Length 95th (ft)	107	34	174	173	40
Internal Link Dist (ft)	663	209		2403	
Turn Bay Length (ft)					465
Base Capacity (vph)	1589	1524	697	738	902
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.43	0.30	0.53	0.51	0.32

Intersection Summary



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	235	857	1083	730	66	65	1093
v/c Ratio	1.32	0.42	0.75	0.63	0.15	0.14	0.95
Control Delay	201.5	5.2	19.2	5.3	17.9	17.7	35.5
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	12.0
Total Delay	201.5	5.4	19.2	5.3	17.9	17.7	47.5
Queue Length 50th (ft)	~104	25	169	95	18	18	170
Queue Length 95th (ft)	#229	61	m161	m87	46	46	#306
Internal Link Dist (ft)		295	473			974	
Turn Bay Length (ft)	270			230	315		275
Base Capacity (vph)	178	2040	1452	1161	453	480	1151
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	498	0	0	0	0	74
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.32	0.56	0.75	0.63	0.15	0.14	1.01

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Queues

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.



Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	911	24	660	69	347	350	430
v/c Ratio	0.64	0.29	0.41	0.31	0.51	0.48	0.47
Control Delay	33.1	64.2	23.5	3.5	30.8	30.0	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.1	64.2	23.5	3.5	30.8	30.0	8.1
Queue Length 50th (ft)	316	18	178	0	215	214	48
Queue Length 95th (ft)	394	47	227	0	315	311	131
Internal Link Dist (ft)	873		790			811	
Turn Bay Length (ft)		150			100		215
Base Capacity (vph)	1413	90	1608	308	685	726	924
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.27	0.41	0.22	0.51	0.48	0.47

Intersection Summary

Queues
16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	101	462	135	259	699	179	860	296	51	941	342
v/c Ratio	0.97	0.44	0.13	1.04	0.50	0.44	0.99	0.52	0.13	1.14	0.65
Control Delay	135.2	37.6	8.7	120.3	14.2	42.6	73.5	18.3	38.0	121.3	29.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	135.2	37.6	8.7	120.3	14.2	42.6	73.5	18.3	38.0	121.3	29.7
Queue Length 50th (ft)	83	146	40	~110	87	129	366	71	32	-449	136
Queue Length 95th (ft)	m#168	m184	m68	#198	144	207	#510	160	67	#580	241
Internal Link Dist (ft)		1015			1164		440			335	
Turn Bay Length (ft)	85		270	250		800		160	110		110
Base Capacity (vph)	104	1059	1066	250	1405	410	870	573	388	822	525
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.44	0.13	1.04	0.50	0.44	0.99	0.52	0.13	1.14	0.65

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

APPENDIX 7.6:

EAPC (2018) CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS

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Queues

1: I-215 SB Ramps & Auto Center Rd.



Lane Group	EBT	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	217	245	659	656	382
v/c Ratio	0.14	0.16	0.93	0.87	0.39
Control Delay	9.3	11.3	40.4	31.9	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	9.3	11.3	40.4	31.9	2.8
Queue Length 50th (ft)	20	27	228	218	0
Queue Length 95th (ft)	38	47	#436	#416	42
Internal Link Dist (ft)	663	209		2403	
Turn Bay Length (ft)					465
Base Capacity (vph)	1521	1500	708	750	972
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.14	0.16	0.93	0.87	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	91	1376	410	331	98	97	1227
v/c Ratio	0.46	0.73	0.30	0.37	0.18	0.17	1.00
Control Delay	34.1	14.9	16.1	3.6	16.9	16.8	48.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.1	14.9	16.1	3.6	16.9	16.8	48.8
Queue Length 50th (ft)	34	203	61	0	28	28	~255
Queue Length 95th (ft)	73	277	97	49	62	61	#410
Internal Link Dist (ft)		295	473			974	
Turn Bay Length (ft)	270			230	315		275
Base Capacity (vph)	243	1883	1364	888	549	581	1225
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.73	0.30	0.37	0.18	0.17	1.00

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.



Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	577	39	614	25	491	504	746
v/c Ratio	0.60	0.38	0.51	0.08	0.54	0.52	0.70
Control Delay	42.3	64.3	34.0	0.5	21.9	21.3	19.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.3	64.3	34.0	0.5	21.9	21.3	19.0
Queue Length 50th (ft)	213	30	200	0	270	274	319
Queue Length 95th (ft)	284	66	257	0	384	384	480
Internal Link Dist (ft)	873		790			811	
Turn Bay Length (ft)		150			100		215
Base Capacity (vph)	969	136	1200	309	909	964	1065
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.29	0.51	0.08	0.54	0.52	0.70

Intersection Summary

Queues

16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

3/24/2017



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	113	185	61	44	747	352	790	194	8	509	127
v/c Ratio	0.31	0.14	0.05	0.25	0.75	0.79	0.83	0.33	0.03	0.86	0.30
Control Delay	42.9	24.9	1.3	53.0	23.8	51.5	47.1	9.2	39.1	60.8	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.9	24.9	1.3	53.0	23.8	51.5	47.1	9.2	39.1	60.8	4.7
Queue Length 50th (ft)	67	46	0	15	126	253	289	16	5	186	0
Queue Length 95th (ft)	#168	75	9	34	162	#407	#369	73	20	#274	29
Internal Link Dist (ft)		1015			1164		440			335	
Turn Bay Length (ft)	85		270	250		800		160	110		110
Base Capacity (vph)	364	1309	1174	212	1405	448	949	594	278	589	430
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.14	0.05	0.21	0.53	0.79	0.83	0.33	0.03	0.86	0.30

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Queues

1: I-215 SB Ramps & Auto Center Rd.



Lane Group	EBT	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	678	454	375	379	288
v/c Ratio	0.43	0.30	0.54	0.51	0.32
Control Delay	11.0	6.3	17.0	16.3	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.0	6.3	17.0	16.3	3.1
Queue Length 50th (ft)	70	24	103	103	2
Queue Length 95th (ft)	108	34	180	176	40
Internal Link Dist (ft)	663	209		2403	
Turn Bay Length (ft)					465
Base Capacity (vph)	1589	1524	697	738	901
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.43	0.30	0.54	0.51	0.32

Intersection Summary



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	235	870	1118	758	66	65	1108
v/c Ratio	1.32	0.43	0.77	0.64	0.15	0.14	0.97
Control Delay	201.5	5.2	14.4	4.6	17.9	17.7	39.0
Queue Delay	0.0	0.4	0.0	0.4	0.0	0.0	20.6
Total Delay	201.5	5.6	14.4	5.0	17.9	17.7	59.7
Queue Length 50th (ft)	~104	25	216	87	18	18	176
Queue Length 95th (ft)	#229	62	m197	m82	46	46	#316
Internal Link Dist (ft)		295	473			974	
Turn Bay Length (ft)	270			230	315		275
Base Capacity (vph)	178	2040	1452	1178	453	480	1145
Starvation Cap Reductn	0	0	0	114	0	0	0
Spillback Cap Reductn	0	604	0	0	0	0	87
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.32	0.61	0.77	0.71	0.15	0.14	1.05

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Queues

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.



Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	911	24	660	69	347	350	430
v/c Ratio	0.64	0.29	0.41	0.31	0.51	0.48	0.47
Control Delay	33.1	64.2	23.5	3.5	30.8	30.0	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.1	64.2	23.5	3.5	30.8	30.0	8.1
Queue Length 50th (ft)	316	18	178	0	215	214	48
Queue Length 95th (ft)	394	47	227	0	315	311	131
Internal Link Dist (ft)	873		790			811	
Turn Bay Length (ft)		150			100		215
Base Capacity (vph)	1413	90	1608	308	685	726	924
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.27	0.41	0.22	0.51	0.48	0.47

Intersection Summary

Queues

16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

3/24/2017



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	101	462	144	259	707	186	861	296	51	941	357
v/c Ratio	0.97	0.44	0.14	1.04	0.50	0.45	0.99	0.52	0.13	1.14	0.68
Control Delay	135.2	37.6	8.9	120.3	14.1	43.0	73.7	18.3	38.0	121.3	31.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	135.2	37.6	8.9	120.3	14.1	43.0	73.7	18.3	38.0	121.3	31.2
Queue Length 50th (ft)	83	146	44	~110	87	135	367	71	32	-449	147
Queue Length 95th (ft)	m#168	m184	m74	#198	145	215	#512	160	67	#580	255
Internal Link Dist (ft)		1015			1164		440			335	
Turn Bay Length (ft)	85		270	250		800		160	110		110
Base Capacity (vph)	104	1059	1066	250	1411	410	870	573	388	822	527
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.44	0.14	1.04	0.50	0.45	0.99	0.52	0.13	1.14	0.68

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

APPENDIX 7.7:

**WATERMAN AVENUE AND ORANGE SHOW ROAD PEAK HOUR QUEUING ANALYSIS
FOR EAPC (2018) CONDITIONS**

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Intersection: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	R	L	T	T	R	L
Maximum Queue (ft)	245	238	225	246	246	295	68	180	213	217	102	158
Average Queue (ft)	137	140	140	108	134	154	21	95	130	139	37	77
95th Queue (ft)	219	217	210	206	220	269	49	163	192	205	77	142
Link Distance (ft)		1440	1440	1440		2230	2230		657	657	657	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	210				210			225				250
Storage Blk Time (%)	2	1			2	3		0	0			
Queuing Penalty (veh)	6	2			7	6		0	0			

Intersection: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	277	261	55
Average Queue (ft)	196	168	23
95th Queue (ft)	261	239	42
Link Distance (ft)	1268	1268	1268
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)	1		
Queuing Penalty (veh)	1		

Intersection: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	R	L	T	T	R	L
Maximum Queue (ft)	290	465	461	190	305	2245	2245	340	672	595	143	319
Average Queue (ft)	186	278	277	84	263	2232	2161	340	652	287	57	132
95th Queue (ft)	296	416	408	158	393	2342	2774	340	722	568	112	253
Link Distance (ft)		1440	1440	1440		2230	2230		657	657	657	
Upstream Blk Time (%)						91	48		55	0		
Queuing Penalty (veh)						0	0		240	0		
Storage Bay Dist (ft)	210				210			225				250
Storage Blk Time (%)	3	20			23	69		90	2			0
Queuing Penalty (veh)	15	37			136	129		360	5			1

Intersection: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	364	336	85
Average Queue (ft)	244	227	36
95th Queue (ft)	333	314	64
Link Distance (ft)	1268	1268	1268
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)	8		
Queuing Penalty (veh)	12		

APPENDIX 7.8:

**WATERMAN AVENUE AND ORANGE SHOW ROAD PEAK HOUR QUEUING ANALYSIS
FOR EAPC (2018) CONDITIONS WITH IMPROVEMENTS**

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Queuing and Blocking Report
 EAPC (2018) - AM Peak Hour WITH IMPROVEMENTS

3/28/2017

Intersection: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	R	L	L	T	T	R
Maximum Queue (ft)	240	226	234	236	261	334	59	83	146	237	231	104
Average Queue (ft)	142	139	155	128	122	168	20	29	52	128	136	37
95th Queue (ft)	219	205	220	217	213	278	44	66	95	197	203	81
Link Distance (ft)		1435	1435	1435		2224	2224			657	657	657
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	210				210			225	225			
Storage Blk Time (%)	1	0			1	5			0	0		
Queuing Penalty (veh)	4	0			2	9			0	0		

Intersection: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	136	282	260	52
Average Queue (ft)	55	184	156	21
95th Queue (ft)	102	263	241	42
Link Distance (ft)		1268	1268	1268
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	250			
Storage Blk Time (%)		1		
Queuing Penalty (veh)		1		

Queuing and Blocking Report
 EAPC (2018) - PM Peak Hour WITH IMPROVEMENTS

3/28/2017

Intersection: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	R	L	L	T	T	R
Maximum Queue (ft)	290	587	574	206	305	2240	2239	160	190	234	239	116
Average Queue (ft)	224	364	366	85	251	2170	1999	90	97	141	163	52
95th Queue (ft)	347	576	565	168	399	2478	3009	142	150	205	226	97
Link Distance (ft)		1435	1435	1435		2224	2224			657	657	657
Upstream Blk Time (%)						78	36					
Queuing Penalty (veh)						0	0					
Storage Bay Dist (ft)	210				210			225	225			
Storage Blk Time (%)	19	34			6	70		0	0	0		
Queuing Penalty (veh)	91	64			33	131		0	0	1		

Intersection: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	269	356	324	84
Average Queue (ft)	116	224	203	40
95th Queue (ft)	202	311	287	70
Link Distance (ft)		1268	1268	1268
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	250			
Storage Blk Time (%)	0	5		
Queuing Penalty (veh)	0	7		

APPENDIX 7.9:

**EAC (2018) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH
IMPROVEMENTS**

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Timings

9: Waterman Av. & Orange Show Rd./Orange Show Rd.

3/28/2017

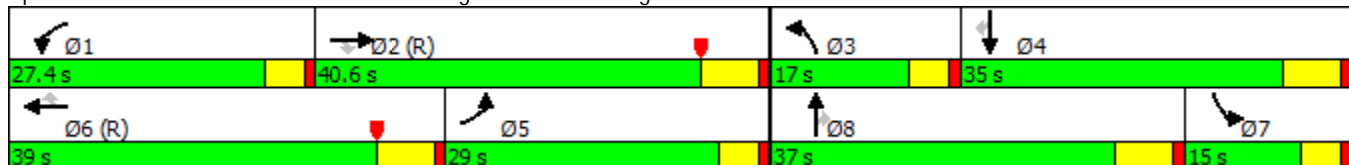


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑	↗	↘↗	↑↑	↗	↘	↑↑	↗
Traffic Volume (vph)	202	627	392	169	333	92	85	521	152	81	632	74
Future Volume (vph)	202	627	392	169	333	92	85	521	152	81	632	74
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.2	35.2	9.6	35.2	35.2	9.6	33.2	33.2	9.6	33.2	33.2
Total Split (s)	29.0	40.6	40.6	27.4	39.0	39.0	17.0	37.0	37.0	15.0	35.0	35.0
Total Split (%)	24.2%	33.8%	33.8%	22.8%	32.5%	32.5%	14.2%	30.8%	30.8%	12.5%	29.2%	29.2%
Yellow Time (s)	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Act Effect Green (s)	24.4	39.5	39.5	17.7	32.8	32.8	10.4	30.8	30.8	10.4	30.8	30.8
Actuated g/C Ratio	0.20	0.33	0.33	0.15	0.27	0.27	0.09	0.26	0.26	0.09	0.26	0.26
v/c Ratio	0.68	0.62	0.55	0.78	0.79	0.17	0.67	0.66	0.30	0.64	0.79	0.15
Control Delay	55.4	37.5	11.0	70.1	53.1	0.6	75.1	43.8	5.8	73.1	49.5	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.4	37.5	11.0	70.1	53.1	0.6	75.1	43.8	5.8	73.1	49.5	0.5
LOS	E	D	B	E	D	A	E	D	A	E	D	A
Approach Delay		31.9			49.8			39.7			47.3	
Approach LOS		C			D			D			D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 40.5
 Intersection LOS: D
 Intersection Capacity Utilization 71.6%
 ICU Level of Service C
 Analysis Period (min) 15

























Splits and Phases: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/28/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	202	627	392	169	333	92	85	521	152	81	632	74
Future Volume (vph)	202	627	392	169	333	92	85	521	152	81	632	74
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	235	729	456	197	387	107	99	606	177	94	735	86
RTOR Reduction (vph)	0	0	236	0	0	78	0	0	132	0	0	64
Lane Group Flow (vph)	235	729	220	197	387	29	99	606	45	94	735	22
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	24.4	39.5	39.5	17.7	32.8	32.8	10.4	30.8	30.8	10.4	30.8	30.8
Effective Green, g (s)	24.4	39.5	39.5	17.7	32.8	32.8	10.4	30.8	30.8	10.4	30.8	30.8
Actuated g/C Ratio	0.20	0.33	0.33	0.15	0.27	0.27	0.09	0.26	0.26	0.09	0.26	0.26
Clearance Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	345	1185	592	250	492	492	147	924	462	147	924	462
v/s Ratio Prot	c0.14	0.20		0.12	c0.21		0.06	c0.17		0.06	c0.20	
v/s Ratio Perm			0.12			0.02			0.03			0.01
v/c Ratio	0.68	0.62	0.37	0.79	0.79	0.06	0.67	0.66	0.10	0.64	0.80	0.05
Uniform Delay, d1	44.2	33.9	30.8	49.3	40.4	32.2	53.2	39.9	34.0	53.0	41.7	33.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.4	2.4	1.8	14.0	12.0	0.2	9.2	3.6	0.4	6.6	7.0	0.2
Delay (s)	48.6	36.3	32.5	63.3	52.3	32.4	62.3	43.5	34.4	59.5	48.7	33.8
Level of Service	D	D	C	E	D	C	E	D	C	E	D	C
Approach Delay (s)		37.1			52.4			43.8			48.4	
Approach LOS		D			D			D			D	

Intersection Summary

























HCM 2000 Control Delay	44.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/28/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	202	627	392	169	333	92	85	521	152	81	632	74
Future Volume (veh/h)	202	627	392	169	333	92	85	521	152	81	632	74
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	235	729	357	197	387	66	99	606	141	94	735	63
Adj No. of Lanes	1	2	1	1	1	1	2	2	1	1	2	1
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	311	1169	523	222	492	418	146	878	393	115	1008	451
Arrive On Green	0.19	0.34	0.34	0.14	0.27	0.27	0.05	0.26	0.26	0.07	0.29	0.29
Sat Flow, veh/h	1619	3420	1530	1619	1800	1530	3141	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	235	729	357	197	387	66	99	606	141	94	735	63
Grp Sat Flow(s),veh/h/ln	1619	1710	1530	1619	1800	1530	1570	1710	1530	1619	1710	1530
Q Serve(g_s), s	16.5	21.4	24.0	14.3	23.9	3.9	3.7	19.2	6.3	6.9	23.2	2.1
Cycle Q Clear(g_c), s	16.5	21.4	24.0	14.3	23.9	3.9	3.7	19.2	6.3	6.9	23.2	2.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	311	1169	523	222	492	418	146	878	393	115	1008	451
V/C Ratio(X)	0.75	0.62	0.68	0.89	0.79	0.16	0.68	0.69	0.36	0.82	0.73	0.14
Avail Cap(c_a), veh/h	329	1169	523	308	492	418	325	878	393	140	1008	451
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.30	0.30	0.30	1.00	1.00	1.00	0.80	0.80	0.80	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.8	33.0	33.9	50.9	40.4	33.1	56.3	40.3	17.6	55.0	38.0	10.5
Incr Delay (d2), s/veh	2.5	0.8	2.2	16.4	12.0	0.8	1.6	3.5	2.0	21.7	4.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.6	10.2	10.4	7.4	13.5	1.7	1.7	9.5	2.9	3.8	11.6	1.0
LnGrp Delay(d),s/veh	48.3	33.8	36.1	67.2	52.3	33.9	58.0	43.8	19.6	76.7	42.7	11.2
LnGrp LOS	D	C	D	E	D	C	E	D	B	E	D	B
Approach Vol, veh/h		1321			650			846			892	
Approach Delay, s/veh		37.0			55.0			41.5			44.0	
Approach LOS		D			D			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	21.1	47.2	10.2	41.6	29.3	39.0	14.7	37.0				
Change Period (Y+Rc), s	4.6	6.2	4.6	6.2	6.2	* 6.2	6.2	* 6.2				
Max Green Setting (Gmax), s	22.8	34.4	12.4	28.8	24.4	* 33	10.4	* 31				
Max Q Clear Time (g_c+I1), s	16.3	26.0	5.7	25.2	18.5	25.9	8.9	21.2				
Green Ext Time (p_c), s	0.1	4.8	0.1	1.6	0.6	1.7	0.1	2.8				
Intersection Summary												
HCM 2010 Ctrl Delay			42.9									
HCM 2010 LOS			D									
Notes												

Timings

9: Waterman Av. & Orange Show Rd./Orange Show Rd.

3/28/2017

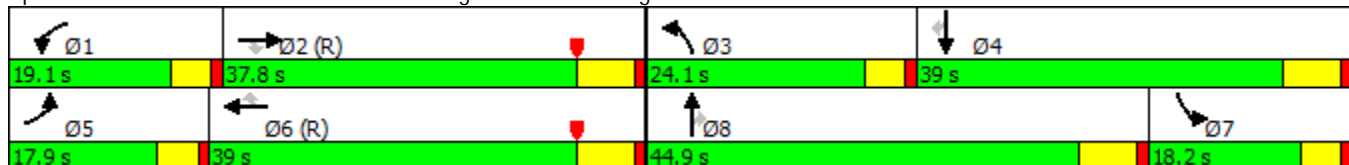


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑	↗	↘↗	↑↑	↗	↘	↑↑	↗
Traffic Volume (vph)	187	937	259	183	583	95	268	795	210	151	822	149
Future Volume (vph)	187	937	259	183	583	95	268	795	210	151	822	149
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.2	35.2	9.6	35.2	35.2	9.6	33.2	33.2	9.6	33.2	33.2
Total Split (s)	17.9	37.8	37.8	19.1	39.0	39.0	24.1	44.9	44.9	18.2	39.0	39.0
Total Split (%)	14.9%	31.5%	31.5%	15.9%	32.5%	32.5%	20.1%	37.4%	37.4%	15.2%	32.5%	32.5%
Yellow Time (s)	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Act Effect Green (s)	13.3	31.6	31.6	14.5	32.8	32.8	19.5	38.7	38.7	13.6	32.8	32.8
Actuated g/C Ratio	0.11	0.26	0.26	0.12	0.27	0.27	0.16	0.32	0.32	0.11	0.27	0.27
v/c Ratio	1.05	1.04	0.42	0.94	1.25	0.16	1.02	0.72	0.30	0.83	0.88	0.26
Control Delay	130.3	83.4	9.1	102.1	165.3	0.6	109.6	40.1	4.9	84.7	53.2	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	130.3	83.4	9.1	102.1	165.3	0.6	109.6	40.1	4.9	84.7	53.2	6.3
LOS	F	F	A	F	F	A	F	D	A	F	D	A
Approach Delay		75.8			133.7			49.0			51.2	
Approach LOS		E			F			D			D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 14.1 (12%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.25
 Intersection Signal Delay: 73.2
 Intersection LOS: E
 Intersection Capacity Utilization 94.5%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/28/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑	↗	↘↗	↑↑	↗	↘	↑↑	↗
Traffic Volume (vph)	187	937	259	183	583	95	268	795	210	151	822	149
Future Volume (vph)	187	937	259	183	583	95	268	795	210	151	822	149
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	197	986	273	193	614	100	282	837	221	159	865	157
RTOR Reduction (vph)	0	0	174	0	0	73	0	0	150	0	0	114
Lane Group Flow (vph)	197	986	99	193	614	27	282	837	71	159	865	43
Confl. Peds. (#/hr)			1						1			
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	13.3	31.6	31.6	14.5	32.8	32.8	19.5	38.7	38.7	13.6	32.8	32.8
Effective Green, g (s)	13.3	31.6	31.6	14.5	32.8	32.8	19.5	38.7	38.7	13.6	32.8	32.8
Actuated g/C Ratio	0.11	0.26	0.26	0.12	0.27	0.27	0.16	0.32	0.32	0.11	0.27	0.27
Clearance Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	188	948	474	205	492	492	276	1161	580	192	984	492
v/s Ratio Prot	c0.12	0.27		0.11	c0.34		c0.17	0.23		0.09	c0.24	
v/s Ratio Perm			0.06			0.02			0.04			0.02
v/c Ratio	1.05	1.04	0.21	0.94	1.25	0.06	1.02	0.72	0.12	0.83	0.88	0.09
Uniform Delay, d1	53.4	44.2	34.5	52.3	43.6	32.2	50.2	35.9	28.7	52.1	41.7	32.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	78.8	40.2	1.0	45.9	127.7	0.2	59.9	3.9	0.4	23.4	11.1	0.3
Delay (s)	132.2	84.4	35.5	98.2	171.3	32.4	110.1	39.8	29.1	75.5	52.8	32.8
Level of Service	F	F	D	F	F	C	F	D	C	E	D	C
Approach Delay (s)		81.7			140.4			52.8			53.2	
Approach LOS		F			F			D			D	

Intersection Summary

























HCM 2000 Control Delay	77.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	94.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/28/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	187	937	259	183	583	95	268	795	210	151	822	149
Future Volume (veh/h)	187	937	259	183	583	95	268	795	210	151	822	149
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	197	986	220	193	614	65	282	837	170	159	865	119
Adj No. of Lanes	1	2	1	1	1	1	2	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	179	2343	1035	196	1251	1064	337	1103	493	183	1168	522
Arrive On Green	0.11	0.69	0.69	0.12	0.70	0.70	0.11	0.32	0.32	0.11	0.34	0.34
Sat Flow, veh/h	1619	3420	1510	1619	1800	1530	3141	3420	1529	1619	3420	1530
Grp Volume(v), veh/h	197	986	220	193	614	65	282	837	170	159	865	119
Grp Sat Flow(s),veh/h/ln	1619	1710	1510	1619	1800	1530	1570	1710	1529	1619	1710	1530
Q Serve(g_s), s	13.3	15.3	6.4	14.3	18.9	2.8	10.6	26.3	13.5	11.6	26.8	6.7
Cycle Q Clear(g_c), s	13.3	15.3	6.4	14.3	18.9	2.8	10.6	26.3	13.5	11.6	26.8	6.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	179	2343	1035	196	1251	1064	337	1103	493	183	1168	522
V/C Ratio(X)	1.10	0.42	0.21	0.99	0.49	0.06	0.84	0.76	0.34	0.87	0.74	0.23
Avail Cap(c_a), veh/h	179	2343	1035	196	1251	1064	510	1103	493	183	1168	522
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.47	0.47	0.47	1.00	1.00	1.00	0.31	0.31	0.31	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.3	8.4	7.0	52.7	8.5	17.2	52.5	36.5	54.8	52.4	34.8	28.2
Incr Delay (d2), s/veh	74.9	0.3	0.2	60.2	1.4	0.1	1.5	1.6	0.6	32.3	4.3	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.7	7.2	2.7	9.6	9.9	1.2	4.7	12.7	5.8	6.8	13.3	3.0
LnGrp Delay(d),s/veh	128.2	8.6	7.2	112.8	9.8	17.3	54.0	38.0	55.4	84.7	39.1	29.2
LnGrp LOS	F	A	A	F	A	B	D	D	E	F	D	C
Approach Vol, veh/h		1403			872			1289			1143	
Approach Delay, s/veh		25.2			33.2			43.8			44.4	
Approach LOS		C			C			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.1	89.9	17.5	47.2	17.9	91.1	19.7	44.9				
Change Period (Y+Rc), s	4.6	6.2	4.6	6.2	4.6	6.2	6.2	* 6.2				
Max Green Setting (Gmax), s	14.5	31.6	19.5	32.8	13.3	32.8	13.6	* 39				
Max Q Clear Time (g_c+I1), s	16.3	17.3	12.6	28.8	15.3	20.9	13.6	28.3				
Green Ext Time (p_c), s	0.0	11.0	0.3	2.2	0.0	9.4	0.0	4.1				
Intersection Summary												
HCM 2010 Ctrl Delay			36.4									
HCM 2010 LOS			D									
Notes												

APPENDIX 7.10:

**EAPC (2018) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS
WITH IMPROVEMENTS**

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Timings

9: Waterman Av. & Orange Show Rd./Orange Show Rd.

3/28/2017

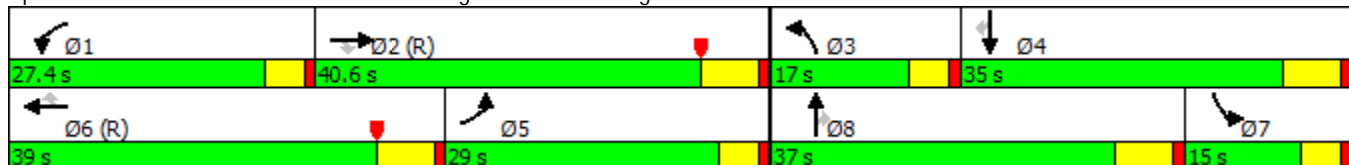


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑	↗	↘↗	↑↑	↗	↘	↑↑	↗
Traffic Volume (vph)	202	627	426	178	333	92	100	522	156	81	634	74
Future Volume (vph)	202	627	426	178	333	92	100	522	156	81	634	74
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.2	35.2	9.6	35.2	35.2	9.6	33.2	33.2	9.6	33.2	33.2
Total Split (s)	29.0	40.6	40.6	27.4	39.0	39.0	17.0	37.0	37.0	15.0	35.0	35.0
Total Split (%)	24.2%	33.8%	33.8%	22.8%	32.5%	32.5%	14.2%	30.8%	30.8%	12.5%	29.2%	29.2%
Yellow Time (s)	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Act Effect Green (s)	24.4	38.9	38.9	18.3	32.8	32.8	11.1	30.8	30.8	10.4	30.1	30.1
Actuated g/C Ratio	0.20	0.32	0.32	0.15	0.27	0.27	0.09	0.26	0.26	0.09	0.25	0.25
v/c Ratio	0.68	0.62	0.61	0.80	0.79	0.17	0.74	0.66	0.30	0.64	0.82	0.15
Control Delay	55.4	38.0	14.0	71.0	53.1	0.6	80.0	43.9	6.2	73.1	51.1	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.4	38.0	14.0	71.0	53.1	0.6	80.0	43.9	6.2	73.1	51.1	0.5
LOS	E	D	B	E	D	A	E	D	A	E	D	A
Approach Delay		32.6			50.4			41.0			48.6	
Approach LOS		C			D			D			D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 41.3
 Intersection LOS: D
 Intersection Capacity Utilization 71.7%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/28/2017



























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	202	627	426	178	333	92	100	522	156	81	634	74
Future Volume (vph)	202	627	426	178	333	92	100	522	156	81	634	74
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	235	729	495	207	387	107	116	607	181	94	737	86
RTOR Reduction (vph)	0	0	233	0	0	78	0	0	135	0	0	64
Lane Group Flow (vph)	235	729	262	207	387	29	116	607	46	94	737	22
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	NA	4
Permitted Phases			2			6			8			4
Actuated Green, G (s)	24.4	38.9	38.9	18.3	32.8	32.8	11.1	30.8	30.8	10.4	30.1	30.1
Effective Green, g (s)	24.4	38.9	38.9	18.3	32.8	32.8	11.1	30.8	30.8	10.4	30.1	30.1
Actuated g/C Ratio	0.20	0.32	0.32	0.15	0.27	0.27	0.09	0.26	0.26	0.09	0.25	0.25
Clearance Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	345	1167	583	259	492	492	157	924	462	147	903	451
v/s Ratio Prot	c0.14	0.20		0.12	c0.21		0.07	c0.17		0.06	c0.20	
v/s Ratio Perm			0.15			0.02			0.03			0.01
v/c Ratio	0.68	0.62	0.45	0.80	0.79	0.06	0.74	0.66	0.10	0.64	0.82	0.05
Uniform Delay, d1	44.2	34.4	32.1	49.1	40.4	32.2	53.0	39.9	34.0	53.0	42.3	34.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.4	2.5	2.5	14.7	12.0	0.2	14.4	3.6	0.4	6.6	8.1	0.2
Delay (s)	48.6	36.9	34.6	63.8	52.3	32.4	67.5	43.5	34.5	59.5	50.4	34.3
Level of Service	D	D	C	E	D	C	E	D	C	E	D	C
Approach Delay (s)		38.0			52.7			44.8			49.8	
Approach LOS		D			D			D			D	

Intersection Summary

HCM 2000 Control Delay	44.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	202	627	426	178	333	92	100	522	156	81	634	74
Future Volume (veh/h)	202	627	426	178	333	92	100	522	156	81	634	74
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	235	729	396	207	387	66	116	607	145	94	737	63
Adj No. of Lanes	1	2	1	1	1	1	2	2	1	1	2	1
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	311	1148	514	232	492	418	165	878	393	115	987	442
Arrive On Green	0.19	0.34	0.34	0.14	0.27	0.27	0.05	0.26	0.26	0.07	0.29	0.29
Sat Flow, veh/h	1619	3420	1530	1619	1800	1530	3141	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	235	729	396	207	387	66	116	607	145	94	737	63
Grp Sat Flow(s),veh/h/ln	1619	1710	1530	1619	1800	1530	1570	1710	1530	1619	1710	1530
Q Serve(g_s), s	16.5	21.6	27.8	15.1	23.9	3.9	4.4	19.2	6.4	6.9	23.5	2.1
Cycle Q Clear(g_c), s	16.5	21.6	27.8	15.1	23.9	3.9	4.4	19.2	6.4	6.9	23.5	2.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	311	1148	514	232	492	418	165	878	393	115	987	442
V/C Ratio(X)	0.75	0.63	0.77	0.89	0.79	0.16	0.70	0.69	0.37	0.82	0.75	0.14
Avail Cap(c_a), veh/h	329	1148	514	308	492	418	325	878	393	140	987	442
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.21	0.21	0.21	1.00	1.00	1.00	0.78	0.78	0.78	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.8	33.6	35.7	50.5	40.4	33.1	55.9	40.3	17.2	55.0	38.7	10.8
Incr Delay (d2), s/veh	1.8	0.6	2.4	18.6	12.0	0.8	1.6	3.5	2.1	21.7	5.1	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	10.3	12.1	7.9	13.5	1.7	1.9	9.5	2.9	3.8	11.8	1.0
LnGrp Delay(d),s/veh	47.6	34.2	38.2	69.1	52.3	33.9	57.5	43.8	19.3	76.7	43.9	11.5
LnGrp LOS	D	C	D	E	D	C	E	D	B	E	D	B
Approach Vol, veh/h		1360			660			868			894	
Approach Delay, s/veh		37.7			55.8			41.6			45.0	
Approach LOS		D			E			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	21.8	46.5	10.9	40.8	29.3	39.0	14.7	37.0				
Change Period (Y+Rc), s	4.6	6.2	4.6	6.2	6.2	* 6.2	6.2	* 6.2				
Max Green Setting (Gmax), s	22.8	34.4	12.4	28.8	24.4	* 33	10.4	* 31				
Max Q Clear Time (g_c+I1), s	17.1	29.8	6.4	25.5	18.5	25.9	8.9	21.2				
Green Ext Time (p_c), s	0.1	3.0	0.1	1.5	0.6	1.7	0.1	2.9				
Intersection Summary												
HCM 2010 Ctrl Delay			43.5									
HCM 2010 LOS			D									
Notes												

Timings

9: Waterman Av. & Orange Show Rd./Orange Show Rd.

3/28/2017

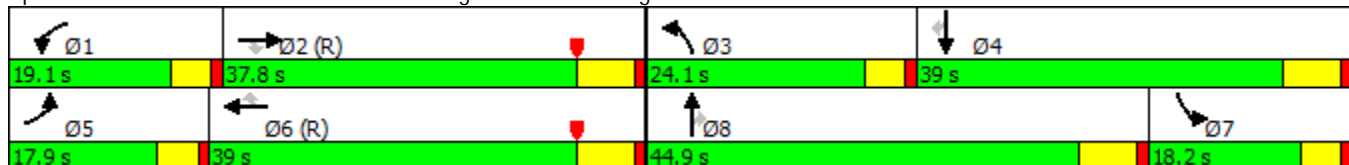


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗↗	↘	↘	↗	↘	↗↗	↗↗	↘	↘	↗↗	↘
Traffic Volume (vph)	187	937	274	187	583	95	303	797	219	151	823	149
Future Volume (vph)	187	937	274	187	583	95	303	797	219	151	823	149
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.2	35.2	9.6	35.2	35.2	9.6	33.2	33.2	9.6	33.2	33.2
Total Split (s)	17.9	37.8	37.8	19.1	39.0	39.0	24.1	44.9	44.9	18.2	39.0	39.0
Total Split (%)	14.9%	31.5%	31.5%	15.9%	32.5%	32.5%	20.1%	37.4%	37.4%	15.2%	32.5%	32.5%
Yellow Time (s)	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Act Effct Green (s)	13.3	31.6	31.6	14.5	32.8	32.8	19.5	38.7	38.7	13.6	32.8	32.8
Actuated g/C Ratio	0.11	0.26	0.26	0.12	0.27	0.27	0.16	0.32	0.32	0.11	0.27	0.27
v/c Ratio	1.05	1.04	0.44	0.96	1.25	0.16	1.16	0.72	0.31	0.83	0.88	0.26
Control Delay	130.3	83.4	9.1	106.4	165.3	0.6	147.8	40.2	4.9	84.7	53.3	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	130.3	83.4	9.1	106.4	165.3	0.6	147.8	40.2	4.9	84.7	53.3	6.4
LOS	F	F	A	F	F	A	F	D	A	F	D	A
Approach Delay		75.1			134.5			59.0			51.3	
Approach LOS		E			F			E			D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 14.1 (12%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.25
 Intersection Signal Delay: 75.8
 Intersection LOS: E
 Intersection Capacity Utilization 95.6%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/28/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	187	937	274	187	583	95	303	797	219	151	823	149
Future Volume (vph)	187	937	274	187	583	95	303	797	219	151	823	149
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	197	986	288	197	614	100	319	839	231	159	866	157
RTOR Reduction (vph)	0	0	183	0	0	73	0	0	157	0	0	113
Lane Group Flow (vph)	197	986	105	197	614	27	319	839	74	159	866	44
Confl. Peds. (#/hr)			1						1			
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	13.3	31.6	31.6	14.5	32.8	32.8	19.5	38.7	38.7	13.6	32.8	32.8
Effective Green, g (s)	13.3	31.6	31.6	14.5	32.8	32.8	19.5	38.7	38.7	13.6	32.8	32.8
Actuated g/C Ratio	0.11	0.26	0.26	0.12	0.27	0.27	0.16	0.32	0.32	0.11	0.27	0.27
Clearance Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	188	948	474	205	492	492	276	1161	580	192	984	492
v/s Ratio Prot	c0.12	0.27		0.12	c0.34		c0.19	0.23		0.09	c0.24	
v/s Ratio Perm			0.06			0.02			0.04			0.02
v/c Ratio	1.05	1.04	0.22	0.96	1.25	0.06	1.16	0.72	0.13	0.83	0.88	0.09
Uniform Delay, d1	53.4	44.2	34.6	52.5	43.6	32.2	50.2	35.9	28.7	52.1	41.7	32.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	78.8	40.2	1.1	51.2	127.7	0.2	103.0	3.9	0.5	23.4	11.1	0.4
Delay (s)	132.2	84.4	35.6	103.7	171.3	32.4	153.3	39.8	29.2	75.5	52.8	32.8
Level of Service	F	F	D	F	F	C	F	D	C	E	D	C
Approach Delay (s)		81.2			141.4			64.1			53.2	
Approach LOS		F			F			E			D	

























Intersection Summary		
HCM 2000 Control Delay	80.8	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.08	F
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	95.6%	21.6
Analysis Period (min)	15	ICU Level of Service
		F

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/28/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	187	937	274	187	583	95	303	797	219	151	823	149
Future Volume (veh/h)	187	937	274	187	583	95	303	797	219	151	823	149
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	197	986	235	197	614	65	319	839	180	159	866	119
Adj No. of Lanes	1	2	1	1	1	1	2	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	179	2343	1035	196	1251	1064	373	1103	493	183	1128	505
Arrive On Green	0.11	0.69	0.69	0.12	0.70	0.70	0.12	0.32	0.32	0.11	0.33	0.33
Sat Flow, veh/h	1619	3420	1510	1619	1800	1530	3141	3420	1529	1619	3420	1530
Grp Volume(v), veh/h	197	986	235	197	614	65	319	839	180	159	866	119
Grp Sat Flow(s),veh/h/ln	1619	1710	1510	1619	1800	1530	1570	1710	1529	1619	1710	1530
Q Serve(g_s), s	13.3	15.3	7.0	14.5	18.9	2.8	12.0	26.4	14.4	11.6	27.3	6.8
Cycle Q Clear(g_c), s	13.3	15.3	7.0	14.5	18.9	2.8	12.0	26.4	14.4	11.6	27.3	6.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	179	2343	1035	196	1251	1064	373	1103	493	183	1128	505
V/C Ratio(X)	1.10	0.42	0.23	1.01	0.49	0.06	0.86	0.76	0.37	0.87	0.77	0.24
Avail Cap(c_a), veh/h	179	2343	1035	196	1251	1064	510	1103	493	183	1128	505
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.44	0.44	0.44	1.00	1.00	1.00	0.24	0.24	0.24	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.3	8.4	7.0	52.8	8.5	17.2	51.9	36.5	55.2	52.4	36.1	29.2
Incr Delay (d2), s/veh	73.4	0.2	0.2	66.2	1.4	0.1	2.1	1.3	0.5	32.3	5.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.6	7.2	2.9	10.1	9.9	1.2	5.3	12.7	6.2	6.8	13.7	3.0
LnGrp Delay(d),s/veh	126.8	8.6	7.3	118.9	9.8	17.3	54.0	37.7	55.7	84.7	41.1	30.3
LnGrp LOS	F	A	A	F	A	B	D	D	E	F	D	C
Approach Vol, veh/h		1418			876			1338			1144	
Approach Delay, s/veh		24.8			34.9			44.0			46.1	
Approach LOS		C			C			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.1	89.9	18.9	45.8	17.9	91.1	19.7	44.9				
Change Period (Y+Rc), s	4.6	6.2	4.6	6.2	4.6	6.2	6.2	* 6.2				
Max Green Setting (Gmax), s	14.5	31.6	19.5	32.8	13.3	32.8	13.6	* 39				
Max Q Clear Time (g_c+I1), s	16.5	17.3	14.0	29.3	15.3	20.9	13.6	28.4				
Green Ext Time (p_c), s	0.0	11.0	0.3	1.9	0.0	9.4	0.0	4.1				
Intersection Summary												
HCM 2010 Ctrl Delay			37.1									
HCM 2010 LOS			D									
Notes												

APPENDIX 7.11:

EAC (2018) CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS

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BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Northbound
Agency or Company	Urban Crossroads, Inc.	From/To	North of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	EAC (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
Flow Inputs			
Volume, V	5534	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			3
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.985
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1526	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	68.8	x f _p)	
D = v _p / S	22.2	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Northbound
Agency or Company	Urban Crossroads, Inc.	From/To	South of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	EAC (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	7391	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			2
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	2029	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	62.0	x f _p)	
D = v _p / S	32.7	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Southbound
Agency or Company	Urban Crossroads, Inc.	From/To	North of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	EAC (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	6909	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			4
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
1532	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	68.7	x f _p)	
mph		S	
D = v _p / S	22.3	mph	
pc/mi/ln		D = v _p / S	
LOS	C	pc/mi/ln	
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Southbound
Agency or Company	Urban Crossroads, Inc.	From/To	South of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	EAC (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
Flow Inputs			
Volume, V	6825	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			4
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain: Level
			Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	1513	Design LOS	
S	68.9	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	22.0	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Eastbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	EAC (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	7463	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			10
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.952
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2129	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	60.0	x f _p)	
S	mph	S	mph
D = v _p / S	35.5	D = v _p / S	pc/mi/ln
35.5	pc/mi/ln	Required Number of Lanes, N	
LOS	E		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Eastbound
Agency or Company	Urban Crossroads, Inc.	From/To	East of Waterman
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	EAC (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	6736	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			11
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.948
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1545	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	68.6	x f _p)	
D = v _p / S	22.5	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Westbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	EAC (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
Flow Inputs			
Volume, V	8107	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			15
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.930
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2368	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	54.2	x f _p)	
mph		S	
D = v _p / S	43.7	mph	
pc/mi/ln		D = v _p / S	
LOS	E	pc/mi/ln	
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel <i>I-10 Westbound</i>	
Agency or Company	<i>Urban Crossroads, Inc.</i>	From/To	<i>East of Waterman</i>
Date Performed	<i>3/20/2017</i>	Jurisdiction	<i>Caltrans</i>
Analysis Time Period	<i>AM Peak Hour</i>	Analysis Year	<i>EAC (2018)</i>
Project Description <i>Gateway South Building 4 TIA (JN 10187)</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8854	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			13
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			<i>Level</i>
			Grade % Length
			<i>mi</i>
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	
0.939			
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph	mph	
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2562	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	48.5	x f _p)	
mph		S	mph
D = v _p / S	52.8	D = v _p / S	pc/mi/ln
pc/mi/ln		Required Number of Lanes, N	
LOS	F		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Northbound
Agency or Company	Urban Crossroads, Inc.	From/To	North of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	EAC (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	6781	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			1
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.995
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
1852	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	65.1	x f _p)	
mph		S	
D = v _p / S	28.5	mph	
pc/mi/ln		D = v _p / S	
LOS	D	pc/mi/ln	
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Northbound
Agency or Company	Urban Crossroads, Inc.	From/To	South of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	EAC (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	7900	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			2
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain: Level
			Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
x f _p)	2168	v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	59.1	x f _p)	mph
D = v _p / S	36.7	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Southbound
Agency or Company	Urban Crossroads, Inc.	From/To	North of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	EAC (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	5672	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			2
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
1245	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	70.0	x f _p)	
S	mph	S	mph
D = v _p / S	17.8	D = v _p / S	pc/mi/ln
17.8	pc/mi/ln	Required Number of Lanes, N	
LOS	B		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Southbound
Agency or Company	Urban Crossroads, Inc.	From/To	South of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	EAC (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	8514	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			3
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain: Level
			Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.985
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
1879	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	64.7	x f _p)	
D = v _p / S	29.1	S	
LOS	D	D = v _p / S	
		pc/mi/ln	
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Eastbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	EAC (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
Flow Inputs			
Volume, V	6555	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			8
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain: Level
			Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.962
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1853	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	65.1	x f _p)	
D = v _p / S	28.5	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Eastbound
Agency or Company	Urban Crossroads, Inc.	From/To	East of Waterman
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	EAC (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	6760	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			8
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.962
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
1528	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	68.8	x f _p)	
S	mph	S	mph
D = v _p / S	22.2	D = v _p / S	pc/mi/ln
22.2	pc/mi/ln	Required Number of Lanes, N	
LOS	C		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Westbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	EAC (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	8098	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			17
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.922
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2388	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	53.6	x f _p)	
mph		S	
D = v _p / S	44.5	mph	
pc/mi/ln		D = v _p / S	
LOS	E	pc/mi/ln	
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel <i>I-10 Westbound</i>	
Agency or Company	<i>Urban Crossroads, Inc.</i>	From/To	<i>East of Waterman</i>
Date Performed	<i>3/20/2017</i>	Jurisdiction	<i>Caltrans</i>
Analysis Time Period	<i>PM Peak Hour</i>	Analysis Year	<i>EAC (2018)</i>
Project Description <i>Gateway South Building 4 TIA (JN 10187)</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	7330	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			18
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			<i>Level</i>
			Grade % Length
			<i>mi</i>
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	
0.917			
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2171	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	59.1	x f _p)	
S	mph	S	mph
D = v _p / S	36.8	D = v _p / S	pc/mi/ln
36.8	pc/mi/ln	Required Number of Lanes, N	
LOS	E		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

APPENDIX 7.12:

EAPC (2018) CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS

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BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Northbound
Agency or Company	Urban Crossroads, Inc.	From/To	North of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	EAPC (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	5544	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			3
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain: Level
			Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.985
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
1529	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	68.7	x f _p)	
S	mph	S	mph
D = v _p / S	22.2	D = v _p / S	pc/mi/ln
22.2	pc/mi/ln	Required Number of Lanes, N	
LOS	C		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Northbound
Agency or Company	Urban Crossroads, Inc.	From/To	South of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	EAPC (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	7419	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			3
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2046	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	61.7	x f _p)	
S	mph	S	mph
D = v _p / S	33.2	D = v _p / S	pc/mi/ln
33.2	pc/mi/ln	Required Number of Lanes, N	
LOS	D		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Southbound
Agency or Company	Urban Crossroads, Inc.	From/To	North of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	EAPC (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6933	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			4
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	1537	Design LOS	
S	68.7	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	22.4	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Southbound
Agency or Company	Urban Crossroads, Inc.	From/To	South of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	EAPC (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	6837	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			4
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	1516	Design LOS	
S	68.8	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	22.0	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Eastbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	EAPC (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	7490	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			10
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.952
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2137	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	59.8	x f _p)	
S	mph	S	mph
D = v _p / S	35.7	D = v _p / S	pc/mi/ln
pc/mi/ln		Required Number of Lanes, N	
LOS	E		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Eastbound
Agency or Company	Urban Crossroads, Inc.	From/To	East of Waterman
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	EAPC (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6746	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			11
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.948
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1547	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	68.6	x f _p)	
D = v _p / S	22.5	S	mph
LOS	C	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Westbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	4/3/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	EAPC (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
Flow Inputs			
Volume, V	8113	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			15
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.930
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	2370	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	54.1	x f _p)	
D = v _p / S	43.8	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel <i>I-10 Westbound</i>	
Agency or Company	<i>Urban Crossroads, Inc.</i>	From/To	<i>East of Waterman</i>
Date Performed	<i>3/20/2017</i>	Jurisdiction	<i>Caltrans</i>
Analysis Time Period	<i>AM Peak Hour</i>	Analysis Year	<i>EAPC (2018)</i>
Project Description <i>Gateway South Building 4 TIA (JN 10187)</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8878	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			14
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	
0.935			
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2581	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	47.9	x f _p)	
S	mph	S	mph
D = v _p / S	53.9	D = v _p / S	pc/mi/ln
pc/mi/ln		Required Number of Lanes, N	
LOS	F		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Northbound
Agency or Company	Urban Crossroads, Inc.	From/To	North of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	EAPC (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6809	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			1
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.995
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
1860	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	64.9	x f _p)	
S	mph	S	mph
D = v _p / S	28.6	D = v _p / S	pc/mi/ln
28.6	pc/mi/ln	Required Number of Lanes, N	
LOS	D		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Northbound
Agency or Company	Urban Crossroads, Inc.	From/To	South of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	EAPC (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
Flow Inputs			
Volume, V	7915	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			2
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain: Level
			Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	2172	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	59.0	x f _p)	
D = v _p / S	36.8	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Southbound
Agency or Company	Urban Crossroads, Inc.	From/To	North of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	EAPC (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	5684	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			2
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain: Level
			Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	1248 pc/h/ln	Design LOS	
S	70.0 mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	17.8 pc/mi/ln	S	mph
LOS	B	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Southbound
Agency or Company	Urban Crossroads, Inc.	From/To	South of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	EAPC (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	8547	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			3
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain: Level
			Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.985
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1886	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	64.5	x f _p)	
D = v _p / S	29.2	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Eastbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	EAPC (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
Flow Inputs			
Volume, V	6570	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			8
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.962
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1857	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	65.0	x f _p)	
D = v _p / S	28.6	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel <i>I-10 Eastbound</i>	
Agency or Company	<i>Urban Crossroads, Inc.</i>	From/To	<i>East of Waterman</i>
Date Performed	<i>3/20/2017</i>	Jurisdiction	<i>Caltrans</i>
Analysis Time Period	<i>PM Peak Hour</i>	Analysis Year	<i>EAPC (2018)</i>
Project Description <i>Gateway South Building 4 TIA (JN 10187)</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	6789	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			8
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			<i>Level</i>
			Grade % Length
			<i>mi</i>
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	
0.962			
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
1535	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	68.7	x f _p)	
S	mph	S	mph
D = v _p / S	22.3	D = v _p / S	pc/mi/ln
22.3	pc/mi/ln	Required Number of Lanes, N	
LOS	C		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Westbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	4/3/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	EAPC (2018)
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	8115	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			16
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.926
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2382	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	53.8	x f _p)	
mph		S	
D = v _p / S	44.3	mph	
pc/mi/ln		D = v _p / S	
LOS	E	pc/mi/ln	
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel <i>I-10 Westbound</i>	
Agency or Company	<i>Urban Crossroads, Inc.</i>	From/To	<i>East of Waterman</i>
Date Performed	<i>3/20/2017</i>	Jurisdiction	<i>Caltrans</i>
Analysis Time Period	<i>PM Peak Hour</i>	Analysis Year	<i>EAPC (2018)</i>
Project Description <i>Gateway South Building 4 TIA (JN 10187)</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	7343	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			18
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			<i>Level</i>
			Grade % Length
			<i>mi</i>
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	
0.917			
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	2175	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	59.0	x f _p)	
D = v _p / S	36.9	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

APPENDIX 7.13:

EAC (2018) CONDITIONS RAMP JUNCTION ANALYSIS WORKSHEETS

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RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information				Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound	Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Auto Center	Date Performed	3/20/2017
Date Performed	3/20/2017	Jurisdiction	Caltrans	Analysis Time Period	AM Peak Hour	Analysis Year	EAC (2018)	Project Description	Gateway South Building 4 TIA (JN 10187)
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp	Freeway Volume, V _F	5214	Downstream Adj Ramp	Freeway Free-Flow Speed, S _{FF}	65.0	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Volume, V _R	320	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Ramp Free-Flow Speed, S _{FR}	45.0	
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	240	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	L _{up} =	1840 ft	L _{down} =		ft	
	Deceleration Lane Length L _D			V _u =	974 veh/h	V _D =		veh/h	
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5214	0.92	Level	2	0	0.990	1.00	5724	
Ramp	320	0.92	Level	17	0	0.922	1.00	377	
UpStream	974	0.92	Level	2	0	0.990	1.00	1069	
DownStream									
Merge Areas				Diverge Areas					
Estimation of v₁₂				Estimation of v₁₂					
L _{EQ} =	V ₁₂ = V _F (P _{FM}) (Equation 13-6 or 13-7)			L _{EQ} =	V ₁₂ = V _R + (V _F - V _R)P _{FD} (Equation 13-12 or 13-13)				
P _{FM} =	0.171 using Equation (Exhibit 13-6)			P _{FD} =	using Equation (Exhibit 13-7)				
V ₁₂ =	977 pc/h			V ₁₂ =	pc/h				
V ₃ or V _{av34}	2373 pc/h (Equation 13-14 or 13-17)			V ₃ or V _{av34}	pc/h (Equation 13-14 or 13-17)				
Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No				
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, V _{12a} =	2289 pc/h (Equation 13-16, 13-18, or 13-19)			If Yes, V _{12a} =	pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks				Capacity Checks					
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?		
V _{FO}	6101	Exhibit 13-8	No	V _F		Exhibit 13-8			
				V _{FO} = V _F - V _R		Exhibit 13-8			
				V _R		Exhibit 13-10			
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area					
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?		
V _{R12}	2666	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8			
Level of Service Determination (if not F)				Level of Service Determination (if not F)					
D _R =	5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A			D _R =	4.252 + 0.0086 V ₁₂ - 0.009 L _D				
D _R =	24.6 (pc/mi/ln)			D _R =	(pc/mi/ln)				
LOS =	C (Exhibit 13-2)			LOS =	(Exhibit 13-2)				
Speed Determination				Speed Determination					
M _S =	0.355 (Exhibit 13-11)			D _s =	(Exhibit 13-12)				
S _R =	56.8 mph (Exhibit 13-11)			S _R =	mph (Exhibit 13-12)				
S ₀ =	60.6 mph (Exhibit 13-11)			S ₀ =	mph (Exhibit 13-12)				
S =	58.9 mph (Exhibit 13-13)			S =	mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	EAC (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	4	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Freeway Volume, V _F	6188	L _{down} =	1260 ft	Freeway Free-Flow Speed, S _{FF}	65.0
L _{up} =	Ramp Number of Lanes, N	2	V _D =	Ramp Volume, V _R	1203			Ramp Free-Flow Speed, S _{FR}	45.0
V _u =	Acceleration Lane Length, L _A			Freeway Free-Flow Speed, S _{FF}	65.0				
	Deceleration Lane Length L _D	975		Ramp Free-Flow Speed, S _{FR}	45.0				
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6188	0.92	Level	2	0	0.990	1.00	6793	
Ramp	1203	0.92	Level	5	0	0.976	1.00	1340	
UpStream									
DownStream	974	0.92	Level	2	0	0.990	1.00	1069	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 2758 pc/h V ₃ or V _{av34} 2017 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	6793	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	5453	Exhibit 13-8	9400	No
					V _R	1340	Exhibit 13-10	4200	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	2758	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 8.9 (pc/mi/ln) LOS = A (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S =	(Exhibit 13-11)				D _S =	0.419 (Exhibit 13-12)			
S _R =	mph (Exhibit 13-11)				S _R =	55.4 mph (Exhibit 13-12)			
S ₀ =	mph (Exhibit 13-11)				S ₀ =	67.3 mph (Exhibit 13-12)			
S =	mph (Exhibit 13-13)				S =	61.9 mph (Exhibit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	EAC (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N	5	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 1790 ft V _D = 709 veh/h	Ramp Number of Lanes, N	1	Acceleration Lane Length, L _A		Deceleration Lane Length L _D	180
	Freeway Volume, V _F	5386		Ramp Volume, V _R	1523	Freeway Free-Flow Speed, S _{FF}	65.0	Ramp Free-Flow Speed, S _{FR}	45.0
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5386	0.92	Level	4	0	0.980	1.00	5971	
Ramp	1523	0.92	Level	2	0	0.990	1.00	1672	
UpStream									
DownStream	709	0.92	Level	6	0	0.971	1.00	794	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 3156 pc/h V ₃ or V _{av34} 960 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	5076	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	3404	Exhibit 13-8	9400	No
					V _R	1672	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	3156	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 29.8 (pc/mi/ln) LOS = D (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11)					D _S = 0.448 (Exhibit 13-12)				
S _R = mph (Exhibit 13-11)					S _R = 54.7 mph (Exhibit 13-12)				
S ₀ = mph (Exhibit 13-11)					S ₀ = 71.3 mph (Exhibit 13-12)				
S = mph (Exhibit 13-13)					S = 60.0 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Upstream)						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	EAC (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N = 4				Downstream Adj Ramp				
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N = 1				<input type="checkbox"/> Yes <input type="checkbox"/> On				
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A = 200				<input checked="" type="checkbox"/> No <input type="checkbox"/> Off				
L _{up} = 1070 ft	Deceleration Lane Length L _D				L _{down} = ft				
V _u = 709 veh/h	Freeway Volume, V _F = 6095				V _D = veh/h				
	Ramp Volume, V _R = 252								
	Freeway Free-Flow Speed, S _{FF} = 65.0								
	Ramp Free-Flow Speed, S _{FR} = 45.0								
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6095	0.92	Level	4	0	0.980	1.00	6757	
Ramp	252	0.92	Level	15	0	0.930	1.00	294	
UpStream	709	0.92	Level	6	0	0.971	1.00	794	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.181 using Equation (Exhibit 13-6) V ₁₂ = 1223 pc/h V ₃ or V _{av34} = 2767 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2702 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	7051	Exhibit 13-8		No	V _F		Exhibit 13-8		
					V _{FO} = V _F - V _R		Exhibit 13-8		
					V _R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	2996	Exhibit 13-8	4600:All	No	V ₁₂		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 27.5 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = 0.381 (Exhibit 13-11)					D _s = (Exhibit 13-12)				
S _R = 56.2 mph (Exhibit 13-11)					S _R = mph (Exhibit 13-12)				
S ₀ = 59.5 mph (Exhibit 13-11)					S ₀ = mph (Exhibit 13-12)				
S = 58.1 mph (Exhibit 13-13)					S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information				Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Downstream)						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	EAC (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N	5				Downstream Adj Ramp			
	Ramp Number of Lanes, N	1				<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On			
	Acceleration Lane Length, L _A	200				<input type="checkbox"/> No <input type="checkbox"/> Off			
	Deceleration Lane Length L _D					L _{down} = 1115 ft			
	Freeway Volume, V _F	6732				V _D = 93 veh/h			
	Ramp Volume, V _R	252							
	Freeway Free-Flow Speed, S _{FF}	65.0							
Ramp Free-Flow Speed, S _{FR}	45.0								
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6732	0.92	Level	4	0	0.980	1.00	7464	
Ramp	252	0.92	Level	15	0	0.930	1.00	294	
UpStream									
DownStream	93	0.92	Level	6	0	0.971	1.00	104	
Merge Areas				Diverge Areas					
Estimation of v ₁₂				Estimation of v ₁₂					
V ₁₂ = V _F (P _{FM}) (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.181 using Equation (Exhibit 13-6) V ₁₂ = 987 pc/h V ₃ or V _{av34} = 2231 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2179 pc/h (Equation 13-16, 13-18, or 13-19)				V ₁₂ = V _R + (V _F - V _R)P _{FD} (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks				Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	5743	Exhibit 13-8		No	V _F		Exhibit 13-8		
					V _{FO} = V _F - V _R		Exhibit 13-8		
					V _R		Exhibit 13-10		
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	2473	Exhibit 13-8	4600:All	No	V ₁₂		Exhibit 13-8		
Level of Service Determination (if not F)				Level of Service Determination (if not F)					
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A D _R = 23.4 (pc/mi/ln) LOS = C (Exhibit 13-2)				D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					
Speed Determination				Speed Determination					
M _S =	0.349 (Exhibit 13-11)			D _s =	(Exhibit 13-12)				
S _R =	57.0 mph (Exhibit 13-11)			S _R =	mph (Exhibit 13-12)				
S ₀ =	60.9 mph (Exhibit 13-11)			S ₀ =	mph (Exhibit 13-12)				
S =	59.1 mph (Exhibit 13-13)			S =	mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst	BA	Freeway/Dir of Travel	I-10 Eastbound							
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Waterman							
Date Performed	3/20/2017	Jurisdiction	Caltrans							
Analysis Time Period	AM Peak Hour	Analysis Year	EAC (2018)							
Project Description Gateway South Building 4 TIA (JN 10187)										
Inputs										
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N Ramp Number of Lanes, N Acceleration Lane Length, L _A Deceleration Lane Length L _D Freeway Volume, V _F Ramp Volume, V _R Freeway Free-Flow Speed, S _{FF} Ramp Free-Flow Speed, S _{FR}	4 1 1500 6310 1153 65.0 45.0					Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	L _{down} = 2950 ft V _D = 426 veh/h		
L _{up} = ft V _u = veh/h										
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	6310	0.92	Level	11	0	0.948	1.00	7236		
Ramp	1153	0.92	Level	3	0	0.985	1.00	1272		
UpStream										
DownStream	426	0.92	Level	7	0	0.966	1.00	479		
Merge Areas					Diverge Areas					
Estimation of v ₁₂					Estimation of v ₁₂					
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 3872 pc/h V ₃ or V _{av34} 1682 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 13-8			V _F	7236	Exhibit 13-8	9400	No	
					V _{FO} = V _F - V _R	5964	Exhibit 13-8	9400	No	
					V _R	1272	Exhibit 13-10	2100	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	3872	Exhibit 13-8	4400:All	No	
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 24.1 (pc/mi/ln) LOS = C (Exhibit 13-2)					
Speed Determination					Speed Determination					
M _S = (Exhibit 13-11) S _R = mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-11) S = mph (Exhibit 13-13)					D _S = 0.412 (Exhibit 13-12) S _R = 55.5 mph (Exhibit 13-12) S ₀ = 68.6 mph (Exhibit 13-12) S = 60.9 mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Eastbound						
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	EAC (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp						
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On						
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	1500	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off						
L _{up} = 2950 ft	Deceleration Lane Length L _D		L _{down} = ft						
V _u = 1153 veh/h	Freeway Volume, V _F	6310	V _D = veh/h						
	Ramp Volume, V _R	426							
	Freeway Free-Flow Speed, S _{FF}	65.0							
	Ramp Free-Flow Speed, S _{FR}	45.0							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6310	0.92	Level	11	0	0.948	1.00	7236	
Ramp	426	0.92	Level	7	0	0.966	1.00	479	
UpStream	1153	0.92	Level	3	0	0.985	1.00	1272	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.158 using Equation (Exhibit 13-6) V ₁₂ = 1143 pc/h V ₃ or V _{av34} = 3046 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2894 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity	LOS F?			Actual	Capacity	LOS F?	
V _{FO}	7715	Exhibit 13-8	No		V _F	Exhibit 13-8			
					V _{FO} = V _F - V _R	Exhibit 13-8			
					V _R	Exhibit 13-10			
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}	3373	Exhibit 13-8	4600:All		No	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 22.2 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = 0.300 (Exhibit 13-11)					D _s = (Exhibit 13-12)				
S _R = 58.1 mph (Exhibit 13-11)					S _R = mph (Exhibit 13-12)				
S ₀ = 59.0 mph (Exhibit 13-11)					S ₀ = mph (Exhibit 13-12)				
S = 58.6 mph (Exhibit 13-13)					S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET								
General Information				Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Westbound					
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman					
Date Performed	3/20/2017	Jurisdiction	Caltrans					
Analysis Time Period	AM Peak Hour	Analysis Year	EAC (2018)					
Project Description Gateway South Building 4 TIA (JN 10187)								
Inputs								
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp					
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On					
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	1500	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off					
L _{up} = 1815 ft	Deceleration Lane Length L _D		L _{down} = ft					
V _u = 1067 veh/h	Freeway Volume, V _F	7787	V _D = veh/h					
	Ramp Volume, V _R	320						
	Freeway Free-Flow Speed, S _{FF}	65.0						
	Ramp Free-Flow Speed, S _{FR}	45.0						
Conversion to pc/h Under Base Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	7787	0.92	Level	15	0	0.930	1.00	9099
Ramp	320	0.92	Level	7	0	0.966	1.00	360
UpStream	1067	0.92	Level	3	0	0.985	1.00	1177
DownStream								
Merge Areas				Diverge Areas				
Estimation of v ₁₂				Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.173 using Equation (Exhibit 13-6) V ₁₂ = 1572 pc/h V ₃ or V _{av34} = 3763 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 3699 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?	Actual	Capacity	LOS F?		
V _{FO}	9459	Exhibit 13-8	Yes	V _F	Exhibit 13-8			
				V _{FO} = V _F - V _R	Exhibit 13-8			
				V _R	Exhibit 13-10			
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?	Actual	Max Desirable	Violation?		
V _{R12}	4059	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)				Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 27.6 (pc/mi/ln) LOS = F (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination				Speed Determination				
M _S = 0.412 (Exhibit 13-11)				D _s = (Exhibit 13-12)				
S _R = 55.5 mph (Exhibit 13-11)				S _R = mph (Exhibit 13-12)				
S ₀ = 56.1 mph (Exhibit 13-11)				S ₀ = mph (Exhibit 13-12)				
S = 55.8 mph (Exhibit 13-13)				S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst	BA	Freeway/Dir of Travel	I-10 Westbound							
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Waterman							
Date Performed	3/20/2017	Jurisdiction	Caltrans							
Analysis Time Period	AM Peak Hour	Analysis Year	EAC (2018)							
Project Description Gateway South Building 4 TIA (JN 10187)										
Inputs										
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N Ramp Number of Lanes, N Acceleration Lane Length, L _A Deceleration Lane Length L _D Freeway Volume, V _F Ramp Volume, V _R Freeway Free-Flow Speed, S _{FF} Ramp Free-Flow Speed, S _{FR}	4 1 1500 7787 1067 65.0 45.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	L _{down} = 1815 ft V _D = 320 veh/h						L _{up} = ft V _u = veh/h
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	7787	0.92	Level	15	0	0.930	1.00	9099		
Ramp	1067	0.92	Level	3	0	0.985	1.00	1177		
UpStream										
DownStream	320	0.92	Level	7	0	0.966	1.00	360		
Merge Areas					Diverge Areas					
Estimation of v ₁₂					Estimation of v ₁₂					
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 4631 pc/h V ₃ or V _{av34} 2234 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 13-8			V _F	9099	Exhibit 13-8	9400	No	
					V _{FO} = V _F - V _R	7922	Exhibit 13-8	9400	No	
					V _R	1177	Exhibit 13-10	2100	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?		
V _{R12}		Exhibit 13-8			V ₁₂	4631	Exhibit 13-8	4400:All	Yes	
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 30.6 (pc/mi/ln) LOS = D (Exhibit 13-2)					
Speed Determination					Speed Determination					
M _S = (Exhibit 13-11)					D _S = 0.404 (Exhibit 13-12)					
S _R = mph (Exhibit 13-11)					S _R = 55.7 mph (Exhibit 13-12)					
S ₀ = mph (Exhibit 13-11)					S ₀ = 66.5 mph (Exhibit 13-12)					
S = mph (Exhibit 13-13)					S = 60.5 mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information				Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound	Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Auto Center	Date Performed	3/20/2017
Date Performed	3/20/2017	Jurisdiction	Caltrans	Analysis Time Period	PM Peak Hour	Analysis Year	EAC (2018)	Project Description Gateway South Building 4 TIA (JN 10187)	
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp	Freeway Volume, V _F	5856				
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Volume, V _R	925				
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	240	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Free-Flow Speed, S _{FF}	65.0				
L _{up} = 1840 ft	Deceleration Lane Length L _D		L _{down} = ft	Ramp Free-Flow Speed, S _{FR}	45.0				
V _u = 925 veh/h			V _D = veh/h						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5856	0.92	Level	1	0	0.995	1.00	6397	
Ramp	925	0.92	Level	2	0	0.990	1.00	1015	
UpStream	925	0.92	Level	2	0	0.990	1.00	1015	
DownStream									
Merge Areas				Diverge Areas					
Estimation of v₁₂				Estimation of v₁₂					
L _{EQ} =	V ₁₂ = V _F (P _{FM})	(Equation 13-6 or 13-7)			L _{EQ} =	V ₁₂ = V _R + (V _F - V _R)P _{FD}	(Equation 13-12 or 13-13)		
P _{FM} =	0.091	using Equation (Exhibit 13-6)			P _{FD} =		using Equation (Exhibit 13-7)		
V ₁₂ =	582	pc/h			V ₁₂ =		pc/h		
V ₃ or V _{av34}	2907	pc/h (Equation 13-14 or 13-17)			V ₃ or V _{av34}		pc/h (Equation 13-14 or 13-17)		
Is V ₃ or V _{av34} > 2,700 pc/h?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No			
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input type="checkbox"/> Yes <input type="checkbox"/> No			
If Yes, V _{12a} =	2558	pc/h (Equation 13-16, 13-18, or 13-19)			If Yes, V _{12a} =		pc/h (Equation 13-16, 13-18, or 13-19)		
Capacity Checks				Capacity Checks					
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?		
V _{FO}	7412	Exhibit 13-8	No	V _F		Exhibit 13-8			
				V _{FO} = V _F - V _R		Exhibit 13-8			
				V _R		Exhibit 13-10			
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area					
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?		
V _{R12}	3573	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8			
Level of Service Determination (if not F)				Level of Service Determination (if not F)					
D _R =	5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A			D _R =	4.252 + 0.0086 V ₁₂ - 0.009 L _D				
D _R =	31.4 (pc/mi/ln)			D _R =	(pc/mi/ln)				
LOS =	D (Exhibit 13-2)			LOS =	(Exhibit 13-2)				
Speed Determination				Speed Determination					
M _S =	0.438 (Exhibit 13-11)			D _s =	(Exhibit 13-12)				
S _R =	54.9 mph (Exhibit 13-11)			S _R =	mph (Exhibit 13-12)				
S ₀ =	59.9 mph (Exhibit 13-11)			S ₀ =	mph (Exhibit 13-12)				
S =	57.4 mph (Exhibit 13-13)			S =	mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound							
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center							
Date Performed	3/20/2017	Jurisdiction	Caltrans							
Analysis Time Period	PM Peak Hour	Analysis Year	EAC (2018)							
Project Description Gateway South Building 4 TIA (JN 10187)										
Inputs										
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	4	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Freeway Volume, V _F	6780	L _{down} =	1260 ft	Freeway Free-Flow Speed, S _{FF}	65.0	
L _{up} =	Ramp Number of Lanes, N	2	V _D =	Ramp Volume, V _R	1120			Ramp Free-Flow Speed, S _{FR}	45.0	
V _u =	Acceleration Lane Length, L _A			Freeway Free-Flow Speed, S _{FF}	65.0					
	Deceleration Lane Length L _D	975		Ramp Free-Flow Speed, S _{FR}	45.0					
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	6780	0.92	Level	1	0	0.995	1.00	7406		
Ramp	1120	0.92	Level	5	0	0.976	1.00	1248		
UpStream										
DownStream	925	0.92	Level	2	0	0.990	1.00	1015		
Merge Areas					Diverge Areas					
Estimation of v ₁₂					Estimation of v ₁₂					
L _{EQ} =	V ₁₂ = V _F (P _{FM}) (Equation 13-6 or 13-7)				L _{EQ} =	V ₁₂ = V _R + (V _F - V _R)P _{FD} (Equation 13-12 or 13-13)				
P _{FM} =	using Equation (Exhibit 13-6)				P _{FD} =	0.260 using Equation (Exhibit 13-7)				
V ₁₂ =	pc/h				V ₁₂ =	2849 pc/h				
V ₃ or V _{av34}	pc/h (Equation 13-14 or 13-17)				V ₃ or V _{av34}	2278 pc/h (Equation 13-14 or 13-17)				
Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, V _{12a} =	pc/h (Equation 13-16, 13-18, or 13-19)				If Yes, V _{12a} =	2962 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 13-8			V _F	7406	Exhibit 13-8		9400	No
					V _{FO} = V _F - V _R	6158	Exhibit 13-8		9400	No
					V _R	1248	Exhibit 13-10		4200	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	2849	Exhibit 13-8		4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
D _R =	5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A				D _R =	4.252 + 0.0086 V ₁₂ - 0.009 L _D				
D _R =	(pc/mi/ln)				D _R =	10.6 (pc/mi/ln)				
LOS =	(Exhibit 13-2)				LOS =	B (Exhibit 13-2)				
Speed Determination					Speed Determination					
M _S =	(Exhibit 13-11)				D _S =	0.410 (Exhibit 13-12)				
S _R =	mph (Exhibit 13-11)				S _R =	55.6 mph (Exhibit 13-12)				
S ₀ =	mph (Exhibit 13-11)				S ₀ =	66.5 mph (Exhibit 13-12)				
S =	mph (Exhibit 13-13)				S =	61.7 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET											
General Information					Site Information						
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound								
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center								
Date Performed	3/20/2017	Jurisdiction	Caltrans								
Analysis Time Period	PM Peak Hour	Analysis Year	EAC (2018)								
Project Description Gateway South Building 4 TIA (JN 10187)											
Inputs											
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	5	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	Freeway Volume, V _F	4751	L _{down} =	1790 ft	Freeway Free-Flow Speed, S _{FF}	65.0	V _D =	1079 veh/h
L _{up} =	ft	Ramp Number of Lanes, N	1	Ramp Volume, V _R	921	Ramp Free-Flow Speed, S _{FR}	45.0				
V _u =	veh/h	Acceleration Lane Length, L _A		Freeway Free-Flow Speed, S _{FF}	65.0						
		Deceleration Lane Length L _D	180	Ramp Free-Flow Speed, S _{FR}	45.0						
Conversion to pc/h Under Base Conditions											
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p			
Freeway	4751	0.92	Level	1	0	0.995	1.00	5190			
Ramp	921	0.92	Level	6	0	0.971	1.00	1031			
UpStream											
DownStream	1079	0.92	Level	3	0	0.985	1.00	1190			
Merge Areas					Diverge Areas						
Estimation of v ₁₂					Estimation of v ₁₂						
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 2618 pc/h V ₃ or V _{av34} 1026 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)						
Capacity Checks					Capacity Checks						
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?		
V _{FO}		Exhibit 13-8			V _F	4671	Exhibit 13-8	9400	No		
					V _{FO} = V _F - V _R	3640	Exhibit 13-8	9400	No		
					V _R	1031	Exhibit 13-10	2100	No		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area						
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?			
V _{R12}		Exhibit 13-8			V ₁₂	2618	Exhibit 13-8	4400:All	No		
Level of Service Determination (if not F)					Level of Service Determination (if not F)						
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 25.1 (pc/mi/ln) LOS = C (Exhibit 13-2)						
Speed Determination					Speed Determination						
M _S =	(Exhibit 13-11)				D _S =	0.391 (Exhibit 13-12)					
S _R =	mph (Exhibit 13-11)				S _R =	56.0 mph (Exhibit 13-12)					
S ₀ =	mph (Exhibit 13-11)				S ₀ =	71.2 mph (Exhibit 13-12)					
S =	mph (Exhibit 13-13)				S =	61.8 mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Upstream)						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	EAC (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N		4		Downstream Adj Ramp				
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N		1		<input type="checkbox"/> Yes <input type="checkbox"/> On				
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A		200		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off				
L _{up} = 1070 ft	Deceleration Lane Length L _D				L _{down} = ft				
V _u = 1079 veh/h	Freeway Volume, V _F		5831		V _D = veh/h				
	Ramp Volume, V _R		700						
	Freeway Free-Flow Speed, S _{FF}		65.0						
	Ramp Free-Flow Speed, S _{FR}		45.0						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5831	0.92	Level	2	0	0.990	1.00	6401	
Ramp	700	0.92	Level	5	0	0.976	1.00	780	
UpStream	1079	0.92	Level	3	0	0.985	1.00	1190	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.120 using Equation (Exhibit 13-6) V ₁₂ = 770 pc/h V ₃ or V _{av34} = 2815 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2560 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	7181	Exhibit 13-8		No	V _F		Exhibit 13-8		
					V _{FO} = V _F - V _R		Exhibit 13-8		
					V _R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	3340	Exhibit 13-8	4600:All	No	V ₁₂		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 29.9 (pc/mi/ln) LOS = D (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = 0.413 (Exhibit 13-11)					D _s = (Exhibit 13-12)				
S _R = 55.5 mph (Exhibit 13-11)					S _R = mph (Exhibit 13-12)				
S ₀ = 59.9 mph (Exhibit 13-11)					S ₀ = mph (Exhibit 13-12)				
S = 57.8 mph (Exhibit 13-13)					S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information				Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Downstream)						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	EAC (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N	5					Downstream Adj Ramp		
	Ramp Number of Lanes, N	1					<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On		
	Acceleration Lane Length, L _A	200					<input type="checkbox"/> No <input type="checkbox"/> Off		
	Deceleration Lane Length L _D						L _{down} = 1115 ft		
	Freeway Volume, V _F	8244					V _D = 270 veh/h		
	Ramp Volume, V _R	700							
	Freeway Free-Flow Speed, S _{FF}	65.0							
Ramp Free-Flow Speed, S _{FR}	45.0								
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	8244	0.92	Level	2	0	0.990	1.00	9050	
Ramp	700	0.92	Level	5	0	0.976	1.00	780	
UpStream									
DownStream	270	0.92	Level	5	0	0.976	1.00	301	
Merge Areas				Diverge Areas					
Estimation of v ₁₂				Estimation of v ₁₂					
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.120 using Equation (Exhibit 13-6) V ₁₂ = 788 pc/h V ₃ or V _{av34} = 2881 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2620 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = V ₃ or V _{av34} = Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks				Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	7330	Exhibit 13-8		No	V _F		Exhibit 13-8		
					V _{FO} = V _F - V _R		Exhibit 13-8		
					V _R		Exhibit 13-10		
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	3400	Exhibit 13-8	4600:All	No	V ₁₂		Exhibit 13-8		
Level of Service Determination (if not F)				Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 30.4 (pc/mi/ln) LOS = D (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					
Speed Determination				Speed Determination					
M _S = 0.420 (Exhibit 13-11)				D _s = (Exhibit 13-12)					
S _R = 55.3 mph (Exhibit 13-11)				S _R = mph (Exhibit 13-12)					
S ₀ = 59.7 mph (Exhibit 13-11)				S ₀ = mph (Exhibit 13-12)					
S = 57.6 mph (Exhibit 13-13)				S = mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Eastbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Waterman						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	EAC (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N				4	Downstream Adj Ramp			
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N				1	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On			
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A					<input type="checkbox"/> No <input type="checkbox"/> Off			
L _{up} = ft	Deceleration Lane Length L _D				1500	L _{down} = 2950 ft			
V _u = veh/h	Freeway Volume, V _F				5875	V _D = 885 veh/h			
	Ramp Volume, V _R				679				
	Freeway Free-Flow Speed, S _{FF}				65.0				
	Ramp Free-Flow Speed, S _{FR}				45.0				
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5875	0.92	Level	8	0	0.962	1.00	6641	
Ramp	679	0.92	Level	3	0	0.985	1.00	749	
UpStream									
DownStream	885	0.92	Level	4	0	0.980	1.00	981	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 3318 pc/h V ₃ or V _{av34} 1661 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	6641	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	5892	Exhibit 13-8	9400	No
					V _R	749	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	3318	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 19.3 (pc/mi/ln) LOS = B (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11)					D _S = 0.365 (Exhibit 13-12)				
S _R = mph (Exhibit 13-11)					S _R = 56.6 mph (Exhibit 13-12)				
S ₀ = mph (Exhibit 13-11)					S ₀ = 68.7 mph (Exhibit 13-12)				
S = mph (Exhibit 13-13)					S = 62.1 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET								
General Information				Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Eastbound					
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman					
Date Performed	3/20/2017	Jurisdiction	Caltrans					
Analysis Time Period	PM Peak Hour	Analysis Year	EAC (2018)					
Project Description Gateway South Building 4 TIA (JN 10187)								
Inputs								
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp					
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On					
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	1500	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off					
L _{up} = 2950 ft	Deceleration Lane Length L _D		L _{down} = ft					
V _u = 679 veh/h	Freeway Volume, V _F	5875	V _D = veh/h					
	Ramp Volume, V _R	885						
	Freeway Free-Flow Speed, S _{FF}	65.0						
	Ramp Free-Flow Speed, S _{FR}	45.0						
Conversion to pc/h Under Base Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	5875	0.92	Level	8	0	0.962	1.00	6641
Ramp	885	0.92	Level	4	0	0.980	1.00	981
UpStream	679	0.92	Level	3	0	0.985	1.00	749
DownStream								
Merge Areas				Diverge Areas				
Estimation of v ₁₂				Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.095 using Equation (Exhibit 13-6) V ₁₂ = 632 pc/h V ₃ or V _{av34} = 3004 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2656 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}	7622	Exhibit 13-8	No	V _F		Exhibit 13-8		
				V _{FO} = V _F - V _R		Exhibit 13-8		
				V _R		Exhibit 13-10		
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}	3637	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)				Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 24.0 (pc/mi/ln) LOS = C (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination				Speed Determination				
M _S = 0.334 (Exhibit 13-11)				D _s = (Exhibit 13-12)				
S _R = 57.3 mph (Exhibit 13-11)				S _R = mph (Exhibit 13-12)				
S ₀ = 59.6 mph (Exhibit 13-11)				S ₀ = mph (Exhibit 13-12)				
S = 58.5 mph (Exhibit 13-13)				S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET								
General Information				Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Westbound					
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman					
Date Performed	3/20/2017	Jurisdiction	Caltrans					
Analysis Time Period	PM Peak Hour	Analysis Year	EAC (2018)					
Project Description Gateway South Building 4 TIA (JN 10187)								
Inputs								
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp					
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On					
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	1500	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off					
L _{up} = 1815 ft	Deceleration Lane Length L _D		L _{down} = ft					
V _u = 576 veh/h	Freeway Volume, V _F	6755	V _D = veh/h					
	Ramp Volume, V _R	1343						
	Freeway Free-Flow Speed, S _{FF}	65.0						
	Ramp Free-Flow Speed, S _{FR}	45.0						
Conversion to pc/h Under Base Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	6755	0.92	Level	20	0	0.909	1.00	8077
Ramp	1343	0.92	Level	1	0	0.995	1.00	1467
UpStream	576	0.92	Level	2	0	0.990	1.00	632
DownStream								
Merge Areas				Diverge Areas				
Estimation of v ₁₂				Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.034 using Equation (Exhibit 13-6) V ₁₂ = 278 pc/h V ₃ or V _{av34} = 3899 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 3230 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}	9544	Exhibit 13-8	Yes	V _F		Exhibit 13-8		
				V _{FO} = V _F - V _R		Exhibit 13-8		
				V _R		Exhibit 13-10		
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}	4697	Exhibit 13-8	4600:All	Yes	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)				Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 32.0 (pc/mi/ln) LOS = F (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination				Speed Determination				
M _S = 0.614 (Exhibit 13-11)				D _s = (Exhibit 13-12)				
S _R = 50.9 mph (Exhibit 13-11)				S _R = mph (Exhibit 13-12)				
S ₀ = 57.7 mph (Exhibit 13-11)				S ₀ = mph (Exhibit 13-12)				
S = 54.1 mph (Exhibit 13-13)				S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Westbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Waterman						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	EAC (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	4	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	Freeway Volume, V _F	6755	L _{down} =	1815 ft	Freeway Free-Flow Speed, S _{FF}	65.0
L _{up} =	Ramp Number of Lanes, N	1	V _D =	Ramp Volume, V _R	576			Ramp Free-Flow Speed, S _{FR}	45.0
V _u =	Acceleration Lane Length, L _A			Freeway Free-Flow Speed, S _{FF}	65.0				
	Deceleration Lane Length L _D	1500		Ramp Free-Flow Speed, S _{FR}	45.0				
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6755	0.92	Level	20	0	0.909	1.00	8077	
Ramp	576	0.92	Level	2	0	0.990	1.00	632	
UpStream									
DownStream	1343	0.92	Level	1	0	0.995	1.00	1467	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 3878 pc/h V ₃ or V _{av34} 2099 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	8077	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	7445	Exhibit 13-8	9400	No
					V _R	632	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	3878	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 24.1 (pc/mi/ln) LOS = C (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S =	(Exhibit 13-11)				D _S =	0.355 (Exhibit 13-12)			
S _R =	mph (Exhibit 13-11)				S _R =	56.8 mph (Exhibit 13-12)			
S ₀ =	mph (Exhibit 13-11)				S ₀ =	67.0 mph (Exhibit 13-12)			
S =	mph (Exhibit 13-13)				S =	61.7 mph (Exhibit 13-13)			

APPENDIX 7.14:

EAPC (2018) CONDITIONS RAMP JUNCTION ANALYSIS WORKSHEETS

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RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information				Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound	Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Auto Center	Date Performed	3/20/2017
Date Performed	3/20/2017	Jurisdiction	Caltrans	Analysis Time Period	AM Peak Hour	Analysis Year	EAPC (2018)	Project Description Gateway South Building 4 TIA (JN 10187)	
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp	Freeway Volume, V _F	5214	L _{down} = ft			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Volume, V _R	330	V _D = veh/h			
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	240	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Free-Flow Speed, S _{FF}	65.0				
L _{up} = 1840 ft	Deceleration Lane Length L _D			Ramp Free-Flow Speed, S _{FR}	45.0				
V _u = 974 veh/h									
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5214	0.92	Level	2	0	0.990	1.00	5724	
Ramp	330	0.92	Level	17	0	0.922	1.00	389	
UpStream	974	0.92	Level	2	0	0.990	1.00	1069	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.169 using Equation (Exhibit 13-6) V ₁₂ = 968 pc/h V ₃ or V _{av34} = 2378 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2289 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = V ₃ or V _{av34} = Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?		
V _{FO}	6113	Exhibit 13-8	No	V _F	Exhibit 13-8				
				V _{FO} = V _F - V _R	Exhibit 13-8				
				V _R	Exhibit 13-10				
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?		
V _{R12}	2678	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8			
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 24.7 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = 0.356 (Exhibit 13-11)					D _s = (Exhibit 13-12)				
S _R = 56.8 mph (Exhibit 13-11)					S _R = mph (Exhibit 13-12)				
S ₀ = 60.6 mph (Exhibit 13-11)					S ₀ = mph (Exhibit 13-12)				
S = 58.9 mph (Exhibit 13-13)					S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound							
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center							
Date Performed	3/20/2017	Jurisdiction	Caltrans							
Analysis Time Period	AM Peak Hour	Analysis Year	EAPC (2018)							
Project Description Gateway South Building 4 TIA (JN 10187)										
Inputs										
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N Ramp Number of Lanes, N Acceleration Lane Length, L _A Deceleration Lane Length L _D Freeway Volume, V _F Ramp Volume, V _R Freeway Free-Flow Speed, S _{FF} Ramp Free-Flow Speed, S _{FR}	4 2 975 6188 1231 65.0 45.0					Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off	L _{down} = 1260 ft V _D = 974 veh/h		
L _{up} = ft V _u = veh/h										
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	6188	0.92	Level	2	0	0.990	1.00	6793		
Ramp	1231	0.92	Level	5	0	0.976	1.00	1371		
UpStream										
DownStream	974	0.92	Level	2	0	0.990	1.00	1069		
Merge Areas					Diverge Areas					
Estimation of v ₁₂					Estimation of v ₁₂					
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 2781 pc/h V ₃ or V _{av34} 2006 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 13-8			V _F	6793	Exhibit 13-8	9400	No	
					V _{FO} = V _F - V _R	5422	Exhibit 13-8	9400	No	
					V _R	1371	Exhibit 13-10	4200	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?		
V _{R12}		Exhibit 13-8			V ₁₂	2781	Exhibit 13-8	4400:All	No	
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 9.1 (pc/mi/ln) LOS = A (Exhibit 13-2)					
Speed Determination					Speed Determination					
M _S = (Exhibit 13-11)					D _S = 0.421 (Exhibit 13-12)					
S _R = mph (Exhibit 13-11)					S _R = 55.3 mph (Exhibit 13-12)					
S ₀ = mph (Exhibit 13-11)					S ₀ = 67.4 mph (Exhibit 13-12)					
S = mph (Exhibit 13-13)					S = 61.9 mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	EAPC (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	5	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	Freeway Volume, V _F	5386	L _{down} =	1790 ft	Freeway Free-Flow Speed, S _{FF}	65.0
L _{up} =	Ramp Number of Lanes, N	1	V _D =	Ramp Volume, V _R	1547			Ramp Free-Flow Speed, S _{FR}	45.0
V _u =	Acceleration Lane Length, L _A			Freeway Free-Flow Speed, S _{FF}	65.0				
	Deceleration Lane Length L _D	180		Ramp Free-Flow Speed, S _{FR}	45.0				
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5386	0.92	Level	4	0	0.980	1.00	5971	
Ramp	1547	0.92	Level	3	0	0.985	1.00	1707	
UpStream									
DownStream	709	0.92	Level	6	0	0.971	1.00	794	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 3176 pc/h V ₃ or V _{av34} 950 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	5076	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	3369	Exhibit 13-8	9400	No
					V _R	1707	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	3176	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 29.9 (pc/mi/ln) LOS = D (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S =	(Exhibit 13-11)				D _S =	0.452 (Exhibit 13-12)			
S _R =	mph (Exhibit 13-11)				S _R =	54.6 mph (Exhibit 13-12)			
S ₀ =	mph (Exhibit 13-11)				S ₀ =	71.3 mph (Exhibit 13-12)			
S =	mph (Exhibit 13-13)				S =	59.9 mph (Exhibit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Upstream)						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	EAPC (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N = 4				Downstream Adj Ramp				
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N = 1				<input type="checkbox"/> Yes <input type="checkbox"/> On				
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A = 200				<input checked="" type="checkbox"/> No <input type="checkbox"/> Off				
L _{up} = 1070 ft	Deceleration Lane Length L _D				L _{down} = ft				
V _u = 709 veh/h	Freeway Volume, V _F = 6095				V _D = veh/h				
	Ramp Volume, V _R = 264								
	Freeway Free-Flow Speed, S _{FF} = 65.0								
	Ramp Free-Flow Speed, S _{FR} = 45.0								
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6095	0.92	Level	4	0	0.980	1.00	6757	
Ramp	264	0.92	Level	15	0	0.930	1.00	308	
UpStream	709	0.92	Level	6	0	0.971	1.00	794	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.179 using Equation (Exhibit 13-6) V ₁₂ = 1212 pc/h V ₃ or V _{av34} = 2772 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2702 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	7065	Exhibit 13-8		No	V _F		Exhibit 13-8		
					V _{FO} = V _F - V _R		Exhibit 13-8		
					V _R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	3010	Exhibit 13-8	4600:All	No	V ₁₂		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 27.6 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = 0.382 (Exhibit 13-11)					D _s = (Exhibit 13-12)				
S _R = 56.2 mph (Exhibit 13-11)					S _R = mph (Exhibit 13-12)				
S ₀ = 59.5 mph (Exhibit 13-11)					S ₀ = mph (Exhibit 13-12)				
S = 58.1 mph (Exhibit 13-13)					S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information				Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Downstream)						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	EAPC (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N Ramp Number of Lanes, N Acceleration Lane Length, L _A Deceleration Lane Length L _D	5 1 200	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	L _{up} = ft V _u = veh/h	Freeway Volume, V _F Ramp Volume, V _R Freeway Free-Flow Speed, S _{FF} Ramp Free-Flow Speed, S _{FR}	6744 264 65.0 45.0	L _{down} = 1115 ft V _D = 93 veh/h		
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6744	0.92	Level	4	0	0.980	1.00	7477	
Ramp	264	0.92	Level	15	0	0.930	1.00	308	
UpStream									
DownStream	93	0.92	Level	6	0	0.971	1.00	104	
Merge Areas				Diverge Areas					
Estimation of v ₁₂				Estimation of v ₁₂					
L _{EQ} =	V ₁₂ = V _F (P _{FM}) (Equation 13-6 or 13-7)				L _{EQ} =	V ₁₂ = V _R + (V _F - V _R)P _{FD} (Equation 13-12 or 13-13)			
P _{FM} =	0.179 using Equation (Exhibit 13-6)				P _{FD} =	using Equation (Exhibit 13-7)			
V ₁₂ =	979 pc/h				V ₁₂ =	pc/h			
V ₃ or V _{av34}	2240 pc/h (Equation 13-14 or 13-17)				V ₃ or V _{av34}	pc/h (Equation 13-14 or 13-17)			
Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No			
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input type="checkbox"/> Yes <input type="checkbox"/> No			
If Yes, V _{12a} =	2183 pc/h (Equation 13-16, 13-18, or 13-19)				If Yes, V _{12a} =	pc/h (Equation 13-16, 13-18, or 13-19)			
Capacity Checks				Capacity Checks					
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?		
V _{FO}	5767	Exhibit 13-8	No	V _F		Exhibit 13-8			
				V _{FO} = V _F - V _R		Exhibit 13-8			
				V _R		Exhibit 13-10			
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area					
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?		
V _{R12}	2491	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8			
Level of Service Determination (if not F)				Level of Service Determination (if not F)					
D _R =	5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A			D _R =	4.252 + 0.0086 V ₁₂ - 0.009 L _D				
D _R =	23.5 (pc/mi/ln)			D _R =	(pc/mi/ln)				
LOS =	C (Exhibit 13-2)			LOS =	(Exhibit 13-2)				
Speed Determination				Speed Determination					
M _S =	0.350 (Exhibit 13-11)			D _s =	(Exhibit 13-12)				
S _R =	56.9 mph (Exhibit 13-11)			S _R =	mph (Exhibit 13-12)				
S ₀ =	60.9 mph (Exhibit 13-11)			S ₀ =	mph (Exhibit 13-12)				
S =	59.1 mph (Exhibit 13-13)			S =	mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA		Freeway/Dir of Travel	I-10 Eastbound					
Agency or Company	Urban Crossroads, Inc.		Junction	Off-Ramp at Waterman					
Date Performed	3/20/2017		Jurisdiction	Caltrans					
Analysis Time Period	AM Peak Hour		Analysis Year	EAPC (2018)					
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N		4		Downstream Adj Ramp				
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N		1		<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On				
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A				<input type="checkbox"/> No <input type="checkbox"/> Off				
L _{up} = ft	Deceleration Lane Length L _D		1500		L _{down} = 2950 ft				
V _u = veh/h	Freeway Volume, V _F		6310		V _D = 436 veh/h				
	Ramp Volume, V _R		1180						
	Freeway Free-Flow Speed, S _{FF}		65.0						
	Ramp Free-Flow Speed, S _{FR}		45.0						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6310	0.92	Level	11	0	0.948	1.00	7236	
Ramp	1180	0.92	Level	3	0	0.985	1.00	1302	
UpStream									
DownStream	436	0.92	Level	7	0	0.966	1.00	490	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 3889 pc/h V ₃ or V _{av34} 1673 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	7236	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	5934	Exhibit 13-8	9400	No
					V _R	1302	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	3889	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 24.2 (pc/mi/ln) LOS = C (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S =	(Exhibit 13-11)				D _S =	0.415 (Exhibit 13-12)			
S _R =	mph (Exhibit 13-11)				S _R =	55.5 mph (Exhibit 13-12)			
S ₀ =	mph (Exhibit 13-11)				S ₀ =	68.7 mph (Exhibit 13-12)			
S =	mph (Exhibit 13-13)				S =	60.9 mph (Exhibit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information				Site Information					
Analyst	BA	Freeway/Dir of Travel	I-10 Eastbound	Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman	Date Performed	3/20/2017
Date Performed	3/20/2017	Jurisdiction	Caltrans	Analysis Time Period	AM Peak Hour	Analysis Year	EAPC (2018)	Project Description	Gateway South Building 4 TIA (JN 10187)
Inputs									
Upstream Adj Ramp	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Freeway Number of Lanes, N	4	Downstream Adj Ramp	<input type="checkbox"/> Yes <input type="checkbox"/> On	Freeway Volume, V _F	6310	L _{down} =	ft
	<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Ramp Number of Lanes, N	1		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Ramp Volume, V _R	436	V _D =	veh/h
L _{up} =	2950 ft	Acceleration Lane Length, L _A	1500			Freeway Free-Flow Speed, S _{FF}	65.0		
V _u =	1180 veh/h	Deceleration Lane Length L _D				Ramp Free-Flow Speed, S _{FR}	45.0		
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6310	0.92	Level	11	0	0.948	1.00	7236	
Ramp	436	0.92	Level	7	0	0.966	1.00	490	
UpStream	1180	0.92	Level	3	0	0.985	1.00	1302	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.157 using Equation (Exhibit 13-6) V ₁₂ = 1133 pc/h V ₃ or V _{av34} = 3051 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2894 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = V ₃ or V _{av34} = Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?		
V _{FO}	7726	Exhibit 13-8	No		V _F	Exhibit 13-8			
					V _{FO} = V _F - V _R	Exhibit 13-8			
					V _R	Exhibit 13-10			
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?		
V _{R12}	3384	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8			
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 22.2 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S =	0.301 (Exhibit 13-11)				D _s =	(Exhibit 13-12)			
S _R =	58.1 mph (Exhibit 13-11)				S _R =	mph (Exhibit 13-12)			
S ₀ =	59.0 mph (Exhibit 13-11)				S ₀ =	mph (Exhibit 13-12)			
S =	58.6 mph (Exhibit 13-13)				S =	mph (Exhibit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET								
General Information				Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Westbound					
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman					
Date Performed	4/3/2017	Jurisdiction	Caltrans					
Analysis Time Period	AM Peak Hour	Analysis Year	EAPC (2018)					
Project Description Gateway South Building 4 TIA (JN 10187)								
Inputs								
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp					
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On					
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	1500	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off					
L _{up} = 1815 ft	Deceleration Lane Length L _D		L _{down} = ft					
V _u = 1091 veh/h	Freeway Volume, V _F	7787	V _D = veh/h					
	Ramp Volume, V _R	326						
	Freeway Free-Flow Speed, S _{FF}	65.0						
	Ramp Free-Flow Speed, S _{FR}	45.0						
Conversion to pc/h Under Base Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	7787	0.92	Level	15	0	0.930	1.00	9099
Ramp	326	0.92	Level	7	0	0.966	1.00	367
UpStream	1091	0.92	Level	3	0	0.985	1.00	1204
DownStream								
Merge Areas				Diverge Areas				
Estimation of v ₁₂				Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.172 using Equation (Exhibit 13-6) V ₁₂ = 1564 pc/h V ₃ or V _{av34} = 3767 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 3699 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}	9466	Exhibit 13-8	Yes	V _F		Exhibit 13-8		
				V _{FO} = V _F - V _R		Exhibit 13-8		
				V _R		Exhibit 13-10		
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}	4066	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)				Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 27.6 (pc/mi/ln) LOS = F (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination				Speed Determination				
M _S = 0.413 (Exhibit 13-11)				D _s = (Exhibit 13-12)				
S _R = 55.5 mph (Exhibit 13-11)				S _R = mph (Exhibit 13-12)				
S ₀ = 56.1 mph (Exhibit 13-11)				S ₀ = mph (Exhibit 13-12)				
S = 55.8 mph (Exhibit 13-13)				S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Westbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Waterman						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	EAPC (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	4	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	Freeway Volume, V _F	7787	L _{down} =	1815 ft	Freeway Free-Flow Speed, S _{FF}	65.0
L _{up} =	Ramp Number of Lanes, N	1	V _D =	Ramp Volume, V _R	1091			Ramp Free-Flow Speed, S _{FR}	45.0
V _u =	Acceleration Lane Length, L _A			Deceleration Lane Length L _D	1500				
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	7787	0.92	Level	15	0	0.930	1.00	9099	
Ramp	1091	0.92	Level	3	0	0.985	1.00	1204	
UpStream									
DownStream	320	0.92	Level	7	0	0.966	1.00	360	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 4646 pc/h V ₃ or V _{av34} 2226 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	9099	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	7895	Exhibit 13-8	9400	No
					V _R	1204	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	4646	Exhibit 13-8	4400:All	Yes
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 30.7 (pc/mi/ln) LOS = D (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S =	(Exhibit 13-11)				D _S =	0.406 (Exhibit 13-12)			
S _R =	mph (Exhibit 13-11)				S _R =	55.7 mph (Exhibit 13-12)			
S ₀ =	mph (Exhibit 13-11)				S ₀ =	66.5 mph (Exhibit 13-12)			
S =	mph (Exhibit 13-13)				S =	60.5 mph (Exhibit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET								
General Information				Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound					
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Auto Center					
Date Performed	3/20/2017	Jurisdiction	Caltrans					
Analysis Time Period	PM Peak Hour	Analysis Year	EAPC (2018)					
Project Description Gateway South Building 4 TIA (JN 10187)								
Inputs								
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp					
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On					
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	240	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off					
L _{up} = 1840 ft	Deceleration Lane Length L _D		L _{down} = ft					
V _u = 925 veh/h	Freeway Volume, V _F	5856	V _D = veh/h					
	Ramp Volume, V _R	953						
	Freeway Free-Flow Speed, S _{FF}	65.0						
	Ramp Free-Flow Speed, S _{FR}	45.0						
Conversion to pc/h Under Base Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	5856	0.92	Level	1	0	0.995	1.00	6397
Ramp	953	0.92	Level	3	0	0.985	1.00	1051
UpStream	925	0.92	Level	2	0	0.990	1.00	1015
DownStream								
Merge Areas				Diverge Areas				
Estimation of v ₁₂				Estimation of v ₁₂				
L _{EQ} =	V ₁₂ = V _F (P _{FM}) (Equation 13-6 or 13-7)			L _{EQ} =	V ₁₂ = V _R + (V _F - V _R)P _{FD} (Equation 13-12 or 13-13)			
P _{FM} =	0.086 using Equation (Exhibit 13-6)			P _{FD} =	using Equation (Exhibit 13-7)			
V ₁₂ =	553 pc/h			V ₁₂ =	pc/h			
V ₃ or V _{av34}	2922 pc/h (Equation 13-14 or 13-17)			V ₃ or V _{av34}	pc/h (Equation 13-14 or 13-17)			
Is V ₃ or V _{av34} > 2,700 pc/h?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No			
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input type="checkbox"/> Yes <input type="checkbox"/> No			
If Yes, V _{12a} =	2558 pc/h (Equation 13-16, 13-18, or 13-19)			If Yes, V _{12a} =	pc/h (Equation 13-16, 13-18, or 13-19)			
Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}	7448	Exhibit 13-8	No	V _F		Exhibit 13-8		
				V _{FO} = V _F - V _R		Exhibit 13-8		
				V _R		Exhibit 13-10		
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}	3609	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)				Level of Service Determination (if not F)				
D _R =	5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A			D _R =	4.252 + 0.0086 V ₁₂ - 0.009 L _D			
D _R =	31.6 (pc/mi/ln)			D _R =	(pc/mi/ln)			
LOS =	D (Exhibit 13-2)			LOS =	(Exhibit 13-2)			
Speed Determination				Speed Determination				
M _S =	0.443 (Exhibit 13-11)			D _s =	(Exhibit 13-12)			
S _R =	54.8 mph (Exhibit 13-11)			S _R =	mph (Exhibit 13-12)			
S ₀ =	59.9 mph (Exhibit 13-11)			S ₀ =	mph (Exhibit 13-12)			
S =	57.3 mph (Exhibit 13-13)			S =	mph (Exhibit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound							
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center							
Date Performed	3/20/2017	Jurisdiction	Caltrans							
Analysis Time Period	PM Peak Hour	Analysis Year	EAPC (2018)							
Project Description Gateway South Building 4 TIA (JN 10187)										
Inputs										
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	4	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Freeway Volume, V _F	6780	L _{down} =	1260 ft	Freeway Free-Flow Speed, S _{FF}	65.0	
L _{up} =	Ramp Number of Lanes, N	2	V _D =	Ramp Volume, V _R	1135			Ramp Free-Flow Speed, S _{FR}	45.0	
V _u =	Acceleration Lane Length, L _A			Freeway Free-Flow Speed, S _{FF}	65.0					
	Deceleration Lane Length L _D	975		Ramp Free-Flow Speed, S _{FR}	45.0					
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	6780	0.92	Level	1	0	0.995	1.00	7406		
Ramp	1135	0.92	Level	5	0	0.976	1.00	1265		
UpStream										
DownStream	925	0.92	Level	2	0	0.990	1.00	1015		
Merge Areas					Diverge Areas					
Estimation of v ₁₂					Estimation of v ₁₂					
L _{EQ} =	V ₁₂ = V _F (P _{FM}) (Equation 13-6 or 13-7)				L _{EQ} =	V ₁₂ = V _R + (V _F - V _R)P _{FD} (Equation 13-12 or 13-13)				
P _{FM} =	using Equation (Exhibit 13-6)				P _{FD} =	0.260 using Equation (Exhibit 13-7)				
V ₁₂ =	pc/h				V ₁₂ =	2862 pc/h				
V ₃ or V _{av34}	pc/h (Equation 13-14 or 13-17)				V ₃ or V _{av34}	2272 pc/h (Equation 13-14 or 13-17)				
Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, V _{12a} =	pc/h (Equation 13-16, 13-18, or 13-19)				If Yes, V _{12a} =	2962 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 13-8			V _F	7406	Exhibit 13-8		9400	No
					V _{FO} = V _F - V _R	6141	Exhibit 13-8		9400	No
					V _R	1265	Exhibit 13-10		4200	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	2862	Exhibit 13-8		4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
D _R =	5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A				D _R =	4.252 + 0.0086 V ₁₂ - 0.009 L _D				
D _R =	(pc/mi/ln)				D _R =	10.6 (pc/mi/ln)				
LOS =	(Exhibit 13-2)				LOS =	B (Exhibit 13-2)				
Speed Determination					Speed Determination					
M _S =	(Exhibit 13-11)				D _S =	0.412 (Exhibit 13-12)				
S _R =	mph (Exhibit 13-11)				S _R =	55.5 mph (Exhibit 13-12)				
S ₀ =	mph (Exhibit 13-11)				S ₀ =	66.5 mph (Exhibit 13-12)				
S =	mph (Exhibit 13-13)				S =	61.6 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET											
General Information					Site Information						
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound								
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center								
Date Performed	3/20/2017	Jurisdiction	Caltrans								
Analysis Time Period	PM Peak Hour	Analysis Year	EAPC (2018)								
Project Description Gateway South Building 4 TIA (JN 10187)											
Inputs											
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	5	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	Freeway Volume, V _F	4751	L _{down} =	1790 ft	Freeway Free-Flow Speed, S _{FF}	65.0	V _D =	1079 veh/h
L _{up} =	Ramp Number of Lanes, N	1	L _{down} =	Ramp Volume, V _R	933	V _D =	1079 veh/h	Ramp Free-Flow Speed, S _{FR}	45.0		
V _u =	Acceleration Lane Length, L _A			Freeway Free-Flow Speed, S _{FF}	65.0			Ramp Free-Flow Speed, S _{FR}	45.0		
	Deceleration Lane Length L _D	180									
Conversion to pc/h Under Base Conditions											
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p			
Freeway	4751	0.92	Level	1	0	0.995	1.00	5190			
Ramp	933	0.92	Level	6	0	0.971	1.00	1045			
UpStream											
DownStream	1079	0.92	Level	3	0	0.985	1.00	1190			
Merge Areas					Diverge Areas						
Estimation of v ₁₂					Estimation of v ₁₂						
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 2626 pc/h V ₃ or V _{av34} 1022 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)						
Capacity Checks					Capacity Checks						
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?		
V _{FO}		Exhibit 13-8			V _F	4671	Exhibit 13-8	9400	No		
					V _{FO} = V _F - V _R	3626	Exhibit 13-8	9400	No		
					V _R	1045	Exhibit 13-10	2100	No		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area						
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?			
V _{R12}		Exhibit 13-8			V ₁₂	2626	Exhibit 13-8	4400:All	No		
Level of Service Determination (if not F)					Level of Service Determination (if not F)						
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 25.2 (pc/mi/ln) LOS = C (Exhibit 13-2)						
Speed Determination					Speed Determination						
M _S =	(Exhibit 13-11)				D _S =	0.392 (Exhibit 13-12)					
S _R =	mph (Exhibit 13-11)				S _R =	56.0 mph (Exhibit 13-12)					
S ₀ =	mph (Exhibit 13-11)				S ₀ =	71.2 mph (Exhibit 13-12)					
S =	mph (Exhibit 13-13)				S =	61.8 mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information				Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Upstream)						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	EAPC (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N		4		Downstream Adj Ramp				
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N		1		<input type="checkbox"/> Yes <input type="checkbox"/> On				
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A		200		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off				
L _{up} = 1070 ft	Deceleration Lane Length L _D				L _{down} = ft				
V _u = 1079 veh/h	Freeway Volume, V _F		5831		V _D = veh/h				
	Ramp Volume, V _R		733						
	Freeway Free-Flow Speed, S _{FF}		65.0						
	Ramp Free-Flow Speed, S _{FR}		45.0						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5831	0.92	Level	2	0	0.990	1.00	6401	
Ramp	733	0.92	Level	6	0	0.971	1.00	821	
UpStream	1079	0.92	Level	3	0	0.985	1.00	1190	
DownStream									
Merge Areas				Diverge Areas					
Estimation of v ₁₂				Estimation of v ₁₂					
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.115 using Equation (Exhibit 13-6) V ₁₂ = 737 pc/h V ₃ or V _{av34} = 2832 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2560 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks				Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	7222	Exhibit 13-8		No	V _F	Exhibit 13-8			
					V _{FO} = V _F - V _R	Exhibit 13-8			
					V _R	Exhibit 13-10			
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	3381	Exhibit 13-8		No	V ₁₂	Exhibit 13-8			
Level of Service Determination (if not F)				Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 30.2 (pc/mi/ln) LOS = D (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					
Speed Determination				Speed Determination					
M _S = 0.418 (Exhibit 13-11) S _R = 55.4 mph (Exhibit 13-11) S ₀ = 59.9 mph (Exhibit 13-11) S = 57.7 mph (Exhibit 13-13)				D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information				Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Downstream)						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	EAPC (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N	5				Downstream Adj Ramp			
	Ramp Number of Lanes, N	1				<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On			
	Acceleration Lane Length, L _A	200				<input type="checkbox"/> No <input type="checkbox"/> Off			
	Deceleration Lane Length L _D					L _{down} = 1115 ft			
	Freeway Volume, V _F	8277				V _D = 270 veh/h			
	Ramp Volume, V _R	733							
	Freeway Free-Flow Speed, S _{FF}	65.0							
Ramp Free-Flow Speed, S _{FR}	45.0								
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	8277	0.92	Level	3	0	0.985	1.00	9132	
Ramp	733	0.92	Level	6	0	0.971	1.00	821	
UpStream									
DownStream	270	0.92	Level	5	0	0.976	1.00	301	
Merge Areas				Diverge Areas					
Estimation of v ₁₂				Estimation of v ₁₂					
V ₁₂ = V _F (P _{FM}) (Equation 13-6 or 13-7)				V ₁₂ = V _R + (V _F - V _R)P _{FD} (Equation 13-12 or 13-13)					
L _{EQ} =	0.115 using Equation (Exhibit 13-6)			L _{EQ} =	using Equation (Exhibit 13-7)				
P _{FM} =	764 pc/h			P _{FD} =	pc/h				
V ₁₂ =	2934 pc/h (Equation 13-14 or 13-17)			V ₁₂ =	pc/h (Equation 13-14 or 13-17)				
V ₃ or V _{av34}	2934 pc/h (Equation 13-14 or 13-17)			V ₃ or V _{av34}	pc/h (Equation 13-14 or 13-17)				
Is V ₃ or V _{av34} > 2,700 pc/h?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No				
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, V _{12a} =	2652 pc/h (Equation 13-16, 13-18, or 13-19)			If Yes, V _{12a} =	pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks				Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	7453	Exhibit 13-8		No	V _F		Exhibit 13-8		
					V _{FO} = V _F - V _R		Exhibit 13-8		
					V _R		Exhibit 13-10		
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	3473	Exhibit 13-8	4600:All	No	V ₁₂		Exhibit 13-8		
Level of Service Determination (if not F)				Level of Service Determination (if not F)					
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A				D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D					
D _R =	30.9 (pc/mi/ln)			D _R =	(pc/mi/ln)				
LOS =	D (Exhibit 13-2)			LOS =	(Exhibit 13-2)				
Speed Determination				Speed Determination					
M _S =	0.429 (Exhibit 13-11)			D _s =	(Exhibit 13-12)				
S _R =	55.1 mph (Exhibit 13-11)			S _R =	mph (Exhibit 13-12)				
S ₀ =	59.6 mph (Exhibit 13-11)			S ₀ =	mph (Exhibit 13-12)				
S =	57.5 mph (Exhibit 13-13)			S =	mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst	BA	Freeway/Dir of Travel	I-10 Eastbound							
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Waterman							
Date Performed	3/20/2017	Jurisdiction	Caltrans							
Analysis Time Period	PM Peak Hour	Analysis Year	EAPC (2018)							
Project Description Gateway South Building 4 TIA (JN 10187)										
Inputs										
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N Ramp Number of Lanes, N Acceleration Lane Length, L _A Deceleration Lane Length L _D Freeway Volume, V _F Ramp Volume, V _R Freeway Free-Flow Speed, S _{FF} Ramp Free-Flow Speed, S _{FR}	4 1 1500 5875 694 65.0 45.0					Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 2950 ft V _D = 914 veh/h			
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	5875	0.92	Level	8	0	0.962	1.00	6641		
Ramp	694	0.92	Level	4	0	0.980	1.00	769		
UpStream										
DownStream	914	0.92	Level	4	0	0.980	1.00	1013		
Merge Areas					Diverge Areas					
Estimation of v ₁₂					Estimation of v ₁₂					
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 3329 pc/h V ₃ or V _{av34} 1656 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 13-8			V _F	6641	Exhibit 13-8	9400	No	
					V _{FO} = V _F - V _R	5872	Exhibit 13-8	9400	No	
					V _R	769	Exhibit 13-10	2100	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?		
V _{R12}		Exhibit 13-8			V ₁₂	3329	Exhibit 13-8	4400:All	No	
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 19.4 (pc/mi/ln) LOS = B (Exhibit 13-2)					
Speed Determination					Speed Determination					
M _S = (Exhibit 13-11)					D _S = 0.367 (Exhibit 13-12)					
S _R = mph (Exhibit 13-11)					S _R = 56.6 mph (Exhibit 13-12)					
S ₀ = mph (Exhibit 13-11)					S ₀ = 68.7 mph (Exhibit 13-12)					
S = mph (Exhibit 13-13)					S = 62.0 mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET								
General Information				Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Eastbound					
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman					
Date Performed	3/20/2017	Jurisdiction	Caltrans					
Analysis Time Period	PM Peak Hour	Analysis Year	EAPC (2018)					
Project Description Gateway South Building 4 TIA (JN 10187)								
Inputs								
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp					
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On					
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	1500	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off					
L _{up} = 2950 ft	Deceleration Lane Length L _D		L _{down} = ft					
V _u = 694 veh/h	Freeway Volume, V _F	5875	V _D = veh/h					
	Ramp Volume, V _R	914						
	Freeway Free-Flow Speed, S _{FF}	65.0						
	Ramp Free-Flow Speed, S _{FR}	45.0						
Conversion to pc/h Under Base Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	5875	0.92	Level	8	0	0.962	1.00	6641
Ramp	914	0.92	Level	4	0	0.980	1.00	1013
UpStream	694	0.92	Level	4	0	0.980	1.00	769
DownStream								
Merge Areas				Diverge Areas				
Estimation of v ₁₂				Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.091 using Equation (Exhibit 13-6) V ₁₂ = 605 pc/h V ₃ or V _{av34} = 3018 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2656 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}	7654	Exhibit 13-8	No	V _F		Exhibit 13-8		
				V _{FO} = V _F - V _R		Exhibit 13-8		
				V _R		Exhibit 13-10		
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}	3669	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)				Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 24.2 (pc/mi/ln) LOS = C (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination				Speed Determination				
M _S = 0.339 (Exhibit 13-11)				D _s = (Exhibit 13-12)				
S _R = 57.2 mph (Exhibit 13-11)				S _R = mph (Exhibit 13-12)				
S ₀ = 59.6 mph (Exhibit 13-11)				S ₀ = mph (Exhibit 13-12)				
S = 58.4 mph (Exhibit 13-13)				S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Westbound						
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman						
Date Performed	4/3/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	EAPC (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N = 4				Downstream Adj Ramp				
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N = 1				<input type="checkbox"/> Yes <input type="checkbox"/> On				
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A = 1500				<input checked="" type="checkbox"/> No <input type="checkbox"/> Off				
L _{up} = 1815 ft	Deceleration Lane Length L _D				L _{down} = ft				
V _u = 589 veh/h	Freeway Volume, V _F = 6755				V _D = veh/h				
	Ramp Volume, V _R = 1360								
	Freeway Free-Flow Speed, S _{FF} = 65.0								
	Ramp Free-Flow Speed, S _{FR} = 45.0								
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6755	0.92	Level	20	0	0.909	1.00	8077	
Ramp	1360	0.92	Level	1	0	0.995	1.00	1486	
UpStream	589	0.92	Level	3	0	0.985	1.00	650	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.032 using Equation (Exhibit 13-6) V ₁₂ = 259 pc/h V ₃ or V _{av34} = 3909 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 3230 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	9563	Exhibit 13-8		Yes	V _F		Exhibit 13-8		
					V _{FO} = V _F - V _R		Exhibit 13-8		
					V _R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	4716	Exhibit 13-8	4600:All	Yes	V ₁₂		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 32.2 (pc/mi/ln) LOS = F (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = 0.622 (Exhibit 13-11)					D _s = (Exhibit 13-12)				
S _R = 50.7 mph (Exhibit 13-11)					S _R = mph (Exhibit 13-12)				
S ₀ = 57.7 mph (Exhibit 13-11)					S ₀ = mph (Exhibit 13-12)				
S = 54.0 mph (Exhibit 13-13)					S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Westbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Waterman						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	EAPC (2018)						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	4	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	Freeway Volume, V _F	6755	L _{down} =	1815 ft	Freeway Free-Flow Speed, S _{FF}	65.0
L _{up} =	Ramp Number of Lanes, N	1	V _D =	Ramp Volume, V _R	589			Ramp Free-Flow Speed, S _{FR}	45.0
V _u =	Acceleration Lane Length, L _A			Freeway Free-Flow Speed, S _{FF}	65.0				
	Deceleration Lane Length L _D	1500		Ramp Free-Flow Speed, S _{FR}	45.0				
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6755	0.92	Level	20	0	0.909	1.00	8077	
Ramp	589	0.92	Level	3	0	0.985	1.00	650	
UpStream									
DownStream	1343	0.92	Level	1	0	0.995	1.00	1467	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 3888 pc/h V ₃ or V _{av34} 2094 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	8077	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	7427	Exhibit 13-8	9400	No
					V _R	650	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	3888	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 24.2 (pc/mi/ln) LOS = C (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S =	(Exhibit 13-11)				D _S =	0.356 (Exhibit 13-12)			
S _R =	mph (Exhibit 13-11)				S _R =	56.8 mph (Exhibit 13-12)			
S ₀ =	mph (Exhibit 13-11)				S ₀ =	67.0 mph (Exhibit 13-12)			
S =	mph (Exhibit 13-13)				S =	61.7 mph (Exhibit 13-13)			

APPENDIX 8.1:

**HORIZON YEAR (2040) WITHOUT PROJECT CONDITIONS INTERSECTION OPERATIONS
ANALYSIS WORKSHEETS**

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Timings
1: I-215 SB Ramps & Auto Center Rd.

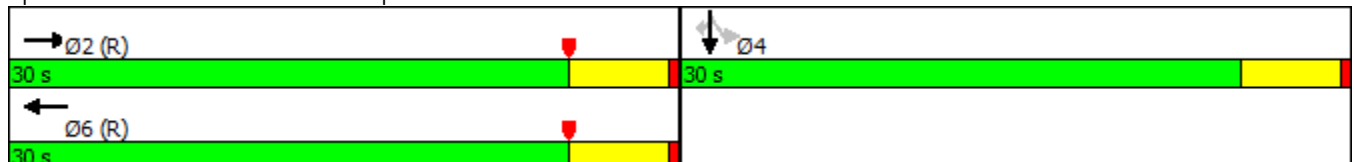


Lane Group	EBT	WBT	SBL	SBT	SBR
Lane Configurations	↑↑	↑↑	↗	↖	↗
Traffic Volume (vph)	373	577	1386	40	286
Future Volume (vph)	373	577	1386	40	286
Turn Type	NA	NA	Perm	NA	Perm
Protected Phases	2	6		4	
Permitted Phases			4		4
Detector Phase	2	6	4	4	4
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	30.0	22.5	22.5	22.5	22.5
Total Split (s)	30.0	30.0	30.0	30.0	30.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	Max	Max	Max
Act Effct Green (s)	25.0	25.0	25.0	25.0	25.0
Actuated g/C Ratio	0.42	0.42	0.42	0.42	0.42
v/c Ratio	0.34	0.41	1.06	1.02	0.36
Control Delay	10.4	12.4	72.9	59.2	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.4	12.4	72.9	59.2	7.2
LOS	B	B	E	E	A
Approach Delay	10.4	12.4		56.2	
Approach LOS	B	B		E	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 2 (3%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.06
 Intersection Signal Delay: 39.0
 Intersection LOS: D
 Intersection Capacity Utilization 68.1%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 1: I-215 SB Ramps & Auto Center Rd.



HCM Signalized Intersection Capacity Analysis
1: I-215 SB Ramps & Auto Center Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑					↘	↙	↗
Traffic Volume (vph)	0	373	122	0	577	0	0	0	0	1386	40	286
Future Volume (vph)	0	373	122	0	577	0	0	0	0	1386	40	286
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		5.0			5.0					5.0	5.0	5.0
Lane Util. Factor		0.95			0.95					0.95	0.95	1.00
Frt		0.96			1.00					1.00	1.00	0.85
Flt Protected		1.00			1.00					0.95	0.95	1.00
Satd. Flow (prot)		3600			3600					1700	1800	1800
Flt Permitted		1.00			1.00					0.95	0.95	1.00
Satd. Flow (perm)		3600			3600					1700	1800	1800
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	397	130	0	614	0	0	0	0	1474	43	304
RTOR Reduction (vph)	0	53	0	0	0	0	0	0	0	0	0	92
Lane Group Flow (vph)	0	474	0	0	614	0	0	0	0	752	765	212
Turn Type		NA			NA					Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases										4		4
Actuated Green, G (s)		25.0			25.0					25.0	25.0	25.0
Effective Green, g (s)		25.0			25.0					25.0	25.0	25.0
Actuated g/C Ratio		0.42			0.42					0.42	0.42	0.42
Clearance Time (s)		5.0			5.0					5.0	5.0	5.0
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1500			1500					708	750	750
v/s Ratio Prot		0.13			c0.17							
v/s Ratio Perm										c0.44	0.42	0.12
v/c Ratio		0.32			0.41					1.06	1.02	0.28
Uniform Delay, d1		11.8			12.3					17.5	17.5	11.6
Progression Factor		1.00			0.94					1.00	1.00	1.00
Incremental Delay, d2		0.6			0.7					51.5	38.0	0.9
Delay (s)		12.3			12.3					69.0	55.5	12.5
Level of Service		B			B					E	E	B
Approach Delay (s)		12.3			12.3			0.0			53.9	
Approach LOS		B			B			A			D	

Intersection Summary


















HCM 2000 Control Delay	37.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
1: I-215 SB Ramps & Auto Center Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	373	122	0	577	0	0	0	0	1386	40	286
Future Volume (veh/h)	0	373	122	0	577	0	0	0	0	1386	40	286
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	0	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	397	123	0	614	0				1505	0	199
Adj No. of Lanes	0	2	0	0	2	0				2	0	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1075	329	0	1425	0				1349	0	637
Arrive On Green	0.00	0.42	0.42	0.00	0.83	0.00				0.42	0.00	0.42
Sat Flow, veh/h	0	2670	790	0	3600	0				3238	0	1530
Grp Volume(v), veh/h	0	262	258	0	614	0				1505	0	199
Grp Sat Flow(s),veh/h/ln	0	1710	1661	0	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	6.3	6.4	0.0	2.8	0.0				25.0	0.0	5.2
Cycle Q Clear(g_c), s	0.0	6.3	6.4	0.0	2.8	0.0				25.0	0.0	5.2
Prop In Lane	0.00		0.48	0.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	713	692	0	1425	0				1349	0	637
V/C Ratio(X)	0.00	0.37	0.37	0.00	0.43	0.00				1.12	0.00	0.31
Avail Cap(c_a), veh/h	0	713	692	0	1425	0				1349	0	637
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	12.1	12.1	0.0	3.2	0.0				17.5	0.0	11.7
Incr Delay (d2), s/veh	0.0	1.5	1.5	0.0	1.0	0.0				62.7	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.3	3.2	0.0	1.4	0.0				22.8	0.0	2.4
LnGrp Delay(d),s/veh	0.0	13.5	13.6	0.0	4.1	0.0				80.2	0.0	13.0
LnGrp LOS		B	B		A					F		B
Approach Vol, veh/h		520			614						1704	
Approach Delay, s/veh		13.6			4.1						72.3	
Approach LOS		B			A						E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		30.0		30.0		30.0						
Change Period (Y+Rc), s		5.0		5.0		5.0						
Max Green Setting (Gmax), s		25.0		25.0		25.0						
Max Q Clear Time (g_c+I1), s		8.4		27.0		4.8						
Green Ext Time (p_c), s		6.4		0.0		7.0						
Intersection Summary												
HCM 2010 Ctrl Delay			46.8									
HCM 2010 LOS			D									
Notes												

Timings

2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations	↶	↷	↶	↷	↶	↷	↷
Traffic Volume (vph)	181	1578	567	421	436	13	1048
Future Volume (vph)	181	1578	567	421	436	13	1048
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm
Protected Phases	5	2	6		8	8	
Permitted Phases				6			8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	8.0	8.0	8.0	5.0	5.0	5.0
Minimum Split (s)	8.5	39.0	13.0	13.0	10.0	10.0	10.0
Total Split (s)	9.8	39.0	29.2	29.2	21.0	21.0	21.0
Total Split (%)	16.3%	65.0%	48.7%	48.7%	35.0%	35.0%	35.0%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max
Act Effect Green (s)	6.3	34.0	24.2	24.2	16.0	16.0	16.0
Actuated g/C Ratio	0.10	0.57	0.40	0.40	0.27	0.27	0.27
v/c Ratio	1.12	0.85	0.43	0.46	0.54	0.52	1.12
Control Delay	112.4	12.4	19.5	10.7	24.1	23.3	87.9
Queue Delay	0.0	18.5	0.0	0.0	0.0	0.0	0.6
Total Delay	112.4	30.9	19.5	10.7	24.1	23.3	88.5
LOS	F	C	B	B	C	C	F
Approach Delay		39.3	15.7			69.1	
Approach LOS		D	B			E	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 1 (2%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.12
 Intersection Signal Delay: 44.3
 Intersection LOS: D
 Intersection Capacity Utilization 93.1%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.



























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↗	↗↗			
Traffic Volume (vph)	181	1578	0	0	567	421	436	13	1048	0	0	0
Future Volume (vph)	181	1578	0	0	567	421	436	13	1048	0	0	0
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800	1700	1800	1800	1800	1800	1800
Total Lost time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	0.88			
Frbp, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	1700	3600			3600	1800	1700	1800	3600			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	1700	3600			3600	1800	1700	1800	3600			
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	199	1734	0	0	623	463	479	14	1152	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	276	0	0	73	0	0	0
Lane Group Flow (vph)	199	1734	0	0	623	187	244	249	1079	0	0	0
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	6.3	34.0			24.2	24.2	16.0	16.0	16.0			
Effective Green, g (s)	6.3	34.0			24.2	24.2	16.0	16.0	16.0			
Actuated g/C Ratio	0.10	0.57			0.40	0.40	0.27	0.27	0.27			
Clearance Time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Vehicle Extension (s)	2.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	178	2040			1452	726	453	480	960			
v/s Ratio Prot	c0.12	c0.48			0.17		0.14	0.14				
v/s Ratio Perm						0.10			c0.30			
v/c Ratio	1.12	0.85			0.43	0.26	0.54	0.52	1.12			
Uniform Delay, d1	26.9	10.9			12.9	11.9	18.8	18.7	22.0			
Progression Factor	0.91	0.85			1.44	8.65	1.00	1.00	1.00			
Incremental Delay, d2	82.4	2.3			0.8	0.7	4.5	4.0	69.3			
Delay (s)	106.9	11.5			19.3	103.8	23.4	22.7	91.3			
Level of Service	F	B			B	F	C	C	F			
Approach Delay (s)		21.4			55.4			70.8			0.0	
Approach LOS		C			E			E			A	

Intersection Summary			
HCM 2000 Control Delay	46.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	93.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 				 			
Traffic Volume (veh/h)	181	1578	0	0	567	421	436	13	1048	0	0	0
Future Volume (veh/h)	181	1578	0	0	567	421	436	13	1048	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1700	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	199	1734	0	0	623	381	489	0	993			
Adj No. of Lanes	1	2	0	0	2	1	2	0	2			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	170	1938	0	0	1379	617	863	0	816			
Arrive On Green	0.11	0.57	0.00	0.00	0.54	0.54	0.27	0.00	0.27			
Sat Flow, veh/h	1619	3510	0	0	3510	1530	3238	0	3060			
Grp Volume(v), veh/h	199	1734	0	0	623	381	489	0	993			
Grp Sat Flow(s),veh/h/ln	1619	1710	0	0	1710	1530	1619	0	1530			
Q Serve(g_s), s	6.3	26.7	0.0	0.0	6.7	10.4	7.8	0.0	16.0			
Cycle Q Clear(g_c), s	6.3	26.7	0.0	0.0	6.7	10.4	7.8	0.0	16.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	170	1938	0	0	1379	617	863	0	816			
V/C Ratio(X)	1.17	0.89	0.00	0.00	0.45	0.62	0.57	0.00	1.22			
Avail Cap(c_a), veh/h	170	1938	0	0	1379	617	863	0	816			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.81	0.81	1.00	0.00	1.00			
Uniform Delay (d), s/veh	26.9	11.4	0.0	0.0	9.8	10.7	19.0	0.0	22.0			
Incr Delay (d2), s/veh	122.4	6.9	0.0	0.0	0.9	3.7	2.7	0.0	108.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	8.6	14.1	0.0	0.0	3.3	4.9	3.8	0.0	19.0			
LnGrp Delay(d),s/veh	149.2	18.3	0.0	0.0	10.7	14.4	21.7	0.0	130.7			
LnGrp LOS	F	B			B	B	C		F			
Approach Vol, veh/h		1933			1004			1482				
Approach Delay, s/veh		31.8			12.1			94.7				
Approach LOS		C			B			F				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		39.0			9.8	29.2		21.0				
Change Period (Y+Rc), s		5.0			3.5	5.0		5.0				
Max Green Setting (Gmax), s		34.0			6.3	24.2		16.0				
Max Q Clear Time (g_c+I1), s		28.7			8.3	12.4		18.0				
Green Ext Time (p_c), s		4.9			0.0	10.5		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			48.4									
HCM 2010 LOS			D									
Notes												

Timings
3: E St. & Orange Show Rd.

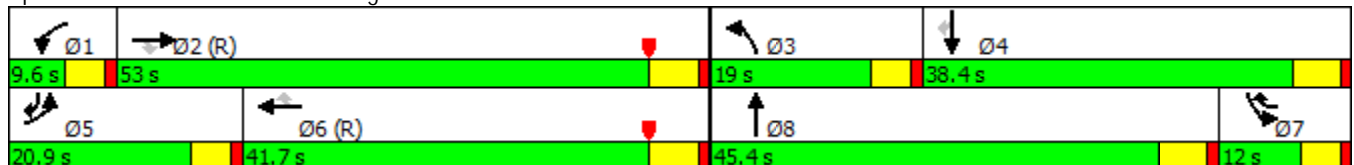


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑	↗	↔↔	↑↑	↗	↗	↑↑	↔↔	↑↑	↗
Traffic Volume (vph)	429	1345	808	98	574	68	137	201	74	230	202
Future Volume (vph)	429	1345	808	98	574	68	137	201	74	230	202
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8	7	4	5
Permitted Phases			2			6					4
Detector Phase	5	2	2	1	6	7	3	8	7	4	5
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0
Minimum Split (s)	9.6	39.4	39.4	9.6	39.4	9.6	9.6	38.4	9.6	38.4	9.6
Total Split (s)	20.9	53.0	53.0	9.6	41.7	12.0	19.0	45.4	12.0	38.4	20.9
Total Split (%)	17.4%	44.2%	44.2%	8.0%	34.8%	10.0%	15.8%	37.8%	10.0%	32.0%	17.4%
Yellow Time (s)	3.6	4.4	4.4	3.6	4.4	3.6	3.6	4.4	3.6	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4	4.6	5.4	4.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	Max	None	Max	None
Act Effect Green (s)	16.3	47.6	47.6	5.0	36.3	44.5	13.3	40.0	7.4	34.1	55.8
Actuated g/C Ratio	0.14	0.40	0.40	0.04	0.30	0.37	0.11	0.33	0.06	0.28	0.46
v/c Ratio	1.12	1.07	0.89	0.83	0.60	0.10	0.83	0.29	0.43	0.26	0.26
Control Delay	112.7	71.8	20.2	99.4	46.6	5.5	84.7	21.0	61.3	34.4	11.8
Queue Delay	0.0	12.8	16.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	112.7	84.6	36.6	99.4	46.6	5.5	84.7	21.0	61.3	34.4	11.8
LOS	F	F	D	F	D	A	F	C	E	C	B
Approach Delay		74.3			49.8			40.1		29.3	
Approach LOS		E			D			D		C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 92 (77%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.12
 Intersection Signal Delay: 61.1
 Intersection LOS: E
 Intersection Capacity Utilization 91.7%
 ICU Level of Service F
 Analysis Period (min) 15































Splits and Phases: 3: E St. & Orange Show Rd.



























HCM Signalized Intersection Capacity Analysis
3: E St. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 			 		 	 	
Traffic Volume (vph)	429	1345	808	98	574	68	137	201	119	74	230	202
Future Volume (vph)	429	1345	808	98	574	68	137	201	119	74	230	202
Ideal Flow (vphp)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Total Lost time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95		0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3200	3600	1800	3200	3600	1800	1700	3600		3200	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3200	3600	1800	3200	3600	1800	1700	3600		3200	3600	1800
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	488	1528	918	111	652	77	156	228	135	84	261	230
RTOR Reduction (vph)	0	0	316	0	0	49	0	72	0	0	0	58
Lane Group Flow (vph)	488	1528	602	111	652	28	156	291	0	84	261	172
Confl. Peds. (#/hr)									2			
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	16.3	47.6	47.6	5.0	36.3	43.7	13.3	40.0		7.4	34.1	50.4
Effective Green, g (s)	16.3	47.6	47.6	5.0	36.3	43.7	13.3	40.0		7.4	34.1	50.4
Actuated g/C Ratio	0.14	0.40	0.40	0.04	0.30	0.36	0.11	0.33		0.06	0.28	0.42
Clearance Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	2.0	2.0	3.0		2.0	3.0	2.0
Lane Grp Cap (vph)	434	1428	714	133	1089	655	188	1200		197	1023	756
v/s Ratio Prot	c0.15	c0.42		0.03	0.18	0.00	c0.09	0.08		c0.03	c0.07	0.03
v/s Ratio Perm			0.33			0.01						0.06
v/c Ratio	1.12	1.07	0.84	0.83	0.60	0.04	0.83	0.24		0.43	0.26	0.23
Uniform Delay, d1	51.9	36.2	32.8	57.1	35.6	24.6	52.2	29.0		54.3	33.1	22.3
Progression Factor	0.98	0.98	1.09	1.06	1.24	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	66.7	37.1	4.4	29.4	2.1	0.0	24.0	0.5		0.5	0.6	0.1
Delay (s)	117.3	72.5	40.0	90.0	46.2	24.6	76.3	29.5		54.8	33.7	22.4
Level of Service	F	E	D	F	D	C	E	C		D	C	C
Approach Delay (s)		69.8			50.0			43.5			32.3	
Approach LOS		E			D			D			C	
Intersection Summary												
HCM 2000 Control Delay			59.1									E
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			120.0							20.0		
Intersection Capacity Utilization			91.7%									F
Analysis Period (min)			15									
c Critical Lane Group												

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	429	1345	808	98	574	68	137	201	119	74	230	202
Future Volume (veh/h)	429	1345	808	98	574	68	137	201	119	74	230	202
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	488	1528	667	111	652	46	156	228	103	84	261	208
Adj No. of Lanes	2	2	1	2	2	1	1	2	0	2	2	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	402	1368	612	123	1045	547	178	772	338	153	940	629
Arrive On Green	0.27	0.80	0.80	0.08	0.61	0.61	0.12	0.33	0.33	0.05	0.28	0.28
Sat Flow, veh/h	2956	3420	1530	2956	3420	1530	1524	2316	1013	2956	3420	1530
Grp Volume(v), veh/h	488	1528	667	111	652	46	156	166	165	84	261	208
Grp Sat Flow(s),veh/h/ln	1478	1710	1530	1478	1710	1530	1524	1710	1619	1478	1710	1530
Q Serve(g_s), s	16.3	48.0	48.0	4.5	14.4	0.4	12.1	8.6	9.1	3.3	7.2	11.1
Cycle Q Clear(g_c), s	16.3	48.0	48.0	4.5	14.4	0.4	12.1	8.6	9.1	3.3	7.2	11.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.63	1.00		1.00
Lane Grp Cap(c), veh/h	402	1368	612	123	1045	547	178	570	540	153	941	629
V/C Ratio(X)	1.22	1.12	1.09	0.90	0.62	0.08	0.88	0.29	0.31	0.55	0.28	0.33
Avail Cap(c_a), veh/h	402	1368	612	123	1045	547	183	570	540	182	941	629
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.19	0.19	0.19	0.83	0.83	0.83	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.7	12.0	12.0	54.8	19.0	5.9	52.1	29.5	29.7	55.5	34.1	24.1
Incr Delay (d2), s/veh	101.6	55.1	46.6	45.2	2.3	0.3	32.9	1.3	1.5	1.1	0.7	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.2	31.7	26.6	2.6	7.0	0.4	6.7	4.3	4.2	1.4	3.5	4.9
LnGrp Delay(d),s/veh	145.3	67.1	58.6	99.9	21.3	6.2	85.0	30.8	31.1	56.7	34.9	25.5
LnGrp LOS	F	F	F	F	C	A	F	C	C	E	C	C
Approach Vol, veh/h		2683			809			487			553	
Approach Delay, s/veh		79.2			31.2			48.3			34.7	
Approach LOS		E			C			D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.6	53.4	18.6	38.4	20.9	42.1	11.6	45.4				
Change Period (Y+Rc), s	4.6	5.4	4.6	5.4	4.6	5.4	5.4	* 5.4				
Max Green Setting (Gmax), s	5.0	47.6	14.4	33.0	16.3	36.3	7.4	* 40				
Max Q Clear Time (g_c+I1), s	6.5	50.0	14.1	13.1	18.3	16.4	5.3	11.1				
Green Ext Time (p_c), s	0.0	0.0	0.0	2.3	0.0	18.5	0.6	1.9				
Intersection Summary												
HCM 2010 Ctrl Delay			61.9									
HCM 2010 LOS			E									
Notes												

Timings
4: Arrowhead Av. & Orange Show Rd.

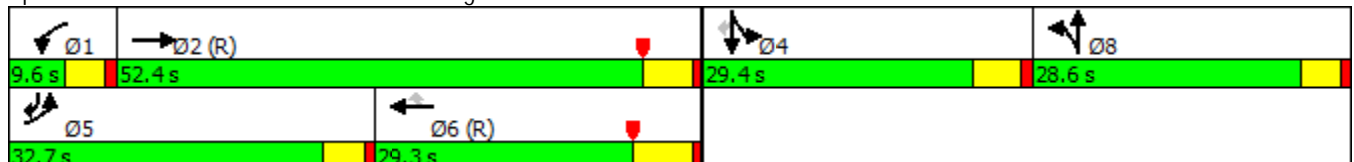


Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	418	1062	5	402	182	1	176	12	321
Future Volume (vph)	418	1062	5	402	182	1	176	12	321
Turn Type	Prot	NA	Prot	NA	Perm	NA	Split	NA	pm+ov
Protected Phases	5	2	1	6		8	4	4	5
Permitted Phases					6				4
Detector Phase	5	2	1	6	6	8	4	4	5
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	28.4	9.6	29.2	29.2	28.6	29.4	29.4	9.6
Total Split (s)	32.7	52.4	9.6	29.3	29.3	28.6	29.4	29.4	32.7
Total Split (%)	27.3%	43.7%	8.0%	24.4%	24.4%	23.8%	24.5%	24.5%	27.3%
Yellow Time (s)	3.6	4.4	3.6	5.2	5.2	3.6	4.4	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	6.2	6.2	4.6	5.4	5.4	4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag				Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				Yes
Recall Mode	None	C-Max	None	C-Max	C-Max	Max	Max	Max	None
Act Effct Green (s)	28.1	54.7	5.0	23.1	23.1	24.0	24.0	24.0	52.9
Actuated g/C Ratio	0.23	0.46	0.04	0.19	0.19	0.20	0.20	0.20	0.44
v/c Ratio	1.19	0.74	0.09	0.66	0.40	0.02	0.31	0.30	0.37
Control Delay	148.7	36.8	58.0	50.0	8.0	25.0	43.9	43.6	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	148.7	36.8	58.0	50.0	8.0	25.0	43.9	43.6	2.1
LOS	F	D	E	D	A	C	D	D	A
Approach Delay		68.3		37.1		25.0		17.5	
Approach LOS		E		D		C		B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 86 (72%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.19
 Intersection Signal Delay: 51.1
 Intersection Capacity Utilization 71.1%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service C

Splits and Phases: 4: Arrowhead Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
4: Arrowhead Av. & Orange Show Rd.



























Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↖	↖	↗		↖	↗	↖
Traffic Volume (vph)	418	1062	8	5	402	182	0	1	4	176	12	321
Future Volume (vph)	418	1062	8	5	402	182	0	1	4	176	12	321
Ideal Flow (vphp)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	6.2	6.2		4.6		5.4	5.4	4.6
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00		0.98		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.88		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00		0.95	0.96	1.00
Satd. Flow (prot)	1700	3600		1700	3600	1800		1800		1700	1800	1800
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00		0.95	0.96	1.00
Satd. Flow (perm)	1700	3600		1700	3600	1800		1800		1700	1800	1800
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	475	1207	9	6	457	207	0	1	5	200	14	365
RTOR Reduction (vph)	0	1	0	0	0	167	0	4	0	0	0	207
Lane Group Flow (vph)	475	1215	0	6	457	40	0	2	0	106	108	158
Confl. Peds. (#/hr)									6			7
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		8	8		4	4	5
Permitted Phases						6						4
Actuated Green, G (s)	28.1	51.0		1.0	23.1	23.1		24.0		24.0	24.0	52.1
Effective Green, g (s)	28.1	51.0		1.0	23.1	23.1		24.0		24.0	24.0	52.1
Actuated g/C Ratio	0.23	0.42		0.01	0.19	0.19		0.20		0.20	0.20	0.43
Clearance Time (s)	4.6	5.4		4.6	6.2	6.2		4.6		5.4	5.4	4.6
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0		3.0		3.0	3.0	2.0
Lane Grp Cap (vph)	398	1530		14	693	346		360		340	360	781
v/s Ratio Prot	c0.28	c0.34		0.00	0.13			c0.00		c0.06	0.06	0.05
v/s Ratio Perm						0.02						0.04
v/c Ratio	1.19	0.79		0.43	0.66	0.12		0.01		0.31	0.30	0.20
Uniform Delay, d1	46.0	29.9		59.2	44.8	40.0		38.4		41.0	40.9	21.1
Progression Factor	1.46	1.30		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	94.0	1.2		7.5	4.9	0.7		0.0		2.4	2.1	0.0
Delay (s)	161.2	40.1		66.7	49.7	40.7		38.5		43.3	43.0	21.1
Level of Service	F	D		E	D	D		D		D	D	C
Approach Delay (s)		74.1			47.1			38.5			29.3	
Approach LOS		E			D			D			C	

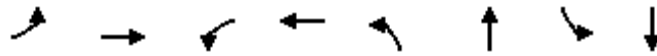
Intersection Summary		
HCM 2000 Control Delay	59.1	HCM 2000 Level of Service E
HCM 2000 Volume to Capacity ratio	0.63	
Actuated Cycle Length (s)	120.0	Sum of lost time (s) 20.8
Intersection Capacity Utilization	71.1%	ICU Level of Service C
Analysis Period (min)	15	
c Critical Lane Group		

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (veh/h)	418	1062	8	5	402	182	0	1	4	176	12	321
Future Volume (veh/h)	418	1062	8	5	402	182	0	1	4	176	12	321
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	475	1207	8	6	457	187	0	1	5	210	0	271
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	379	1460	10	12	658	295	324	52	260	648	0	661
Arrive On Green	0.31	0.56	0.56	0.01	0.19	0.19	0.00	0.20	0.20	0.20	0.00	0.20
Sat Flow, veh/h	1619	3483	23	1619	3420	1530	1619	260	1298	3238	0	1514
Grp Volume(v), veh/h	475	593	622	6	457	187	0	0	6	210	0	271
Grp Sat Flow(s),veh/h/ln	1619	1710	1796	1619	1710	1530	1619	0	1557	1619	0	1514
Q Serve(g_s), s	28.1	34.1	34.1	0.4	14.9	13.5	0.0	0.0	0.4	6.7	0.0	14.8
Cycle Q Clear(g_c), s	28.1	34.1	34.1	0.4	14.9	13.5	0.0	0.0	0.4	6.7	0.0	14.8
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.83	1.00		1.00
Lane Grp Cap(c), veh/h	379	717	753	12	658	295	324	0	311	648	0	661
V/C Ratio(X)	1.25	0.83	0.83	0.49	0.69	0.63	0.00	0.00	0.02	0.32	0.00	0.41
Avail Cap(c_a), veh/h	379	717	753	67	658	295	324	0	311	648	0	661
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.09	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.3	23.0	23.0	59.3	45.2	44.6	0.0	0.0	38.6	41.1	0.0	23.4
Incr Delay (d2), s/veh	115.9	1.1	1.0	10.9	5.9	10.0	0.0	0.0	0.1	1.3	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	24.7	16.2	17.0	0.2	7.6	6.5	0.0	0.0	0.2	3.1	0.0	6.5
LnGrp Delay(d),s/veh	157.2	24.0	24.0	70.2	51.1	54.6	0.0	0.0	38.7	42.4	0.0	25.3
LnGrp LOS	F	C	C	E	D	D			D	D		C
Approach Vol, veh/h		1690			650			6			481	
Approach Delay, s/veh		61.4			52.3			38.7			32.7	
Approach LOS		E			D			D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.5	56.5		29.4	32.7	29.3		28.6				
Change Period (Y+Rc), s	4.6	* 6.2		5.4	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.0	* 47		24.0	28.1	23.1		24.0				
Max Q Clear Time (g_c+I1), s	2.4	36.1		16.8	30.1	16.9		2.4				
Green Ext Time (p_c), s	0.0	8.8		1.0	0.0	5.3		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			54.4									
HCM 2010 LOS			D									
Notes												

Timings

5: Washington Av./Washington Av. & Orange Show Rd.

3/27/2017

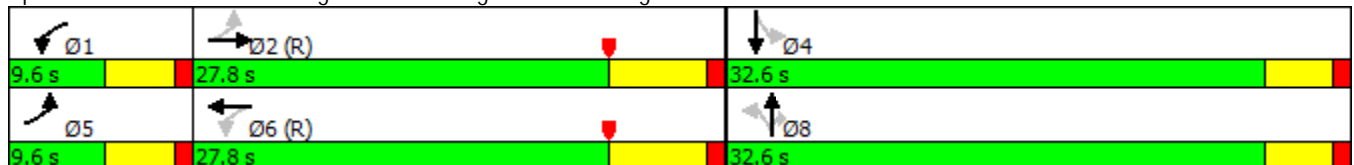


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↕	↖	↕		↕		↕
Traffic Volume (vph)	59	1367	4	503	11	4	14	3
Future Volume (vph)	59	1367	4	503	11	4	14	3
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	9.6	23.2	32.6	32.6	32.6	32.6
Total Split (s)	9.6	27.8	9.6	27.8	32.6	32.6	32.6	32.6
Total Split (%)	13.7%	39.7%	13.7%	39.7%	46.6%	46.6%	46.6%	46.6%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effect Green (s)	58.7	56.2	57.7	51.0		13.6		13.6
Actuated g/C Ratio	0.84	0.80	0.82	0.73		0.19		0.19
v/c Ratio	0.04	0.52	0.00	0.22		0.05		0.08
Control Delay	5.4	11.4	6.8	8.4		19.5		15.3
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	5.4	11.4	6.8	8.4		19.5		15.3
LOS	A	B	A	A		B		B
Approach Delay		11.2		8.4		19.5		15.3
Approach LOS		B		A		B		B

Intersection Summary

Cycle Length: 70
 Actuated Cycle Length: 70
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.52
 Intersection Signal Delay: 10.6
 Intersection LOS: B
 Intersection Capacity Utilization 66.0%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 5: Washington Av./Washington Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 5: Washington Av./Washington Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕		↖	↕			↕	↗		↕	↗
Traffic Volume (vph)	59	1367	23	4	503	22	11	4	0	14	3	8
Future Volume (vph)	59	1367	23	4	503	22	11	4	0	14	3	8
Ideal Flow (vphp)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2		4.6	6.2			4.6			4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			1.00			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.97	
Satd. Flow (prot)	1700	3600		1700	3600			1800			1800	
Flt Permitted	0.42	1.00		0.13	1.00			0.79			0.83	
Satd. Flow (perm)	1700	3600		1700	3600			1800			1800	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	63	1470	25	4	541	24	12	4	0	15	3	9
RTOR Reduction (vph)	0	1	0	0	3	0	0	0	0	0	8	0
Lane Group Flow (vph)	63	1494	0	4	562	0	0	16	0	0	19	0
Confl. Peds. (#/hr)			1									
Confl. Bikes (#/hr)			1			1						
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)	49.1	46.0		44.9	43.9			7.6			7.6	
Effective Green, g (s)	49.1	46.0		44.9	43.9			7.6			7.6	
Actuated g/C Ratio	0.70	0.66		0.64	0.63			0.11			0.11	
Clearance Time (s)	4.6	6.2		4.6	6.2			4.6			4.6	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	1192	2365		1090	2257			195			195	
v/s Ratio Prot	c0.00	c0.42		0.00	0.16							
v/s Ratio Perm	0.03			0.00				0.01			0.01	
v/c Ratio	0.05	0.63		0.00	0.25			0.08			0.10	
Uniform Delay, d1	3.3	7.0		5.3	5.8			28.1			28.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	1.3		0.0	0.3			0.2			0.2	
Delay (s)	3.3	8.3		5.3	6.0			28.2			28.3	
Level of Service	A	A		A	A			C			C	
Approach Delay (s)		8.1			6.0			28.2			28.3	
Approach LOS		A			A			C			C	




















Intersection Summary		
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.55	A
Actuated Cycle Length (s)	70.0	Sum of lost time (s)
Intersection Capacity Utilization	66.0%	15.4
Analysis Period (min)	15	ICU Level of Service
		C

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
 5: Washington Av./Washington Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	1367	23	4	503	22	11	4	0	14	3	8
Future Volume (veh/h)	59	1367	23	4	503	22	11	4	0	14	3	8
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	63	1470	25	4	541	24	12	4	0	15	3	1
Adj No. of Lanes	1	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	666	2422	41	274	2196	97	160	40	108	166	27	6
Arrive On Green	0.05	0.70	0.70	0.01	0.66	0.66	0.07	0.07	0.00	0.07	0.07	0.07
Sat Flow, veh/h	1619	3440	58	1619	3333	148	988	565	1530	1052	389	80
Grp Volume(v), veh/h	63	730	765	4	277	288	16	0	0	19	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1788	1619	1710	1770	1553	0	1530	1522	0	0
Q Serve(g_s), s	0.8	15.4	15.5	0.1	4.6	4.6	0.0	0.0	0.0	0.1	0.0	0.0
Cycle Q Clear(g_c), s	0.8	15.4	15.5	0.1	4.6	4.6	0.6	0.0	0.0	0.7	0.0	0.0
Prop In Lane	1.00		0.03	1.00		0.08	0.75		1.00	0.79		0.05
Lane Grp Cap(c), veh/h	666	1204	1259	274	1127	1167	200	0	108	199	0	0
V/C Ratio(X)	0.09	0.61	0.61	0.01	0.25	0.25	0.08	0.00	0.00	0.10	0.00	0.00
Avail Cap(c_a), veh/h	700	1204	1259	381	1127	1167	698	0	612	689	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.68	0.68	0.68	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	3.1	5.3	5.4	5.1	4.9	4.9	30.5	0.0	0.0	30.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	2.3	2.2	0.0	0.4	0.3	0.2	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	7.9	8.2	0.0	2.3	2.3	0.3	0.0	0.0	0.4	0.0	0.0
LnGrp Delay(d),s/veh	3.1	7.6	7.5	5.1	5.2	5.2	30.7	0.0	0.0	30.8	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C			C		
Approach Vol, veh/h		1558			569			16			19	
Approach Delay, s/veh		7.4			5.2			30.7			30.8	
Approach LOS		A			A			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.0	55.5		9.5	8.1	52.3		9.5				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.0	21.6		28.0	5.0	21.6		28.0				
Max Q Clear Time (g_c+I1), s	2.1	17.5		2.7	2.8	6.6		2.6				
Green Ext Time (p_c), s	0.0	3.8		0.1	0.0	12.3		0.1				
Intersection Summary												
HCM 2010 Ctrl Delay				7.2								
HCM 2010 LOS				A								

Intersection

Int Delay, s/veh 6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↔	
Traffic Vol, veh/h	0	0	0	0	0	13	0	0	0	29	0	0
Future Vol, veh/h	0	0	0	0	0	13	0	0	0	29	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	70	70	70	70	70	70	70	70	70	70	70
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	19	0	0	0	41	0	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	19	0	9
Stage 1	-	-	9
Stage 2	-	-	0
Critical Hdwy	4.1	-	6.4
Critical Hdwy Stg 1	-	-	5.4
Critical Hdwy Stg 2	-	-	5.4
Follow-up Hdwy	2.2	-	3.5
Pot Cap-1 Maneuver	1611	0	1017
Stage 1	-	0	1019
Stage 2	-	0	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1611	-	1017
Mov Cap-2 Maneuver	-	-	1017
Stage 1	-	-	1019
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1611	-	-	-	1017
HCM Lane V/C Ratio	-	-	-	-	0.041
HCM Control Delay (s)	0	-	-	-	8.7
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Timings

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.

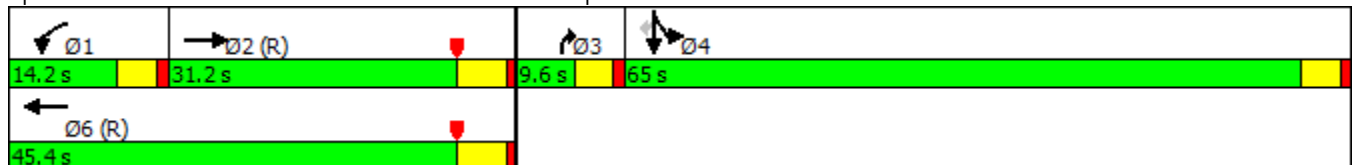


Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↘	↑↑	↗	↘	↗	↗
Traffic Volume (vph)	569	41	616	26	802	364	765
Future Volume (vph)	569	41	616	26	802	364	765
Turn Type	NA	Prot	NA	Prot	Split	NA	Perm
Protected Phases	2	1	6	3	4	4	
Permitted Phases							4
Detector Phase	2	1	6	3	4	4	4
Switch Phase							
Minimum Initial (s)	10.0	5.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	22.4	9.6	15.4	9.5	14.6	14.6	14.6
Total Split (s)	31.2	14.2	45.4	9.6	65.0	65.0	65.0
Total Split (%)	26.0%	11.8%	37.8%	8.0%	54.2%	54.2%	54.2%
Yellow Time (s)	4.4	3.6	4.4	3.5	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	4.6	5.4	4.5	4.6	4.6	4.6
Lead/Lag	Lag	Lead		Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes
Recall Mode	C-Max	None	C-Max	None	Max	Max	Max
Act Effect Green (s)	29.8	7.5	40.0	5.1	64.2	64.2	64.2
Actuated g/C Ratio	0.25	0.06	0.33	0.04	0.54	0.54	0.54
v/c Ratio	0.73	0.42	0.56	0.11	0.69	0.66	0.79
Control Delay	47.8	65.9	34.9	0.9	26.6	25.3	23.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.8	65.9	34.9	0.9	26.6	25.3	23.9
LOS	D	E	C	A	C	C	C
Approach Delay	47.8		36.9			25.1	
Approach LOS	D		D			C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 31.6
 Intersection LOS: C
 Intersection Capacity Utilization 76.3%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.






















HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑				↗	↖	↗	↗
Traffic Volume (vph)	0	569	39	41	616	0	0	0	26	802	364	765
Future Volume (vph)	0	569	39	41	616	0	0	0	26	802	364	765
Ideal Flow (vphpl)	1800	1800	1800	1700	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Lane Util. Factor		0.95		1.00	0.95				1.00	0.95	0.95	1.00
Frbp, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Frt		0.99		1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00				1.00	0.95	0.98	1.00
Satd. Flow (prot)		3600		1700	3600				1800	1700	1800	1800
Flt Permitted		1.00		0.95	1.00				1.00	0.95	0.98	1.00
Satd. Flow (perm)		3600		1700	3600				1800	1700	1800	1800
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	618	42	45	670	0	0	0	28	872	396	832
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	27	0	0	94
Lane Group Flow (vph)	0	656	0	45	670	0	0	0	1	628	640	738
Confl. Peds. (#/hr)			6			1						
Confl. Bikes (#/hr)						2						
Turn Type		NA		Prot	NA				Prot	Split	NA	Perm
Protected Phases		2		1	6				3	4	4	
Permitted Phases												4
Actuated Green, G (s)		27.1		6.5	38.2				3.1	64.2	64.2	64.2
Effective Green, g (s)		27.1		6.5	38.2				3.1	64.2	64.2	64.2
Actuated g/C Ratio		0.23		0.05	0.32				0.03	0.54	0.54	0.54
Clearance Time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Vehicle Extension (s)		3.0		2.0	3.0				3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		813		92	1146				46	909	963	963
v/s Ratio Prot		c0.18		0.03	c0.19				c0.00	0.37	0.36	
v/s Ratio Perm												c0.41
v/c Ratio		0.81		0.49	0.58				0.02	0.69	0.66	0.77
Uniform Delay, d1		44.0		55.1	34.3				57.0	20.6	20.1	22.0
Progression Factor		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		8.4		1.5	2.2				0.1	4.3	3.6	5.8
Delay (s)		52.4		56.6	36.4				57.1	24.9	23.7	27.8
Level of Service		D		E	D				E	C	C	C
Approach Delay (s)		52.4			37.7			57.1			25.7	
Approach LOS		D			D			E			C	

Intersection Summary			
HCM 2000 Control Delay	33.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.1
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	569	39	41	616	0	0	0	26	802	364	765
Future Volume (veh/h)	0	569	39	41	616	0	0	0	26	802	364	765
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	0	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	618	31	45	670	0	0	0	15	634	729	830
Adj No. of Lanes	0	2	0	1	2	0	0	0	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1128	57	56	1414	0	0	0	0	815	906	770
Arrive On Green	0.00	0.34	0.34	0.03	0.41	0.00	0.00	0.00	0.00	0.50	0.50	0.50
Sat Flow, veh/h	0	3403	166	1619	3510	0		0		1619	1800	1530
Grp Volume(v), veh/h	0	319	330	45	670	0		0.0		634	729	830
Grp Sat Flow(s),veh/h/ln	0	1710	1769	1619	1710	0				1619	1800	1530
Q Serve(g_s), s	0.0	18.1	18.2	3.3	17.2	0.0				38.4	40.6	60.4
Cycle Q Clear(g_c), s	0.0	18.1	18.2	3.3	17.2	0.0				38.4	40.6	60.4
Prop In Lane	0.00		0.09	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	582	602	56	1414	0				815	906	770
V/C Ratio(X)	0.00	0.55	0.55	0.81	0.47	0.00				0.78	0.80	1.08
Avail Cap(c_a), veh/h	0	582	602	130	1414	0				815	906	770
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.60	0.60	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	32.1	32.1	57.5	25.7	0.0				24.3	24.9	29.8
Incr Delay (d2), s/veh	0.0	3.7	3.6	6.0	0.7	0.0				7.2	7.5	55.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.2	9.5	1.6	8.2	0.0				18.7	21.9	37.1
LnGrp Delay(d),s/veh	0.0	35.7	35.6	63.6	26.4	0.0				31.5	32.4	85.2
LnGrp LOS		D	D	E	C					C	C	F
Approach Vol, veh/h		649			715						2193	
Approach Delay, s/veh		35.7			28.7						52.2	
Approach LOS		D			C						D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	8.7	46.3		65.0		55.0						
Change Period (Y+Rc), s	4.6	5.4		4.6		5.4						
Max Green Setting (Gmax), s	9.6	25.8		60.4		40.0						
Max Q Clear Time (g_c+I1), s	5.3	20.2		62.4		19.2						
Green Ext Time (p_c), s	0.0	3.5		0.0		8.3						
Intersection Summary												
HCM 2010 Ctrl Delay			44.4									
HCM 2010 LOS			D									
Notes												

Timings

9: Waterman Av. & Orange Show Rd./Orange Show Rd.

3/27/2017

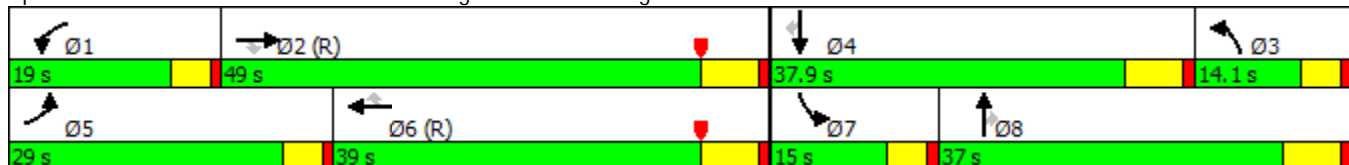


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑	↗	↘	↑↑	↗	↘	↑↑	↗
Traffic Volume (vph)	211	525	369	141	346	93	112	703	105	101	826	107
Future Volume (vph)	211	525	369	141	346	93	112	703	105	101	826	107
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.2	35.2	9.6	35.2	35.2	9.6	33.2	33.2	9.6	33.2	33.2
Total Split (s)	29.0	49.0	49.0	19.0	39.0	39.0	14.1	37.0	37.0	15.0	37.9	37.9
Total Split (%)	24.2%	40.8%	40.8%	15.8%	32.5%	32.5%	11.8%	30.8%	30.8%	12.5%	31.6%	31.6%
Yellow Time (s)	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Act Effect Green (s)	20.6	43.5	43.5	13.7	36.6	36.6	9.5	31.2	31.2	10.0	31.7	31.7
Actuated g/C Ratio	0.17	0.36	0.36	0.11	0.30	0.30	0.08	0.26	0.26	0.08	0.26	0.26
v/c Ratio	0.84	0.47	0.54	0.85	0.73	0.16	0.97	0.87	0.21	0.83	1.01	0.21
Control Delay	71.9	31.0	16.2	87.0	47.6	0.5	125.7	54.1	3.3	94.8	75.6	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.9	31.0	16.2	87.0	47.6	0.5	125.7	54.1	3.3	94.8	75.6	2.6
LOS	E	C	B	F	D	A	F	D	A	F	E	A
Approach Delay		33.8			49.6			57.0			69.9	
Approach LOS		C			D			E			E	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.01
 Intersection Signal Delay: 52.5
 Intersection LOS: D
 Intersection Capacity Utilization 81.3%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	211	525	369	141	346	93	112	703	105	101	826	107
Future Volume (vph)	211	525	369	141	346	93	112	703	105	101	826	107
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	245	610	429	164	402	108	130	817	122	117	960	124
RTOR Reduction (vph)	0	0	147	0	0	75	0	0	90	0	0	91
Lane Group Flow (vph)	245	610	282	164	402	33	130	817	32	117	960	33
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	20.6	43.5	43.5	13.7	36.6	36.6	9.5	31.2	31.2	10.0	31.7	31.7
Effective Green, g (s)	20.6	43.5	43.5	13.7	36.6	36.6	9.5	31.2	31.2	10.0	31.7	31.7
Actuated g/C Ratio	0.17	0.36	0.36	0.11	0.31	0.31	0.08	0.26	0.26	0.08	0.26	0.26
Clearance Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	291	1305	652	194	549	549	134	936	468	141	951	475
v/s Ratio Prot	c0.14	0.17		0.10	c0.22		c0.08	0.23		0.07	c0.27	
v/s Ratio Perm			0.16			0.02			0.02			0.02
v/c Ratio	0.84	0.47	0.43	0.85	0.73	0.06	0.97	0.87	0.07	0.83	1.01	0.07
Uniform Delay, d1	48.1	29.4	28.9	52.1	37.3	29.5	55.1	42.5	33.4	54.2	44.1	33.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	18.6	1.2	2.1	26.2	8.4	0.2	68.1	11.1	0.3	30.2	31.5	0.3
Delay (s)	66.7	30.6	31.0	78.3	45.7	29.7	123.2	53.6	33.7	84.3	75.7	33.4
Level of Service	E	C	C	E	D	C	F	D	C	F	E	C
Approach Delay (s)		37.6			51.1			59.8			72.2	
Approach LOS		D			D			E			E	

Intersection Summary

























HCM 2000 Control Delay	55.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	211	525	369	141	346	93	112	703	105	101	826	107
Future Volume (veh/h)	211	525	369	141	346	93	112	703	105	101	826	107
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	245	610	330	164	402	67	130	817	86	117	960	101
Adj No. of Lanes	1	2	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	269	2259	1011	188	1098	933	128	925	414	139	903	404
Arrive On Green	0.17	0.66	0.66	0.12	0.61	0.61	0.08	0.27	0.27	0.09	0.26	0.26
Sat Flow, veh/h	1619	3420	1530	1619	1800	1530	1619	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	245	610	330	164	402	67	130	817	86	117	960	101
Grp Sat Flow(s),veh/h/ln	1619	1710	1530	1619	1800	1530	1619	1710	1530	1619	1710	1530
Q Serve(g_s), s	17.8	8.8	15.5	12.0	13.5	2.1	9.5	27.5	5.2	8.5	31.7	6.7
Cycle Q Clear(g_c), s	17.8	8.8	15.5	12.0	13.5	2.1	9.5	27.5	5.2	8.5	31.7	6.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	269	2259	1011	188	1098	933	128	925	414	139	903	404
V/C Ratio(X)	0.91	0.27	0.33	0.87	0.37	0.07	1.01	0.88	0.21	0.84	1.06	0.25
Avail Cap(c_a), veh/h	329	2259	1011	194	1098	933	128	925	414	140	903	404
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.84	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.1	8.4	16.9	52.2	11.7	9.5	55.3	41.9	33.8	54.0	44.1	40.4
Incr Delay (d2), s/veh	20.1	0.2	0.7	30.8	0.9	0.1	83.3	11.9	1.1	32.4	48.0	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.5	4.2	6.7	6.9	6.9	0.9	7.2	14.5	2.3	5.1	21.0	3.0
LnGrp Delay(d),s/veh	69.2	8.7	17.6	82.9	12.7	9.7	138.7	53.9	35.0	86.4	92.2	41.8
LnGrp LOS	E	A	B	F	B	A	F	D	C	F	F	D
Approach Vol, veh/h		1185			633			1033			1178	
Approach Delay, s/veh		23.7			30.6			63.0			87.3	
Approach LOS		C			C			E			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.5	86.6	15.7	37.9	24.6	80.5	14.9	38.7				
Change Period (Y+Rc), s	4.6	6.2	6.2	* 6.2	4.6	6.2	4.6	6.2				
Max Green Setting (Gmax), s	14.4	42.8	9.5	* 32	24.4	32.8	10.4	30.8				
Max Q Clear Time (g_c+I1), s	14.0	17.5	11.5	33.7	19.8	15.5	10.5	29.5				
Green Ext Time (p_c), s	0.0	11.7	0.0	0.0	0.1	9.5	0.0	0.7				
Intersection Summary												
HCM 2010 Ctrl Delay			53.4									
HCM 2010 LOS			D									
Notes												

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	4	13	8	916	1391	18
Future Vol, veh/h	4	13	8	916	1391	18
Conflicting Peds, #/hr	0	0	0	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	75	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	16	10	1145	1739	23

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	2345	883	1763 0
Stage 1	1752	-	-
Stage 2	593	-	-
Critical Hdwy	6.8	6.9	4.1 -
Critical Hdwy Stg 1	5.8	-	-
Critical Hdwy Stg 2	5.8	-	-
Follow-up Hdwy	3.5	3.3	2.2 -
Pot Cap-1 Maneuver	*31	*516	559 -
Stage 1	*321	-	-
Stage 2	*704	-	-
Platoon blocked, %		1	1 -
Mov Cap-1 Maneuver	*30	*515	559 -
Mov Cap-2 Maneuver	*211	-	-
Stage 1	*320	-	-
Stage 2	*690	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.6	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	559	-	211	515	-	-
HCM Lane V/C Ratio	0.018	-	0.024	0.032	-	-
HCM Control Delay (s)	11.6	-	22.5	12.2	-	-
HCM Lane LOS	B	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	0.1	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Timings
11: Waterman Av. & Driveway 2/Park Center Dr.



Lane Group	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	Ø4
Lane Configurations		↖	↗	↖	↗	↗	↖	↗	
Traffic Volume (vph)	21	1	10	25	889	144	57	1073	
Future Volume (vph)	21	1	10	25	889	144	57	1073	
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		8		5	2		1	6	4
Permitted Phases	8		8	2		2	6		
Detector Phase	8	8	8	5	2	2	1	6	
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	21.6	21.6	21.6	9.6	23.2	23.2	9.6	33.2	14.6
Total Split (s)	21.6	21.6	21.6	9.6	32.0	32.0	11.4	33.8	21.6
Total Split (%)	33.2%	33.2%	33.2%	14.8%	49.2%	49.2%	17.5%	52.0%	33%
Yellow Time (s)	3.6	3.6	3.6	3.6	5.2	5.2	3.6	5.2	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Lead/Lag				Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?				Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	C-Max	C-Max	None	C-Max	None
Act Effect Green (s)		11.4	11.4	46.9	44.8	44.8	50.7	47.3	
Actuated g/C Ratio		0.18	0.18	0.72	0.69	0.69	0.78	0.73	
v/c Ratio		0.09	0.03	0.10	0.44	0.14	0.05	0.51	
Control Delay		21.7	0.1	5.0	10.2	3.3	4.0	10.1	
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		21.7	0.1	5.0	10.2	3.3	4.0	10.1	
LOS		C	A	A	B	A	A	B	
Approach Delay		15.1			9.1			9.8	
Approach LOS		B			A			A	

Intersection Summary

Cycle Length: 65
 Actuated Cycle Length: 65
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.51
 Intersection Signal Delay: 9.5
 Intersection LOS: A
 Intersection Capacity Utilization 56.8%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 11: Waterman Av. & Driveway 2/Park Center Dr.



HCM Signalized Intersection Capacity Analysis
 11: Waterman Av. & Driveway 2/Park Center Dr.






















Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↕	↕	↕	↕↕	
Traffic Volume (vph)	0	0	0	21	1	10	25	889	144	57	1073	6
Future Volume (vph)	0	0	0	21	1	10	25	889	144	57	1073	6
Ideal Flow (vphp)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)					4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor					1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes					1.00	1.00	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes					1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt					1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected					0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)					1800	1800	1615	3600	1800	1700	3600	
Flt Permitted					0.73	1.00	0.16	1.00	1.00	0.21	1.00	
Satd. Flow (perm)					1800	1800	277	3600	1800	1700	3600	
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	0	0	0	26	1	12	31	1098	178	70	1325	7
RTOR Reduction (vph)	0	0	0	0	0	11	0	0	62	0	0	0
Lane Group Flow (vph)	0	0	0	0	27	1	31	1098	116	70	1332	0
Confl. Bikes (#/hr)									2			2
Turn Type				Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1		6
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)					7.4	7.4	40.6	38.6	38.6	43.8	40.2	
Effective Green, g (s)					7.4	7.4	40.6	38.6	38.6	43.8	40.2	
Actuated g/C Ratio					0.11	0.11	0.62	0.59	0.59	0.67	0.62	
Clearance Time (s)					4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Vehicle Extension (s)					3.0	3.0	2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)					204	204	214	2137	1068	1145	2226	
v/s Ratio Prot							c0.00	0.30		0.00	c0.37	
v/s Ratio Perm					0.01	0.00	0.09		0.06	0.04		
v/c Ratio					0.13	0.01	0.14	0.51	0.11	0.06	0.60	
Uniform Delay, d1					25.9	25.5	5.2	7.7	5.7	4.1	7.5	
Progression Factor					1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2					0.3	0.0	0.1	0.9	0.2	0.0	1.2	
Delay (s)					26.2	25.6	5.3	8.6	5.9	4.1	8.7	
Level of Service					C	C	A	A	A	A	A	
Approach Delay (s)		0.0			26.0			8.2			8.5	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	15.4
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	21	1	10	25	889	144	57	1073	6
Future Volume (veh/h)	0	0	0	21	1	10	25	889	144	57	1073	6
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	0	0	26	1	10	31	1098	174	70	1325	7
Adj No. of Lanes	0	1	0	0	1	1	1	2	1	1	2	0
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	135	0	212	6	115	339	2165	948	392	2285	12
Arrive On Green	0.00	0.00	0.00	0.07	0.07	0.07	0.03	0.63	0.63	0.06	0.66	0.66
Sat Flow, veh/h	0	1800	0	1375	81	1530	1619	3420	1498	1619	3488	18
Grp Volume(v), veh/h	0	0	0	27	0	10	31	1098	174	70	650	682
Grp Sat Flow(s),veh/h/ln	0	1800	0	1456	0	1530	1619	1710	1498	1619	1710	1796
Q Serve(g_s), s	0.0	0.0	0.0	1.0	0.0	0.4	0.4	11.3	3.1	0.9	13.7	13.7
Cycle Q Clear(g_c), s	0.0	0.0	0.0	1.1	0.0	0.4	0.4	11.3	3.1	0.9	13.7	13.7
Prop In Lane	0.00		0.00	0.96		1.00	1.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	0	135	0	218	0	115	339	2165	948	392	1120	1177
V/C Ratio(X)	0.00	0.00	0.00	0.12	0.00	0.09	0.09	0.51	0.18	0.18	0.58	0.58
Avail Cap(c_a), veh/h	0	471	0	489	0	400	410	2165	948	472	1120	1177
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	28.3	0.0	28.0	5.0	6.5	5.0	4.5	6.2	6.2
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.3	0.0	0.3	0.0	0.9	0.4	0.1	2.2	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.5	0.0	0.2	0.2	5.4	1.4	0.4	7.0	7.3
LnGrp Delay(d),s/veh	0.0	0.0	0.0	28.6	0.0	28.3	5.0	7.3	5.4	4.6	8.4	8.3
LnGrp LOS				C		C	A	A	A	A	A	A
Approach Vol, veh/h		0			37			1303			1402	
Approach Delay, s/veh		0.0			28.5			7.0			8.2	
Approach LOS					C			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.2	47.3		9.5	6.7	48.8		9.5				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	6.8	25.8		17.0	5.0	27.6		17.0				
Max Q Clear Time (g_c+I1), s	2.9	13.3		0.0	2.4	15.7		3.1				
Green Ext Time (p_c), s	0.0	11.5		0.0	0.0	10.9		0.1				
Intersection Summary												
HCM 2010 Ctrl Delay				7.9								
HCM 2010 LOS				A								

Timings
12: Waterman Av./Waterman Av. & Hospitality Ln.

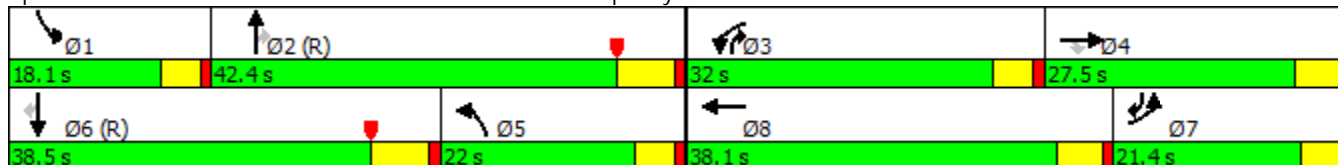


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	195	212	168	498	478	365	1099	1051	133	646	173
Future Volume (vph)	195	212	168	498	478	365	1099	1051	133	646	173
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8	5	2	3	1	6	7
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	3	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	15.1	15.1	9.6	38.1	9.6	36.2	9.6	9.6	36.2	9.6
Total Split (s)	21.4	27.5	27.5	32.0	38.1	22.0	42.4	32.0	18.1	38.5	21.4
Total Split (%)	17.8%	22.9%	22.9%	26.7%	31.8%	18.3%	35.3%	26.7%	15.1%	32.1%	17.8%
Yellow Time (s)	3.6	4.1	4.1	3.6	4.1	3.6	5.2	3.6	3.6	5.2	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	5.1	4.6	5.1	4.6	6.2	4.6	4.6	6.2	4.6
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	17.9	20.6	20.6	24.7	27.4	17.4	41.5	72.4	12.7	36.9	60.9
Actuated g/C Ratio	0.15	0.17	0.17	0.21	0.23	0.14	0.35	0.60	0.11	0.31	0.51
v/c Ratio	0.83	0.45	0.28	0.81	0.79	0.84	0.95	0.49	0.79	0.42	0.19
Control Delay	76.1	43.2	3.8	55.9	48.4	67.4	55.5	9.5	81.9	35.0	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.1	43.2	3.8	55.9	48.4	67.4	55.5	9.5	81.9	35.0	7.4
LOS	E	D	A	E	D	E	E	A	F	C	A
Approach Delay		46.4			51.7		38.0			36.5	
Approach LOS		D			D		D			D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 115
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.95
 Intersection Signal Delay: 41.6
 Intersection LOS: D
 Intersection Capacity Utilization 90.7%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 12: Waterman Av./Waterman Av. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
 12: Waterman Av./Waterman Av. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)

3/27/2017


























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	195	212	168	498	478	145	365	1099	1051	133	646	173
Future Volume (vph)	195	212	168	498	478	145	365	1099	1051	133	646	173
Ideal Flow (vphpl)	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Lane Util. Factor	1.00	0.91	0.91	0.97	0.95		0.97	0.95	0.88	1.00	0.91	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	210	228	181	535	514	156	392	1182	1130	143	695	186
RTOR Reduction (vph)	0	17	104	0	25	0	0	0	169	0	0	64
Lane Group Flow (vph)	210	267	21	535	645	0	392	1182	961	143	695	122
Confl. Peds. (#/hr)							9		1			3
Confl. Bikes (#/hr)							2		3			
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4						2			6
Actuated Green, G (s)	17.9	20.6	20.6	24.7	27.4		17.4	41.5	66.2	12.7	36.8	54.7
Effective Green, g (s)	17.9	20.6	20.6	24.7	27.4		17.4	41.5	66.2	12.7	36.8	54.7
Actuated g/C Ratio	0.15	0.17	0.17	0.21	0.23		0.14	0.35	0.55	0.11	0.31	0.46
Clearance Time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	4.0	2.0	2.0	4.0	2.0
Lane Grp Cap (vph)	253	618	309	658	822		464	1245	1986	179	1656	889
v/s Ratio Prot	c0.12	c0.07		0.17	c0.18		0.12	c0.33	0.10	c0.08	0.13	0.02
v/s Ratio Perm			0.01						0.17			0.05
v/c Ratio	0.83	0.43	0.07	0.81	0.78		0.84	0.95	0.48	0.80	0.42	0.14
Uniform Delay, d1	49.6	44.5	41.7	45.4	43.5		50.0	38.2	16.4	52.4	33.1	19.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	19.3	0.5	0.1	7.2	4.9		12.7	16.0	0.1	20.2	0.8	0.0
Delay (s)	68.8	44.9	41.8	52.7	48.5		62.7	54.2	16.5	72.6	33.9	19.0
Level of Service	E	D	D	D	D		E	D	B	E	C	B
Approach Delay (s)		52.4			50.3			39.7			36.6	
Approach LOS		D			D			D			D	

Intersection Summary

HCM 2000 Control Delay	42.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	90.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	195	212	168	498	478	145	365	1099	1051	133	646	173
Future Volume (veh/h)	195	212	168	498	478	145	365	1099	1051	133	646	173
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	210	228	107	535	514	141	392	1182	698	143	695	88
Adj No. of Lanes	1	2	1	2	2	0	2	2	2	1	3	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	227	641	273	586	613	167	504	1197	1453	167	1323	625
Arrive On Green	0.14	0.18	0.18	0.20	0.23	0.23	0.17	0.35	0.35	0.10	0.27	0.27
Sat Flow, veh/h	1619	3600	1530	2956	2641	720	2956	3420	2627	1619	4914	1525
Grp Volume(v), veh/h	210	228	107	535	332	323	392	1182	698	143	695	88
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	1710	1651	1478	1710	1313	1619	1638	1525
Q Serve(g_s), s	15.4	6.7	5.0	21.3	22.2	22.4	15.2	41.2	19.6	10.4	14.4	0.0
Cycle Q Clear(g_c), s	15.4	6.7	5.0	21.3	22.2	22.4	15.2	41.2	19.6	10.4	14.4	0.0
Prop In Lane	1.00		1.00	1.00		0.44	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	227	641	273	586	397	383	504	1197	1453	167	1323	625
V/C Ratio(X)	0.93	0.36	0.39	0.91	0.84	0.84	0.78	0.99	0.48	0.86	0.53	0.14
Avail Cap(c_a), veh/h	227	672	286	675	470	454	504	1197	1453	182	1323	625
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.55	0.55	0.55	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.0	43.3	20.0	47.1	43.9	44.0	47.6	38.7	16.7	53.0	37.3	22.2
Incr Delay (d2), s/veh	39.5	0.3	0.9	9.0	6.3	7.0	6.9	23.2	1.1	27.7	1.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.4	3.4	2.2	9.4	11.2	11.0	6.7	23.2	7.3	6.0	6.7	1.9
LnGrp Delay(d),s/veh	90.5	43.6	21.0	56.1	50.2	51.0	54.6	61.9	17.8	80.7	38.8	22.7
LnGrp LOS	F	D	C	E	D	D	D	E	B	F	D	C
Approach Vol, veh/h		545			1190			2272			926	
Approach Delay, s/veh		57.2			53.1			47.1			43.8	
Approach LOS		E			D			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.9	48.2	28.4	26.5	26.6	38.5	21.9	33.0				
Change Period (Y+Rc), s	4.6	6.2	4.6	5.1	6.2	* 6.2	5.1	* 5.1				
Max Green Setting (Gmax), s	13.5	36.2	27.4	22.4	17.4	* 32	16.8	* 33				
Max Q Clear Time (g_c+I1), s	12.4	43.2	23.3	8.7	17.2	16.4	17.4	24.4				
Green Ext Time (p_c), s	0.0	0.0	0.5	1.7	0.0	5.5	0.0	2.6				
Intersection Summary												
HCM 2010 Ctrl Delay			49.0									
HCM 2010 LOS			D									
Notes												

Intersection

Int Delay, s/veh 1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↘ ↗	↗	↗↗↗	
Traffic Vol, veh/h	0	0	363	2515	1471	189
Future Vol, veh/h	0	0	363	2515	1471	189
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	0	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	378	2620	1532	197

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	766	1532 0
Stage 1	-	-	- -
Stage 2	-	-	- -
Critical Hdwy	-	7.1	5.3 -
Critical Hdwy Stg 1	-	-	- -
Critical Hdwy Stg 2	-	-	- -
Follow-up Hdwy	-	3.9	3.1 -
Pot Cap-1 Maneuver	0	*594	*747 -
Stage 1	0	-	- -
Stage 2	0	-	- -
Platoon blocked, %	-	1	1 -
Mov Cap-1 Maneuver	-	*594	*747 -
Mov Cap-2 Maneuver	-	-	- -
Stage 1	-	-	- -
Stage 2	-	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	0	1.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	* 747	-	-	-	-
HCM Lane V/C Ratio	0.506	-	-	-	-
HCM Control Delay (s)	14.7	-	0	-	-
HCM Lane LOS	B	-	A	-	-
HCM 95th %tile Q(veh)	2.9	-	-	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations						↗		↕			↕	
Traffic Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Future Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	-	-	-	Free	-	-	-	-	-	None
Storage Length	-	-	-	-	-	0	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	1209	0	998	0	0	746	171

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	0	0	0
Stage 1	0	0	0
Stage 2	0	0	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBTWBLn1	SBT	SBR
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	-	0	-
HCM Lane LOS	-	A	-
HCM 95th %tile Q(veh)	-	-	-

Intersection

Int Delay, s/veh

Movement	NWL	NWR
Lane Configurations		
Traffic Vol, veh/h	0	0
Future Vol, veh/h	0	0
Conflicting Peds, #/hr	0	0
Sign Control	Stop	Stop
RT Channelized	-	-
Storage Length	-	-
Veh in Median Storage, #	0	-
Grade, %	0	-
Peak Hour Factor	95	95
Heavy Vehicles, %	0	0
Mvmt Flow	0	0

Major/Minor

Conflicting Flow All

Stage 1

Stage 2

Critical Hdwy

Critical Hdwy Stg 1

Critical Hdwy Stg 2

Follow-up Hdwy

Pot Cap-1 Maneuver

Stage 1

Stage 2

Platoon blocked, %

Mov Cap-1 Maneuver

Mov Cap-2 Maneuver

Stage 1

Stage 2

Approach

HCM Control Delay, s

HCM LOS

Minor Lane/Major Mvmt

Timings

15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.

3/27/2017

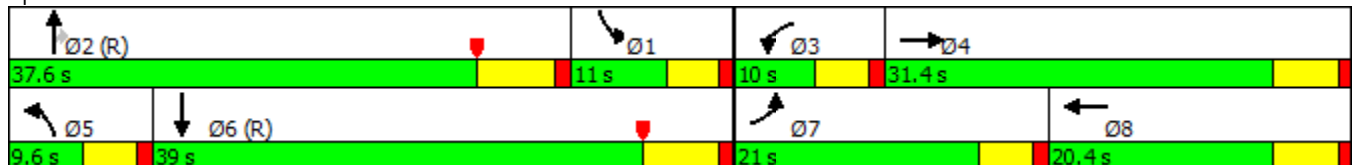


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖↗	↕	↖	↕	↖	↕	↗	↖	↕
Traffic Volume (vph)	629	616	128	272	70	1025	186	302	704
Future Volume (vph)	629	616	128	272	70	1025	186	302	704
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	9.6	31.4	9.6	15.4	9.6	36.2	36.2	9.6	36.2
Total Split (s)	21.0	31.4	10.0	20.4	9.6	37.6	37.6	11.0	39.0
Total Split (%)	23.3%	34.9%	11.1%	22.7%	10.7%	41.8%	41.8%	12.2%	43.3%
Yellow Time (s)	3.6	4.4	3.6	4.4	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	5.4	4.6	6.2	6.2	4.6	6.2
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)	16.4	25.2	5.4	14.2	5.1	32.2	32.2	6.4	35.5
Actuated g/C Ratio	0.18	0.28	0.06	0.16	0.06	0.36	0.36	0.07	0.39
v/c Ratio	1.12	0.88	1.30	0.73	0.76	0.83	0.25	2.62	0.72
Control Delay	111.8	38.7	227.9	33.1	87.2	33.5	3.1	774.9	25.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	111.8	38.7	227.9	33.1	87.2	33.5	3.1	774.9	25.2
LOS	F	D	F	C	F	C	A	F	C
Approach Delay		68.8		74.2		32.0			197.3
Approach LOS		E		E		C			F

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 2.63
 Intersection Signal Delay: 95.3
 Intersection LOS: F
 Intersection Capacity Utilization 102.1%
 ICU Level of Service G
 Analysis Period (min) 15

Splits and Phases: 15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.
























HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 15: Waterman Av./Waterman Av. & Redlands Bl./Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↕		↖	↕		↖	↕	↗	↖	↕	↕
Traffic Volume (vph)	629	616	280	128	272	205	70	1025	186	302	704	311
Future Volume (vph)	629	616	280	128	272	205	70	1025	186	302	704	311
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.94		1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Flt Permitted	1.00	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	655	642	292	133	283	214	73	1068	194	315	733	324
RTOR Reduction (vph)	0	59	0	0	112	0	0	0	127	0	54	0
Lane Group Flow (vph)	655	875	0	133	385	0	73	1068	67	315	1003	0
Confl. Peds. (#/hr)			3						1			4
Confl. Bikes (#/hr)			1						1			
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	16.4	25.2		5.4	14.2		4.0	31.3	31.3	7.3	34.6	
Effective Green, g (s)	16.4	25.2		5.4	14.2		4.0	31.3	31.3	7.3	34.6	
Actuated g/C Ratio	0.18	0.28		0.06	0.16		0.04	0.35	0.35	0.08	0.38	
Clearance Time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	583	1008		102	568		75	1252	626	137	1384	
v/s Ratio Prot	c0.20	c0.24		0.08	0.11		0.04	c0.30		c0.19	0.28	
v/s Ratio Perm									0.04			
v/c Ratio	1.12	0.87		1.30	0.68		0.97	0.85	0.11	2.30	0.72	
Uniform Delay, d1	36.8	30.8		42.3	35.7		42.9	27.2	19.9	41.4	23.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	76.1	8.0		191.0	3.2		93.9	7.5	0.3	607.1	3.3	
Delay (s)	112.9	38.8		233.3	39.0		136.8	34.7	20.2	648.4	27.0	
Level of Service	F	D		F	D		F	C	C	F	C	
Approach Delay (s)		69.4			80.0			38.2			169.6	
Approach LOS		E			E			D			F	

Intersection Summary		
HCM 2000 Control Delay	90.2	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.10	F
Actuated Cycle Length (s)	90.0	Sum of lost time (s)
Intersection Capacity Utilization	102.1%	20.8
Analysis Period (min)	15	ICU Level of Service
		G

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	629	616	280	128	272	205	70	1025	186	302	704	311
Future Volume (veh/h)	629	616	280	128	272	205	70	1025	186	302	704	311
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	655	642	238	133	283	189	73	1068	152	315	733	269
Adj No. of Lanes	2	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	539	702	260	97	331	215	90	1193	527	1046	2345	861
Arrive On Green	0.18	0.29	0.29	0.06	0.17	0.17	0.06	0.35	0.35	0.65	0.96	0.96
Sat Flow, veh/h	2956	2433	901	1619	1991	1291	1619	3420	1509	1619	2451	899
Grp Volume(v), veh/h	655	451	429	133	242	230	73	1068	152	315	511	491
Grp Sat Flow(s),veh/h/ln	1478	1710	1624	1619	1710	1572	1619	1710	1509	1619	1710	1640
Q Serve(g_s), s	16.4	22.9	23.0	5.4	12.4	12.9	4.0	26.6	10.7	7.7	1.7	1.7
Cycle Q Clear(g_c), s	16.4	22.9	23.0	5.4	12.4	12.9	4.0	26.6	10.7	7.7	1.7	1.7
Prop In Lane	1.00		0.55	1.00		0.82	1.00		1.00	1.00		0.55
Lane Grp Cap(c), veh/h	539	493	469	97	284	261	90	1193	527	1046	1636	1569
V/C Ratio(X)	1.22	0.91	0.92	1.37	0.85	0.88	0.81	0.90	0.29	0.30	0.31	0.31
Avail Cap(c_a), veh/h	539	494	469	97	285	262	90	1193	527	1046	1636	1569
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.65	0.65	0.65	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.8	30.9	31.0	42.3	36.4	36.6	42.0	27.7	56.6	7.0	0.1	0.1
Incr Delay (d2), s/veh	108.1	15.6	16.3	218.4	21.0	27.2	38.7	10.5	1.4	0.1	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.7	12.9	12.4	8.3	7.5	7.5	2.8	14.2	4.7	3.4	0.9	0.9
LnGrp Delay(d),s/veh	144.9	46.5	47.3	260.7	57.4	63.8	80.7	38.3	58.0	7.1	0.6	0.6
LnGrp LOS	F	D	D	F	E	E	F	D	E	A	A	A
Approach Vol, veh/h		1535			605			1293			1317	
Approach Delay, s/veh		88.7			104.5			43.0			2.2	
Approach LOS		F			F			D			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	65.9	37.6	10.0	31.4	9.6	93.9	21.0	20.4				
Change Period (Y+Rc), s	6.2	* 6.2	4.6	5.4	4.6	6.2	4.6	5.4				
Max Green Setting (Gmax), s	6.4	* 31	5.4	26.0	5.0	32.8	16.4	15.0				
Max Q Clear Time (g_c+I1), s	9.7	28.6	7.4	25.0	6.0	3.7	18.4	14.9				
Green Ext Time (p_c), s	0.0	2.1	0.0	0.8	0.0	9.9	0.0	0.1				
Intersection Summary												
HCM 2010 Ctrl Delay			54.3									
HCM 2010 LOS			D									
Notes												

Timings
16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

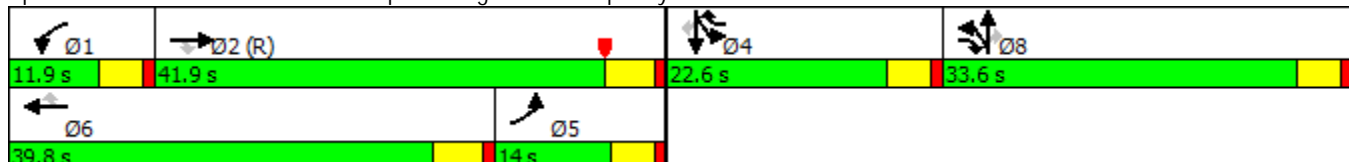


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘↗	↑↑	↗	↘	↑↑	↗	↘	↑↑	↗
Traffic Volume (vph)	128	207	82	60	120	716	430	907	228	9	741	128
Future Volume (vph)	128	207	82	60	120	716	430	907	228	9	741	128
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	8	1	6	4	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	39.1	33.6	9.6	39.1	22.6	33.6	33.6	33.6	22.6	22.6	22.6
Total Split (s)	14.0	41.9	33.6	11.9	39.8	22.6	33.6	33.6	33.6	22.6	22.6	22.6
Total Split (%)	12.7%	38.1%	30.5%	10.8%	36.2%	20.5%	30.5%	30.5%	30.5%	20.5%	20.5%	20.5%
Yellow Time (s)	3.6	4.1	3.6	3.6	4.1	3.6	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	C-Max	Max	None	None	Max	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	28.8	39.7	70.1	6.4	15.3	33.8	29.0	29.0	29.0	18.0	18.0	18.0
Actuated g/C Ratio	0.26	0.36	0.64	0.06	0.14	0.31	0.26	0.26	0.26	0.16	0.16	0.16
v/c Ratio	0.30	0.16	0.07	0.33	0.60	0.77	0.88	1.02	0.39	0.03	1.28	0.30
Control Delay	38.5	25.3	1.2	54.4	13.5	26.3	61.2	75.4	12.9	39.2	178.4	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.5	25.3	1.2	54.4	13.5	26.3	61.2	75.4	12.9	39.2	178.4	5.1
LOS	D	C	A	D	B	C	E	E	B	D	F	A
Approach Delay		24.6			21.3			62.8			151.7	
Approach LOS		C			C			E			F	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:EBT, Start of Yellow
 Natural Cycle: 125
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.28
 Intersection Signal Delay: 69.4
 Intersection LOS: E
 Intersection Capacity Utilization 96.3%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

























Gateway South Building 4 TIA (JN 10187)

3/30/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	128	207	82	60	120	716	430	907	228	9	741	128
Future Volume (vph)	128	207	82	60	120	716	430	907	228	9	741	128
Ideal Flow (vphpl)	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lane Util. Factor	1.00	0.95	1.00	0.97	0.91	0.91	0.91	0.91	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.89	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600	1384	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600	1384	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	131	211	84	61	122	731	439	926	233	9	756	131
RTOR Reduction (vph)	0	0	32	0	318	47	0	0	120	0	0	110
Lane Group Flow (vph)	131	211	52	61	170	318	395	970	113	9	756	21
Confl. Peds. (#/hr)			2			1						
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	29.8	38.7	67.7	5.4	14.3	32.3	29.0	29.0	29.0	18.0	18.0	18.0
Effective Green, g (s)	29.8	38.7	67.7	5.4	14.3	32.3	29.0	29.0	29.0	18.0	18.0	18.0
Actuated g/C Ratio	0.27	0.35	0.62	0.05	0.13	0.29	0.26	0.26	0.26	0.16	0.16	0.16
Clearance Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	460	1266	1107	157	468	406	448	949	474	278	589	294
v/s Ratio Prot	c0.08	0.06	0.01	0.02	0.05	c0.13	0.23	c0.27		0.01	c0.21	
v/s Ratio Perm			0.02			0.10			0.06			0.01
v/c Ratio	0.28	0.17	0.05	0.39	0.36	0.78	0.88	1.02	0.24	0.03	1.28	0.07
Uniform Delay, d1	31.7	24.5	8.4	50.7	43.7	35.7	38.9	40.5	31.8	38.7	46.0	38.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.3	0.1	0.6	0.5	9.6	21.4	34.9	1.2	0.2	140.2	0.5
Delay (s)	31.8	24.8	8.5	51.3	44.2	45.2	60.2	75.4	33.0	38.9	186.2	39.4
Level of Service	C	C	A	D	D	D	E	E	C	D	F	D
Approach Delay (s)		23.7			45.1			65.5			163.2	
Approach LOS		C			D			E			F	

Intersection Summary		
HCM 2000 Control Delay	78.8	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.79	E
Actuated Cycle Length (s)	110.0	Sum of lost time (s)
Intersection Capacity Utilization	96.3%	18.9
Analysis Period (min)	15	ICU Level of Service
		F

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	128	207	82	60	120	716	430	907	228	9	741	128
Future Volume (veh/h)	128	207	82	60	120	716	430	907	228	9	741	128
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	131	211	67	61	122	719	439	926	193	9	756	113
Adj No. of Lanes	1	2	1	2	1	2	1	2	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	261	1240	950	117	424	1219	427	949	403	265	560	250
Arrive On Green	0.16	0.36	0.36	0.04	0.24	0.24	0.26	0.26	0.26	0.16	0.16	0.16
Sat Flow, veh/h	1619	3420	1508	3048	1800	3053	1619	3600	1530	1619	3420	1530
Grp Volume(v), veh/h	131	211	67	61	122	719	439	926	193	9	756	113
Grp Sat Flow(s),veh/h/ln	1619	1710	1508	1524	1800	1527	1619	1800	1530	1619	1710	1530
Q Serve(g_s), s	8.1	4.6	1.9	2.2	6.1	20.4	29.0	28.1	11.7	0.5	18.0	7.3
Cycle Q Clear(g_c), s	8.1	4.6	1.9	2.2	6.1	20.4	29.0	28.1	11.7	0.5	18.0	7.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	261	1240	950	117	424	1219	427	949	403	265	560	250
V/C Ratio(X)	0.50	0.17	0.07	0.52	0.29	0.59	1.03	0.98	0.48	0.03	1.35	0.45
Avail Cap(c_a), veh/h	261	1240	950	202	568	1464	427	949	403	265	560	250
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.85	0.85	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.1	23.8	8.0	51.9	34.5	26.0	40.5	40.2	34.1	38.7	46.0	41.5
Incr Delay (d2), s/veh	0.5	0.3	0.1	1.3	0.4	0.5	51.1	23.9	4.0	0.2	169.4	5.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	2.2	1.4	0.9	3.1	11.0	19.0	17.0	5.4	0.2	21.6	3.5
LnGrp Delay(d),s/veh	42.6	24.1	8.2	53.2	34.9	26.4	91.6	64.0	38.2	38.9	215.4	47.3
LnGrp LOS	D	C	A	D	C	C	F	E	D	D	F	D
Approach Vol, veh/h		409			902			1558			878	
Approach Delay, s/veh		27.4			29.4			68.6			192.0	
Approach LOS		C			C			E			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.8	45.0		22.6	22.8	31.0		33.6				
Change Period (Y+Rc), s	4.6	5.1		4.6	5.1	* 5.1		4.6				
Max Green Setting (Gmax), s	7.3	36.8		18.0	9.4	* 35		29.0				
Max Q Clear Time (g_c+I1), s	4.2	6.6		20.0	10.1	22.4		31.0				
Green Ext Time (p_c), s	0.0	1.6		0.0	0.0	3.1		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			83.6									
HCM 2010 LOS			F									
Notes												

Timings
1: I-215 SB Ramps & Auto Center Rd.

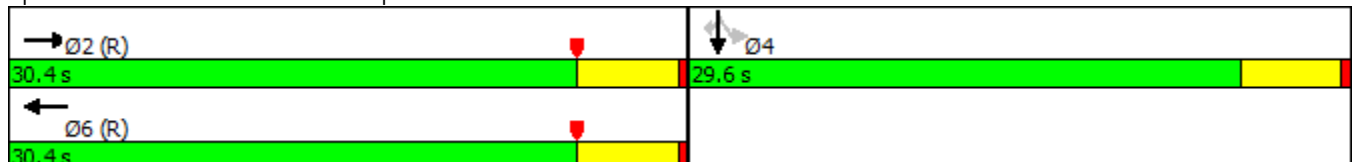


Lane Group	EBT	WBT	SBL	SBT	SBR
Lane Configurations	↑↑	↑↑	↘	↙	↗
Traffic Volume (vph)	457	526	861	91	178
Future Volume (vph)	457	526	861	91	178
Turn Type	NA	NA	Perm	NA	Perm
Protected Phases	2	6		4	
Permitted Phases			4		4
Detector Phase	2	6	4	4	4
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	30.0	22.5	22.5	22.5	22.5
Total Split (s)	30.4	30.4	29.6	29.6	29.6
Total Split (%)	50.7%	50.7%	49.3%	49.3%	49.3%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	Max	Max	Max
Act Effct Green (s)	25.4	25.4	24.6	24.6	24.6
Actuated g/C Ratio	0.42	0.42	0.41	0.41	0.41
v/c Ratio	0.45	0.36	0.71	0.68	0.22
Control Delay	9.3	6.7	21.7	20.1	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	9.3	6.7	21.7	20.1	2.9
LOS	A	A	C	C	A
Approach Delay	9.3	6.7		18.0	
Approach LOS	A	A		B	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 50 (83%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 12.9
 Intersection LOS: B
 Intersection Capacity Utilization 58.1%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 1: I-215 SB Ramps & Auto Center Rd.



HCM Signalized Intersection Capacity Analysis
1: I-215 SB Ramps & Auto Center Rd.

Gateway South Building 4 TIA (JN 10187)


















3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑					↘	↙	↗
Traffic Volume (vph)	0	457	257	0	526	0	0	0	0	861	91	178
Future Volume (vph)	0	457	257	0	526	0	0	0	0	861	91	178
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		5.0			5.0					5.0	5.0	5.0
Lane Util. Factor		0.95			0.95					0.95	0.95	1.00
Frbp, ped/bikes		0.99			1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00			1.00					1.00	1.00	1.00
Frt		0.95			1.00					1.00	1.00	0.85
Flt Protected		1.00			1.00					0.95	0.96	1.00
Satd. Flow (prot)		3600			3600					1700	1800	1800
Flt Permitted		1.00			1.00					0.95	0.96	1.00
Satd. Flow (perm)		3600			3600					1700	1800	1800
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	476	268	0	548	0	0	0	0	897	95	185
RTOR Reduction (vph)	0	130	0	0	0	0	0	0	0	0	0	109
Lane Group Flow (vph)	0	614	0	0	548	0	0	0	0	493	499	76
Confl. Peds. (#/hr)			1									
Confl. Bikes (#/hr)			1									
Turn Type		NA			NA					Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases										4		4
Actuated Green, G (s)		25.4			25.4					24.6	24.6	24.6
Effective Green, g (s)		25.4			25.4					24.6	24.6	24.6
Actuated g/C Ratio		0.42			0.42					0.41	0.41	0.41
Clearance Time (s)		5.0			5.0					5.0	5.0	5.0
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1524			1524					697	738	738
v/s Ratio Prot		c0.17			0.15							
v/s Ratio Perm										c0.29	0.28	0.04
v/c Ratio		0.40			0.36					0.71	0.68	0.10
Uniform Delay, d1		12.0			11.8					14.7	14.4	10.9
Progression Factor		1.00			0.55					1.00	1.00	1.00
Incremental Delay, d2		0.8			0.2					6.0	4.9	0.3
Delay (s)		12.8			6.6					20.7	19.4	11.2
Level of Service		B			A					C	B	B
Approach Delay (s)		12.8			6.6			0.0			18.6	
Approach LOS		B			A			A			B	

Intersection Summary		
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service B
HCM 2000 Volume to Capacity ratio	0.55	
Actuated Cycle Length (s)	60.0	Sum of lost time (s) 10.0
Intersection Capacity Utilization	58.1%	ICU Level of Service B
Analysis Period (min)	15	

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	457	257	0	526	0	0	0	0	861	91	178
Future Volume (veh/h)	0	457	257	0	526	0	0	0	0	861	91	178
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	0	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	476	217	0	548	0				965	0	64
Adj No. of Lanes	0	2	0	0	2	0				2	0	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	962	435	0	1448	0				1328	0	627
Arrive On Green	0.00	0.42	0.42	0.00	0.85	0.00				0.41	0.00	0.41
Sat Flow, veh/h	0	2363	1029	0	3600	0				3238	0	1530
Grp Volume(v), veh/h	0	357	336	0	548	0				965	0	64
Grp Sat Flow(s),veh/h/ln	0	1710	1591	0	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	9.1	9.3	0.0	2.2	0.0				15.0	0.0	1.5
Cycle Q Clear(g_c), s	0.0	9.1	9.3	0.0	2.2	0.0				15.0	0.0	1.5
Prop In Lane	0.00		0.65	0.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	724	674	0	1448	0				1328	0	627
V/C Ratio(X)	0.00	0.49	0.50	0.00	0.38	0.00				0.73	0.00	0.10
Avail Cap(c_a), veh/h	0	724	674	0	1448	0				1328	0	627
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	12.6	12.6	0.0	2.8	0.0				14.9	0.0	10.9
Incr Delay (d2), s/veh	0.0	2.4	2.6	0.0	0.8	0.0				3.5	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.7	4.5	0.0	1.1	0.0				7.3	0.0	0.7
LnGrp Delay(d),s/veh	0.0	15.0	15.3	0.0	3.6	0.0				18.4	0.0	11.2
LnGrp LOS		B	B		A					B		B
Approach Vol, veh/h		693			548						1029	
Approach Delay, s/veh		15.1			3.6						17.9	
Approach LOS		B			A						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		30.4		29.6		30.4						
Change Period (Y+Rc), s		5.0		5.0		5.0						
Max Green Setting (Gmax), s		25.4		24.6		25.4						
Max Q Clear Time (g_c+I1), s		11.3		17.0		4.2						
Green Ext Time (p_c), s		6.5		2.6		8.0						
Intersection Summary												
HCM 2010 Ctrl Delay			13.6									
HCM 2010 LOS			B									
Notes												

Timings

2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations	↙	↑↑	↑↑	↘	↙	↑	↘↘
Traffic Volume (vph)	198	1120	1518	828	105	93	763
Future Volume (vph)	198	1120	1518	828	105	93	763
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm
Protected Phases	5	2	6		8	8	
Permitted Phases				6			8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	8.0	8.0	8.0	5.0	5.0	5.0
Minimum Split (s)	8.5	39.0	13.0	13.0	10.0	10.0	10.0
Total Split (s)	9.8	39.0	29.2	29.2	21.0	21.0	21.0
Total Split (%)	16.3%	65.0%	48.7%	48.7%	35.0%	35.0%	35.0%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max
Act Effct Green (s)	6.3	34.0	24.2	24.2	16.0	16.0	16.0
Actuated g/C Ratio	0.10	0.57	0.40	0.40	0.27	0.27	0.27
v/c Ratio	1.13	0.56	1.07	0.82	0.21	0.22	0.74
Control Delay	132.2	5.3	55.0	9.7	18.7	18.7	21.6
Queue Delay	0.0	0.1	0.0	0.5	0.0	0.0	0.1
Total Delay	132.2	5.4	55.0	10.1	18.7	18.7	21.7
LOS	F	A	D	B	B	B	C
Approach Delay		24.4	39.1			21.1	
Approach LOS		C	D			C	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 43 (72%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.13
 Intersection Signal Delay: 31.2
 Intersection LOS: C
 Intersection Capacity Utilization 83.7%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017






















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↗	↗↗			
Traffic Volume (vph)	198	1120	0	0	1518	828	105	93	763	0	0	0
Future Volume (vph)	198	1120	0	0	1518	828	105	93	763	0	0	0
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800	1700	1800	1800	1800	1800	1800
Total Lost time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	0.88			
Frbp, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	1700	3600			3600	1800	1700	1800	3600			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	1700	3600			3600	1800	1700	1800	3600			
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	202	1143	0	0	1549	845	107	95	779	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	311	0	0	95	0	0	0
Lane Group Flow (vph)	202	1143	0	0	1549	534	96	106	684	0	0	0
Confl. Peds. (#/hr)			1									
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	6.3	34.0			24.2	24.2	16.0	16.0	16.0			
Effective Green, g (s)	6.3	34.0			24.2	24.2	16.0	16.0	16.0			
Actuated g/C Ratio	0.10	0.57			0.40	0.40	0.27	0.27	0.27			
Clearance Time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Vehicle Extension (s)	2.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	178	2040			1452	726	453	480	960			
v/s Ratio Prot	c0.12	0.32			c0.43		0.06	0.06				
v/s Ratio Perm						0.30			c0.19			
v/c Ratio	1.13	0.56			1.07	0.74	0.21	0.22	0.71			
Uniform Delay, d1	26.9	8.3			17.9	15.2	17.1	17.1	19.9			
Progression Factor	0.98	0.52			0.97	1.20	1.00	1.00	1.00			
Incremental Delay, d2	101.2	0.9			35.5	2.2	1.1	1.1	4.5			
Delay (s)	127.6	5.2			52.8	20.4	18.2	18.2	24.4			
Level of Service	F	A			D	C	B	B	C			
Approach Delay (s)		23.6			41.4			23.1			0.0	
Approach LOS		C			D			C			A	

Intersection Summary

HCM 2000 Control Delay	32.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	83.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	198	1120	0	0	1518	828	105	93	763	0	0	0
Future Volume (veh/h)	198	1120	0	0	1518	828	105	93	763	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1700	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	202	1143	0	0	1549	641	101	103	445			
Adj No. of Lanes	1	2	0	0	2	1	1	1	2			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	170	1938	0	0	1379	617	432	480	816			
Arrive On Green	0.11	0.57	0.00	0.00	0.27	0.27	0.27	0.27	0.27			
Sat Flow, veh/h	1619	3510	0	0	3510	1530	1619	1800	3060			
Grp Volume(v), veh/h	202	1143	0	0	1549	641	101	103	445			
Grp Sat Flow(s),veh/h/ln	1619	1710	0	0	1710	1530	1619	1800	1530			
Q Serve(g_s), s	6.3	13.1	0.0	0.0	24.2	24.2	2.9	2.7	7.5			
Cycle Q Clear(g_c), s	6.3	13.1	0.0	0.0	24.2	24.2	2.9	2.7	7.5			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	170	1938	0	0	1379	617	432	480	816			
V/C Ratio(X)	1.19	0.59	0.00	0.00	1.12	1.04	0.23	0.21	0.55			
Avail Cap(c_a), veh/h	170	1938	0	0	1379	617	432	480	816			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	0.67	0.67	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.09	0.09	1.00	1.00	1.00			
Uniform Delay (d), s/veh	26.9	8.5	0.0	0.0	21.9	21.9	17.2	17.1	18.9			
Incr Delay (d2), s/veh	128.7	1.3	0.0	0.0	56.4	22.8	1.3	1.0	2.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	8.9	6.4	0.0	0.0	22.2	14.1	1.4	1.5	3.4			
LnGrp Delay(d),s/veh	155.5	9.8	0.0	0.0	78.3	44.7	18.5	18.1	21.5			
LnGrp LOS	F	A			F	F	B	B	C			
Approach Vol, veh/h		1345			2190			649				
Approach Delay, s/veh		31.7			68.4			20.5				
Approach LOS		C			E			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		39.0			9.8	29.2		21.0				
Change Period (Y+Rc), s		5.0			3.5	5.0		5.0				
Max Green Setting (Gmax), s		34.0			6.3	24.2		16.0				
Max Q Clear Time (g_c+I1), s		15.1			8.3	26.2		9.5				
Green Ext Time (p_c), s		17.2			0.0	0.0		1.5				
Intersection Summary												
HCM 2010 Ctrl Delay				49.2								
HCM 2010 LOS				D								
Notes												

Timings
3: E St. & Orange Show Rd.



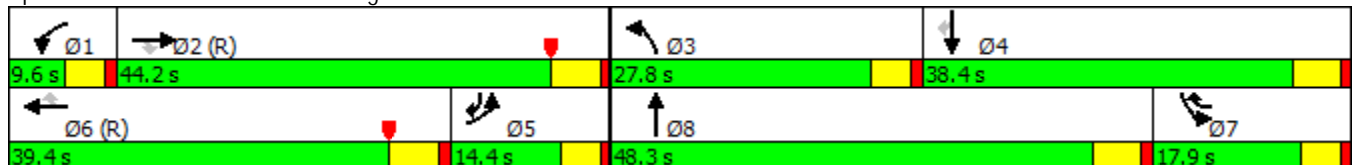
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑	↗	↔↔	↑↑	↗	↗	↑↔	↔↔	↑↑	↗
Traffic Volume (vph)	318	1043	434	251	1155	198	402	483	189	389	437
Future Volume (vph)	318	1043	434	251	1155	198	402	483	189	389	437
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8	7	4	5
Permitted Phases			2			6					4
Detector Phase	5	2	2	1	6	7	3	8	7	4	5
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0
Minimum Split (s)	9.6	39.4	39.4	9.6	39.4	9.6	9.6	38.4	9.6	38.4	9.6
Total Split (s)	14.4	44.2	44.2	9.6	39.4	17.9	27.8	48.3	17.9	38.4	14.4
Total Split (%)	12.0%	36.8%	36.8%	8.0%	32.8%	14.9%	23.2%	40.3%	14.9%	32.0%	12.0%
Yellow Time (s)	3.6	4.4	4.4	3.6	4.4	3.6	3.6	4.4	3.6	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4	4.6	5.4	4.6
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	Max	None	Max	None
Act Effct Green (s)	9.8	38.8	38.8	5.0	34.0	52.7	23.2	42.9	13.3	33.0	43.6
Actuated g/C Ratio	0.08	0.32	0.32	0.04	0.28	0.44	0.19	0.36	0.11	0.28	0.36
v/c Ratio	1.27	0.93	0.54	1.96	1.18	0.24	1.36	0.51	0.56	0.41	0.63
Control Delay	186.9	53.2	10.1	480.2	141.0	27.8	217.9	29.9	57.1	37.1	19.5
Queue Delay	0.0	2.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	186.9	56.1	10.4	480.2	141.0	27.8	217.9	29.9	57.1	37.1	19.5
LOS	F	E	B	F	F	C	F	C	E	D	B
Approach Delay		68.2			180.1			102.0		33.2	
Approach LOS		E			F			F		C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 108 (90%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.96
 Intersection Signal Delay: 101.0
 Intersection Capacity Utilization 115.1%
 Analysis Period (min) 15

Intersection LOS: F
 ICU Level of Service H































Splits and Phases: 3: E St. & Orange Show Rd.



























HCM Signalized Intersection Capacity Analysis
3: E St. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 			 		 	 	
Traffic Volume (vph)	318	1043	434	251	1155	198	402	483	163	189	389	437
Future Volume (vph)	318	1043	434	251	1155	198	402	483	163	189	389	437
Ideal Flow (vphp)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Total Lost time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95		0.97	0.95	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3200	3600	1800	3200	3600	1800	1600	3600		3200	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3200	3600	1800	3200	3600	1800	1600	3600		3200	3600	1800
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	331	1086	452	261	1203	206	419	503	170	197	405	455
RTOR Reduction (vph)	0	0	261	0	0	68	0	28	0	0	0	68
Lane Group Flow (vph)	331	1086	191	261	1203	138	419	645	0	197	405	387
Confl. Peds. (#/hr)									2			2
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	9.8	38.8	38.8	5.0	34.0	47.3	23.2	42.9		13.3	33.0	42.8
Effective Green, g (s)	9.8	38.8	38.8	5.0	34.0	47.3	23.2	42.9		13.3	33.0	42.8
Actuated g/C Ratio	0.08	0.32	0.32	0.04	0.28	0.39	0.19	0.36		0.11	0.28	0.36
Clearance Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	2.0	2.0	3.0		2.0	3.0	2.0
Lane Grp Cap (vph)	261	1164	582	133	1020	778	309	1287		354	990	642
v/s Ratio Prot	c0.10	0.30		c0.08	c0.33	0.02	c0.26	0.18		0.06	0.11	c0.05
v/s Ratio Perm			0.11			0.06						0.17
v/c Ratio	1.27	0.93	0.33	1.96	1.18	0.18	1.36	0.50		0.56	0.41	0.60
Uniform Delay, d1	55.1	39.3	30.7	57.5	43.0	23.7	48.4	30.2		50.6	35.5	31.6
Progression Factor	1.02	1.04	1.44	1.17	1.52	2.89	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	142.1	11.9	1.2	447.7	86.7	0.0	179.9	1.4		1.1	1.3	1.1
Delay (s)	198.1	52.9	45.4	515.0	151.9	68.5	228.3	31.6		51.6	36.8	32.7
Level of Service	F	D	D	F	F	E	F	C		D	D	C
Approach Delay (s)		76.8			198.3			107.1			37.8	
Approach LOS		E			F			F			D	
Intersection Summary												
HCM 2000 Control Delay			111.0			HCM 2000 Level of Service			F			
HCM 2000 Volume to Capacity ratio			1.05									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			115.1%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	318	1043	434	251	1155	198	402	483	163	189	389	437
Future Volume (veh/h)	318	1043	434	251	1155	198	402	483	163	189	389	437
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	331	1086	276	261	1203	150	419	503	139	197	405	348
Adj No. of Lanes	2	2	1	2	2	1	1	2	0	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	867	1852	829	123	969	593	295	948	261	308	940	869
Arrive On Green	0.59	1.00	1.00	0.01	0.09	0.09	0.19	0.36	0.36	0.10	0.28	0.28
Sat Flow, veh/h	2956	3420	1530	2956	3420	1530	1524	2651	729	2956	3420	1527
Grp Volume(v), veh/h	331	1086	276	261	1203	150	419	323	319	197	405	348
Grp Sat Flow(s),veh/h/ln	1478	1710	1530	1478	1710	1530	1524	1710	1670	1478	1710	1527
Q Serve(g_s), s	7.2	0.0	0.0	5.0	34.0	0.0	23.2	18.0	18.2	7.7	11.7	8.2
Cycle Q Clear(g_c), s	7.2	0.0	0.0	5.0	34.0	0.0	23.2	18.0	18.2	7.7	11.7	8.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.44	1.00		1.00
Lane Grp Cap(c), veh/h	867	1852	829	123	969	593	295	611	597	308	941	869
V/C Ratio(X)	0.38	0.59	0.33	2.12	1.24	0.25	1.42	0.53	0.53	0.64	0.43	0.40
Avail Cap(c_a), veh/h	867	1852	829	123	969	593	295	611	597	328	941	869
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.73	0.73	0.73	0.36	0.36	0.36	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.0	0.0	0.0	59.2	54.4	32.5	48.4	30.5	30.6	51.6	35.8	12.5
Incr Delay (d2), s/veh	0.1	1.0	0.8	513.2	112.0	0.4	208.7	3.3	3.4	2.7	1.4	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.3	0.2	10.8	31.2	4.4	26.8	9.0	9.0	3.3	5.7	5.2
LnGrp Delay(d),s/veh	19.1	1.0	0.8	572.4	166.4	32.9	257.1	33.8	34.0	54.3	37.2	13.9
LnGrp LOS	B	A	A	F	F	C	F	C	C	D	D	B
Approach Vol, veh/h		1693			1614			1061			950	
Approach Delay, s/veh		4.5			219.6			122.1			32.2	
Approach LOS		A			F			F			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.6	70.7	27.8	38.4	40.9	39.4	17.9	48.3				
Change Period (Y+Rc), s	4.6	5.4	4.6	5.4	5.4	* 5.4	5.4	* 5.4				
Max Green Setting (Gmax), s	5.0	38.8	23.2	33.0	9.8	* 34	13.3	* 43				
Max Q Clear Time (g_c+I1), s	7.0	2.0	25.2	13.7	9.2	36.0	9.7	20.2				
Green Ext Time (p_c), s	0.0	16.5	0.0	3.9	0.1	0.0	1.5	3.8				
Intersection Summary												
HCM 2010 Ctrl Delay			98.2									
HCM 2010 LOS			F									
Notes												

Timings

4: Arrowhead Av. & Orange Show Rd.

3/27/2017

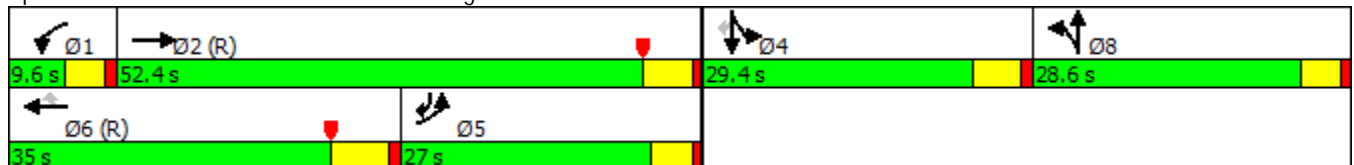


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	316	1030	13	883	182	26	19	276	15	535
Future Volume (vph)	316	1030	13	883	182	26	19	276	15	535
Turn Type	Prot	NA	Prot	NA	Perm	Split	NA	Split	NA	pm+ov
Protected Phases	5	2	1	6		8	8	4	4	5
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	8	8	4	4	5
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	28.4	9.6	29.2	29.2	28.6	28.6	29.4	29.4	9.6
Total Split (s)	27.0	52.4	9.6	35.0	35.0	28.6	28.6	29.4	29.4	27.0
Total Split (%)	22.5%	43.7%	8.0%	29.2%	29.2%	23.8%	23.8%	24.5%	24.5%	22.5%
Yellow Time (s)	3.6	4.4	3.6	5.2	5.2	3.6	3.6	4.4	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	6.2	6.2	4.6	4.6	5.4	5.4	4.6
Lead/Lag	Lag	Lag	Lead	Lead	Lead					Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	C-Max	None	C-Max	C-Max	Max	Max	Max	Max	None
Act Effect Green (s)	22.4	52.8	5.0	28.8	28.8	24.0	24.0	24.0	24.0	51.8
Actuated g/C Ratio	0.19	0.44	0.04	0.24	0.24	0.20	0.20	0.20	0.20	0.43
v/c Ratio	1.07	0.71	0.20	1.10	0.35	0.08	0.11	0.46	0.43	0.56
Control Delay	89.0	16.0	62.4	103.9	9.7	40.0	23.8	47.4	46.4	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.0	16.0	62.4	103.9	9.7	40.0	23.8	47.4	46.4	7.3
LOS	F	B	E	F	A	D	C	D	D	A
Approach Delay		33.0		87.4			30.3		21.3	
Approach LOS		C		F			C		C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 111.2 (93%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.10
 Intersection Signal Delay: 47.7
 Intersection LOS: D
 Intersection Capacity Utilization 95.7%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 4: Arrowhead Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
4: Arrowhead Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)























3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	316	1030	12	13	883	182	26	19	20	276	15	535
Future Volume (vph)	316	1030	12	13	883	182	26	19	20	276	15	535
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	6.2	6.2	4.6	4.6		5.4	5.4	4.6
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		0.95	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	0.98		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00
Satd. Flow (prot)	1700	3600		1700	3600	1800	1700	1800		1700	1800	1800
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00
Satd. Flow (perm)	1700	3600		1700	3600	1800	1700	1800		1700	1800	1800
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	340	1108	13	14	949	196	28	20	22	297	16	575
RTOR Reduction (vph)	0	1	0	0	0	134	0	18	0	0	0	270
Lane Group Flow (vph)	340	1120	0	14	949	62	28	24	0	157	156	305
Confl. Peds. (#/hr)									15			23
Confl. Bikes (#/hr)												1
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		8	8		4	4	5
Permitted Phases						6						4
Actuated Green, G (s)	25.2	50.0		2.0	26.0	26.0	24.0	24.0		24.0	24.0	49.2
Effective Green, g (s)	25.2	50.0		2.0	26.0	26.0	24.0	24.0		24.0	24.0	49.2
Actuated g/C Ratio	0.21	0.42		0.02	0.22	0.22	0.20	0.20		0.20	0.20	0.41
Clearance Time (s)	4.6	5.4		4.6	6.2	6.2	4.6	4.6		5.4	5.4	4.6
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	3.0	3.0		3.0	3.0	2.0
Lane Grp Cap (vph)	357	1500		28	780	390	340	360		340	360	807
v/s Ratio Prot	c0.20	0.31		0.01	c0.26		c0.02	0.01		c0.09	0.09	0.08
v/s Ratio Perm						0.03						0.09
v/c Ratio	0.95	0.75		0.50	1.22	0.16	0.08	0.07		0.46	0.43	0.38
Uniform Delay, d1	46.8	29.6		58.5	47.0	38.1	39.0	38.9		42.3	42.0	24.7
Progression Factor	0.60	0.51		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	23.4	1.9		5.0	109.1	0.9	0.5	0.4		4.5	3.8	0.1
Delay (s)	51.4	16.9		63.5	156.1	39.0	39.5	39.3		46.8	45.8	24.8
Level of Service	D	B		E	F	D	D	D		D	D	C
Approach Delay (s)		25.0			135.2			39.4			32.4	
Approach LOS		C			F			D			C	

Intersection Summary		
HCM 2000 Control Delay	62.8	HCM 2000 Level of Service E
HCM 2000 Volume to Capacity ratio	0.69	
Actuated Cycle Length (s)	120.0	Sum of lost time (s) 20.8
Intersection Capacity Utilization	95.7%	ICU Level of Service F
Analysis Period (min)	15	

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	316	1030	12	13	883	182	26	19	20	276	15	535
Future Volume (veh/h)	316	1030	12	13	883	182	26	19	20	276	15	535
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	340	1108	13	14	949	144	28	20	7	308	0	506
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	448	1780	21	25	821	367	324	253	89	648	0	715
Arrive On Green	0.55	1.00	1.00	0.02	0.24	0.24	0.20	0.20	0.20	0.20	0.00	0.20
Sat Flow, veh/h	1619	3462	41	1619	3420	1530	1619	1266	443	3238	0	1458
Grp Volume(v), veh/h	340	547	574	14	949	144	28	0	27	308	0	506
Grp Sat Flow(s),veh/h/ln	1619	1710	1793	1619	1710	1530	1619	0	1710	1619	0	1458
Q Serve(g_s), s	19.4	0.0	0.0	1.0	28.8	9.5	1.7	0.0	1.5	10.1	0.0	0.0
Cycle Q Clear(g_c), s	19.4	0.0	0.0	1.0	28.8	9.5	1.7	0.0	1.5	10.1	0.0	0.0
Prop In Lane	1.00		0.02	1.00		1.00	1.00		0.26	1.00		1.00
Lane Grp Cap(c), veh/h	448	879	922	25	821	367	324	0	342	648	0	715
V/C Ratio(X)	0.76	0.62	0.62	0.56	1.16	0.39	0.09	0.00	0.08	0.48	0.00	0.71
Avail Cap(c_a), veh/h	448	879	922	67	821	367	324	0	342	648	0	715
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.36	0.36	0.36	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.8	0.0	0.0	58.7	45.6	38.3	39.1	0.0	39.0	42.4	0.0	24.6
Incr Delay (d2), s/veh	2.5	1.2	1.2	7.0	83.9	3.1	0.5	0.0	0.5	2.5	0.0	5.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.8	0.3	0.3	0.5	23.1	4.3	0.8	0.0	0.8	4.7	0.0	14.2
LnGrp Delay(d),s/veh	26.3	1.2	1.2	65.6	129.5	41.4	39.6	0.0	39.5	44.9	0.0	30.4
LnGrp LOS	C	A	A	E	F	D	D		D	D		C
Approach Vol, veh/h		1461			1107			55			814	
Approach Delay, s/veh		7.0			117.2			39.5			35.9	
Approach LOS		A			F			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.5	67.1		29.4	38.6	35.0		28.6				
Change Period (Y+Rc), s	4.6	5.4		5.4	5.4	* 6.2		4.6				
Max Green Setting (Gmax), s	5.0	47.0		24.0	22.4	* 29		24.0				
Max Q Clear Time (g_c+I1), s	3.0	2.0		12.1	21.4	30.8		3.7				
Green Ext Time (p_c), s	0.0	13.8		2.6	0.2	0.0		0.1				
Intersection Summary												
HCM 2010 Ctrl Delay				49.9								
HCM 2010 LOS				D								
Notes												

Timings

5: Washington Av./Washington Av. & Orange Show Rd.

3/27/2017

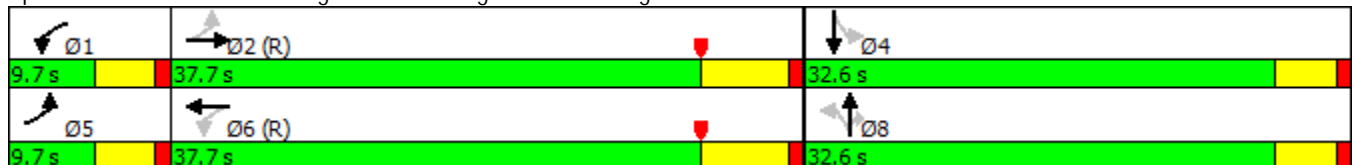


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↖	↗		↖	↗		↕
Traffic Volume (vph)	39	1546	5	1106	62	5	9	11	2
Future Volume (vph)	39	1546	5	1106	62	5	9	11	2
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	Perm	NA
Protected Phases	5	2	1	6		8			4
Permitted Phases	2		6		8		8	4	
Detector Phase	5	2	1	6	8	8	8	4	4
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	9.6	23.2	32.6	32.6	32.6	32.6	32.6
Total Split (s)	9.7	37.7	9.7	37.7	32.6	32.6	32.6	32.6	32.6
Total Split (%)	12.1%	47.1%	12.1%	47.1%	40.8%	40.8%	40.8%	40.8%	40.8%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6	4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None
Act Effect Green (s)	60.1	57.8	59.1	53.9		13.6	13.6		13.6
Actuated g/C Ratio	0.75	0.72	0.74	0.67		0.17	0.17		0.17
v/c Ratio	0.03	0.67	0.00	0.51		0.24	0.03		0.09
Control Delay	5.4	13.1	6.2	12.0		28.4	0.1		16.1
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Delay	5.4	13.1	6.2	12.0		28.4	0.1		16.1
LOS	A	B	A	B		C	A		B
Approach Delay		12.9		12.0		25.0			16.1
Approach LOS		B		B		C			B

Intersection Summary

Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.67
 Intersection Signal Delay: 12.9
 Intersection LOS: B
 Intersection Capacity Utilization 75.7%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 5: Washington Av./Washington Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 5: Washington Av./Washington Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017






















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↖	↗		↕	
Traffic Volume (vph)	39	1546	33	5	1106	17	62	5	9	11	2	14
Future Volume (vph)	39	1546	33	5	1106	17	62	5	9	11	2	14
Ideal Flow (vphp)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2		4.6	6.2			4.6	4.6		4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85		0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.98	
Satd. Flow (prot)	1700	3600		1700	3600			1800	1800		1800	
Flt Permitted	0.17	1.00		0.08	1.00			0.72	1.00		0.88	
Satd. Flow (perm)	1700	3600		1700	3600			1800	1800		1800	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	43	1699	36	5	1215	19	68	5	10	12	2	15
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	9	0	13	0
Lane Group Flow (vph)	43	1734	0	5	1233	0	0	73	1	0	16	0
Confl. Bikes (#/hr)			1									1
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)	55.1	52.0		50.9	49.9			11.6	11.6		11.6	
Effective Green, g (s)	55.1	52.0		50.9	49.9			11.6	11.6		11.6	
Actuated g/C Ratio	0.69	0.65		0.64	0.62			0.14	0.14		0.14	
Clearance Time (s)	4.6	6.2		4.6	6.2			4.6	4.6		4.6	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	1170	2340		1081	2245			261	261		261	
v/s Ratio Prot	c0.00	c0.48		0.00	0.34							
v/s Ratio Perm	0.02			0.00				0.04	0.00		0.01	
v/c Ratio	0.04	0.74		0.00	0.55			0.28	0.01		0.06	
Uniform Delay, d1	5.0	9.5		7.9	8.6			30.5	29.3		29.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.0	2.2		0.0	1.0			0.6	0.0		0.1	
Delay (s)	5.0	11.6		7.9	9.6			31.1	29.3		29.6	
Level of Service	A	B		A	A			C	C		C	
Approach Delay (s)		11.5			9.6			30.8			29.6	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.4
Intersection Capacity Utilization	75.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary
 5: Washington Av./Washington Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	1546	33	5	1106	17	62	5	9	11	2	14
Future Volume (veh/h)	39	1546	33	5	1106	17	62	5	9	11	2	14
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	43	1699	36	5	1215	19	68	5	9	12	2	5
Adj No. of Lanes	1	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	356	2359	50	203	2265	35	245	15	171	141	29	35
Arrive On Green	0.04	0.69	0.69	0.01	0.66	0.66	0.11	0.11	0.11	0.11	0.11	0.11
Sat Flow, veh/h	1619	3423	72	1619	3447	54	1414	134	1530	605	264	310
Grp Volume(v), veh/h	43	847	888	5	603	631	73	0	9	19	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1785	1619	1710	1790	1548	0	1530	1179	0	0
Q Serve(g_s), s	0.7	24.4	24.6	0.1	14.9	14.9	0.0	0.0	0.4	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.7	24.4	24.6	0.1	14.9	14.9	3.1	0.0	0.4	3.2	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.03	0.93		1.00	0.63		0.26
Lane Grp Cap(c), veh/h	356	1178	1230	203	1124	1177	260	0	171	205	0	0
V/C Ratio(X)	0.12	0.72	0.72	0.02	0.54	0.54	0.28	0.00	0.05	0.09	0.00	0.00
Avail Cap(c_a), veh/h	397	1178	1230	295	1124	1177	606	0	535	557	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.09	0.09	0.09	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	5.4	7.7	7.7	7.6	7.3	7.3	33.0	0.0	31.7	31.9	0.0	0.0
Incr Delay (d2), s/veh	0.1	3.8	3.7	0.0	0.2	0.2	0.6	0.0	0.1	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	12.5	13.1	0.0	6.9	7.2	1.5	0.0	0.2	0.4	0.0	0.0
LnGrp Delay(d),s/veh	5.4	11.4	11.4	7.6	7.4	7.4	33.5	0.0	31.9	32.1	0.0	0.0
LnGrp LOS	A	B	B	A	A	A	C		C	C		
Approach Vol, veh/h		1778			1239			82			19	
Approach Delay, s/veh		11.3			7.4			33.4			32.1	
Approach LOS		B			A			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.1	61.3		13.5	7.7	58.8		13.5				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.1	31.5		28.0	5.1	31.5		28.0				
Max Q Clear Time (g_c+I1), s	2.1	26.6		5.2	2.7	16.9		5.1				
Green Ext Time (p_c), s	0.0	4.8		0.5	0.0	13.9		0.5				
Intersection Summary												
HCM 2010 Ctrl Delay				10.4								
HCM 2010 LOS				B								

Intersection

Int Delay, s/veh 3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↔	
Traffic Vol, veh/h	0	0	0	0	0	33	0	0	0	23	0	0
Future Vol, veh/h	0	0	0	0	0	33	0	0	0	23	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	54	54	54	54	54	54	54	54	54	54	54	54
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	61	0	0	0	43	0	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	61	0	31
Stage 1	-	-	31
Stage 2	-	-	0
Critical Hdwy	4.1	-	6.4
Critical Hdwy Stg 1	-	-	5.4
Critical Hdwy Stg 2	-	-	5.4
Follow-up Hdwy	2.2	-	3.5
Pot Cap-1 Maneuver	1555	0	988
Stage 1	-	0	997
Stage 2	-	0	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1555	-	988
Mov Cap-2 Maneuver	-	-	988
Stage 1	-	-	997
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1555	-	-	-	988
HCM Lane V/C Ratio	-	-	-	-	0.043
HCM Control Delay (s)	0	-	-	-	8.8
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Timings

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.

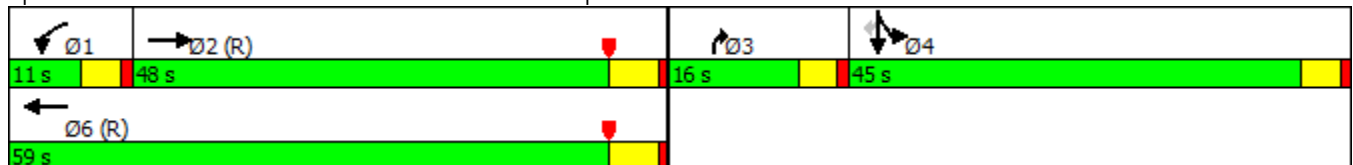


Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↖	↑↑	↗	↖	↕	↗
Traffic Volume (vph)	905	27	791	78	640	142	421
Future Volume (vph)	905	27	791	78	640	142	421
Turn Type	NA	Prot	NA	Prot	Split	NA	Perm
Protected Phases	2	1	6	3	4	4	
Permitted Phases							4
Detector Phase	2	1	6	3	4	4	4
Switch Phase							
Minimum Initial (s)	10.0	5.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	22.4	9.6	15.4	9.5	14.6	14.6	14.6
Total Split (s)	48.0	11.0	59.0	16.0	45.0	45.0	45.0
Total Split (%)	40.0%	9.2%	49.2%	13.3%	37.5%	37.5%	37.5%
Yellow Time (s)	4.4	3.6	4.4	3.5	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	4.6	5.4	4.5	4.6	4.6	4.6
Lead/Lag	Lag	Lead		Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes
Recall Mode	C-Max	None	C-Max	None	Max	Max	Max
Act Effect Green (s)	47.0	5.9	53.6	5.8	48.1	48.1	48.1
Actuated g/C Ratio	0.39	0.05	0.45	0.05	0.40	0.40	0.40
v/c Ratio	0.71	0.35	0.53	0.41	0.62	0.58	0.51
Control Delay	34.9	66.6	25.6	9.3	34.4	33.1	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	66.6	25.6	9.3	34.4	33.1	12.6
LOS	C	E	C	A	C	C	B
Approach Delay	34.9		26.9			26.3	
Approach LOS	C		C			C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 11 (9%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 28.7
 Intersection LOS: C
 Intersection Capacity Utilization 66.9%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.






















HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑				↗	↖	↑↑	↗
Traffic Volume (vph)	0	905	20	27	791	0	0	0	78	640	142	421
Future Volume (vph)	0	905	20	27	791	0	0	0	78	640	142	421
Ideal Flow (vphp)	1800	1800	1800	1700	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Lane Util. Factor		0.95		1.00	0.95				1.00	0.95	0.95	1.00
Frbp, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00		1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00				1.00	0.95	0.97	1.00
Satd. Flow (prot)		3600		1700	3600				1800	1700	1800	1800
Flt Permitted		1.00		0.95	1.00				1.00	0.95	0.97	1.00
Satd. Flow (perm)		3600		1700	3600				1800	1700	1800	1800
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	973	22	29	851	0	0	0	84	688	153	453
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	81	0	0	166
Lane Group Flow (vph)	0	994	0	29	851	0	0	0	3	420	421	287
Confl. Peds. (#/hr)			3			1						
Turn Type		NA		Prot	NA				Prot	Split	NA	Perm
Protected Phases		2		1	6				3	4	4	
Permitted Phases												4
Actuated Green, G (s)		44.3		3.8	52.7				4.7	48.1	48.1	48.1
Effective Green, g (s)		44.3		3.8	52.7				4.7	48.1	48.1	48.1
Actuated g/C Ratio		0.37		0.03	0.44				0.04	0.40	0.40	0.40
Clearance Time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Vehicle Extension (s)		3.0		2.0	3.0				3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1329		53	1581				70	681	721	721
v/s Ratio Prot		c0.28		0.02	c0.24				c0.00	c0.25	0.23	
v/s Ratio Perm												0.16
v/c Ratio		0.75		0.55	0.54				0.05	0.62	0.58	0.40
Uniform Delay, d1		33.0		57.3	24.7				55.5	28.6	28.1	25.6
Progression Factor		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		3.9		6.1	1.3				0.3	4.2	3.4	1.6
Delay (s)		36.9		63.3	26.0				55.8	32.8	31.6	27.3
Level of Service		D		E	C				E	C	C	C
Approach Delay (s)		36.9			27.3			55.8			30.5	
Approach LOS		D			C			E			C	

Intersection Summary			
HCM 2000 Control Delay	32.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.1
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	905	20	27	791	0	0	0	78	640	142	421
Future Volume (veh/h)	0	905	20	27	791	0	0	0	78	640	142	421
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	0	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	973	16	29	851	0	0	0	56	797	0	451
Adj No. of Lanes	0	2	0	1	2	0	0	0	1	2	0	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1776	29	42	1984	0	0	0	0	1090	0	515
Arrive On Green	0.00	0.52	0.52	0.03	0.58	0.00	0.00	0.00	0.00	0.34	0.00	0.34
Sat Flow, veh/h	0	3533	57	1619	3510	0		0		3238	0	1530
Grp Volume(v), veh/h	0	483	506	29	851	0		0.0		797	0	451
Grp Sat Flow(s),veh/h/ln	0	1710	1790	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	22.9	22.9	2.1	16.7	0.0				26.0	0.0	33.3
Cycle Q Clear(g_c), s	0.0	22.9	22.9	2.1	16.7	0.0				26.0	0.0	33.3
Prop In Lane	0.00		0.03	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	882	923	42	1984	0				1090	0	515
V/C Ratio(X)	0.00	0.55	0.55	0.69	0.43	0.00				0.73	0.00	0.88
Avail Cap(c_a), veh/h	0	882	923	86	1984	0				1090	0	515
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.09	0.09	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	19.6	19.6	58.0	14.1	0.0				35.0	0.0	37.4
Incr Delay (d2), s/veh	0.0	2.4	2.3	0.7	0.1	0.0				4.3	0.0	18.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	11.3	11.8	1.0	7.8	0.0				12.3	0.0	16.7
LnGrp Delay(d),s/veh	0.0	22.0	21.9	58.7	14.2	0.0				39.4	0.0	55.9
LnGrp LOS		C	C	E	B					D		E
Approach Vol, veh/h		989			880						1248	
Approach Delay, s/veh		22.0			15.6						45.3	
Approach LOS		C			B						D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	7.7	67.3		45.0		75.0						
Change Period (Y+Rc), s	4.6	5.4		4.6		5.4						
Max Green Setting (Gmax), s	6.4	42.6		40.4		53.6						
Max Q Clear Time (g_c+I1), s	4.1	24.9		35.3		18.7						
Green Ext Time (p_c), s	0.0	10.9		2.3		15.9						
Intersection Summary												
HCM 2010 Ctrl Delay			29.5									
HCM 2010 LOS			C									
Notes												

Timings

9: Waterman Av. & Orange Show Rd./Orange Show Rd.

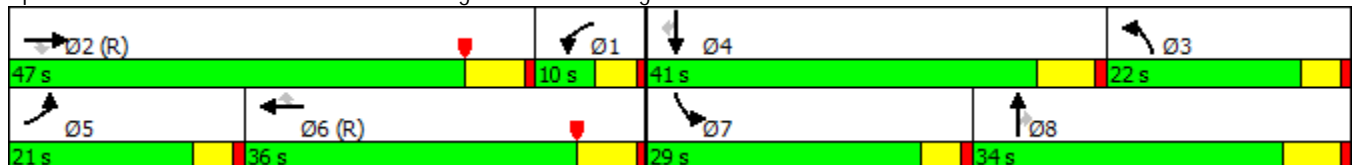
3/27/2017

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	242	849	187	206	611	119	307	1018	196	143	958	155
Future Volume (vph)	242	849	187	206	611	119	307	1018	196	143	958	155
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.2	35.2	9.6	35.2	35.2	9.6	33.2	33.2	9.6	33.2	33.2
Total Split (s)	21.0	47.0	47.0	10.0	36.0	36.0	22.0	34.0	34.0	29.0	41.0	41.0
Total Split (%)	17.5%	39.2%	39.2%	8.3%	30.0%	30.0%	18.3%	28.3%	28.3%	24.2%	34.2%	34.2%
Yellow Time (s)	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effect Green (s)	16.4	40.8	40.8	5.4	29.8	29.8	17.4	37.2	37.2	15.0	34.8	34.8
Actuated g/C Ratio	0.14	0.34	0.34	0.04	0.25	0.25	0.14	0.31	0.31	0.12	0.29	0.29
v/c Ratio	1.10	0.73	0.27	2.86	1.44	0.22	1.31	0.96	0.31	0.71	0.97	0.25
Control Delay	136.2	39.0	4.8	890.5	244.3	2.8	207.4	60.5	9.4	67.9	63.0	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	136.2	39.0	4.8	890.5	244.3	2.8	207.4	60.5	9.4	67.9	63.0	4.2
LOS	F	D	A	F	F	A	F	E	A	E	E	A
Approach Delay		52.4			356.0			83.6			56.3	
Approach LOS		D			F			F			E	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 110.5 (92%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 2.86
 Intersection Signal Delay: 119.8
 Intersection LOS: F
 Intersection Capacity Utilization 113.9%
 ICU Level of Service H
 Analysis Period (min) 15

Splits and Phases: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	242	849	187	206	611	119	307	1018	196	143	958	155
Future Volume (vph)	242	849	187	206	611	119	307	1018	196	143	958	155
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	255	894	197	217	643	125	323	1072	206	151	1008	163
RTOR Reduction (vph)	0	0	130	0	0	94	0	0	117	0	0	116
Lane Group Flow (vph)	255	894	67	217	643	31	323	1072	89	151	1008	47
Confl. Peds. (#/hr)			1						1			
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	16.4	40.8	40.8	5.4	29.8	29.8	17.4	37.2	37.2	15.0	34.8	34.8
Effective Green, g (s)	16.4	40.8	40.8	5.4	29.8	29.8	17.4	37.2	37.2	15.0	34.8	34.8
Actuated g/C Ratio	0.14	0.34	0.34	0.05	0.25	0.25	0.14	0.31	0.31	0.12	0.29	0.29
Clearance Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	232	1224	612	76	447	447	246	1116	558	212	1044	522
v/s Ratio Prot	c0.15	0.25		c0.13	c0.36		c0.19	c0.30		0.09	c0.28	
v/s Ratio Perm			0.04			0.02			0.05			0.03
v/c Ratio	1.10	0.73	0.11	2.86	1.44	0.07	1.31	0.96	0.16	0.71	0.97	0.09
Uniform Delay, d1	51.8	34.8	27.1	57.3	45.1	34.5	51.3	40.7	30.1	50.4	42.0	31.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	88.1	3.9	0.4	869.9	209.7	0.3	166.8	18.2	0.1	9.0	19.8	0.1
Delay (s)	139.9	38.6	27.5	927.2	254.8	34.8	218.1	58.9	30.2	59.5	61.8	31.1
Level of Service	F	D	C	F	F	C	F	E	C	E	E	C
Approach Delay (s)		56.2			375.0			87.3			57.8	
Approach LOS		E			F			F			E	

Intersection Summary		
HCM 2000 Control Delay	125.8	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.27	F
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	113.9%	21.6
Analysis Period (min)	15	ICU Level of Service
		H

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	242	849	187	206	611	119	307	1018	196	143	958	155
Future Volume (veh/h)	242	849	187	206	611	119	307	1018	196	143	958	155
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	255	894	144	217	643	90	323	1072	155	151	1008	125
Adj No. of Lanes	1	2	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	221	1163	513	1466	2020	1717	235	1162	519	176	992	444
Arrive On Green	0.14	0.34	0.34	0.91	1.00	1.00	0.14	0.34	0.34	0.11	0.29	0.29
Sat Flow, veh/h	1619	3420	1509	1619	1800	1530	1619	3420	1529	1619	3420	1530
Grp Volume(v), veh/h	255	894	144	217	643	90	323	1072	155	151	1008	125
Grp Sat Flow(s),veh/h/ln	1619	1710	1509	1619	1800	1530	1619	1710	1529	1619	1710	1530
Q Serve(g_s), s	16.4	28.0	8.4	1.8	0.0	0.0	17.4	36.2	7.3	11.0	34.8	14.6
Cycle Q Clear(g_c), s	16.4	28.0	8.4	1.8	0.0	0.0	17.4	36.2	7.3	11.0	34.8	14.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	221	1163	513	1466	2020	1717	235	1162	519	176	992	444
V/C Ratio(X)	1.15	0.77	0.28	0.15	0.32	0.05	1.38	0.92	0.30	0.86	1.02	0.28
Avail Cap(c_a), veh/h	221	1163	513	1466	2020	1717	235	1162	519	329	992	444
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.70	0.70	0.70	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.8	35.4	28.9	0.6	0.0	0.0	51.3	38.1	19.4	52.6	42.6	122.8
Incr Delay (d2), s/veh	98.5	3.5	1.0	0.0	0.4	0.1	193.7	12.1	0.3	4.6	32.7	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.4	13.7	3.6	0.8	0.2	0.0	20.4	19.1	3.1	5.1	20.9	6.2
LnGrp Delay(d),s/veh	150.3	38.9	29.8	0.6	0.4	0.1	245.0	50.2	19.7	57.2	75.3	123.1
LnGrp LOS	F	D	C	A	A	A	F	D	B	E	F	F
Approach Vol, veh/h		1293			950			1550			1284	
Approach Delay, s/veh		59.8			0.4			87.7			77.8	
Approach LOS		E			A			F			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	116.9	47.0	23.6	41.0	21.0	142.9	17.6	47.0				
Change Period (Y+Rc), s	6.2	* 6.2	6.2	* 6.2	4.6	6.2	4.6	6.2				
Max Green Setting (Gmax), s	5.4	* 41	17.4	* 35	16.4	29.8	24.4	27.8				
Max Q Clear Time (g_c+I1), s	3.8	30.0	19.4	36.8	18.4	2.0	13.0	38.2				
Green Ext Time (p_c), s	0.2	5.7	0.0	0.0	0.0	6.6	0.1	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			61.8									
HCM 2010 LOS			E									
Notes												

Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↕	
Traffic Vol, veh/h	3	21	16	1517	1438	9
Future Vol, veh/h	3	21	16	1517	1438	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	75	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	3	23	17	1649	1563	10

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	2427	786	1573 0
Stage 1	1568	-	- -
Stage 2	859	-	- -
Critical Hdwy	6.8	6.9	4.1 -
Critical Hdwy Stg 1	5.8	-	- -
Critical Hdwy Stg 2	5.8	-	- -
Follow-up Hdwy	3.5	3.3	2.2 -
Pot Cap-1 Maneuver	*27	*490	*736 -
Stage 1	*462	-	- -
Stage 2	*434	-	- -
Platoon blocked, %		1	1 -
Mov Cap-1 Maneuver	*26	*490	*736 -
Mov Cap-2 Maneuver	*214	-	- -
Stage 1	*462	-	- -
Stage 2	*424	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	13.9	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	* 736	-	214	490	-	-
HCM Lane V/C Ratio	0.024	-	0.015	0.047	-	-
HCM Control Delay (s)	10	-	22.1	12.7	-	-
HCM Lane LOS	B	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0	0.1	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Timings
11: Waterman Av. & Driveway 2/Park Center Dr.

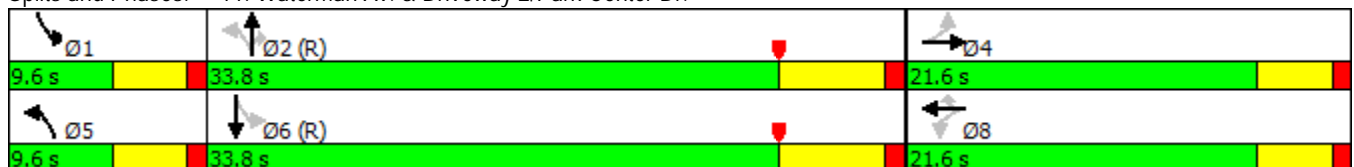


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↕		↕	↕	↕	↑↑	↕	↕	↕↕
Traffic Volume (vph)	55	0	127	0	43	38	1506	15	10	1655
Future Volume (vph)	55	0	127	0	43	38	1506	15	10	1655
Turn Type	Perm	NA	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4		8		5	2		1	6
Permitted Phases	4		8		8	2		2	6	
Detector Phase	4	4	8	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	21.6	21.6	21.6	9.6	23.2	23.2	9.6	33.2
Total Split (s)	21.6	21.6	21.6	21.6	21.6	9.6	33.8	33.8	9.6	33.8
Total Split (%)	33.2%	33.2%	33.2%	33.2%	33.2%	14.8%	52.0%	52.0%	14.8%	52.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		4.6	4.6	4.6	6.2	6.2	4.6	6.2
Lead/Lag						Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)		11.9		11.9	11.9	45.9	44.6	44.6	46.8	40.7
Actuated g/C Ratio		0.18		0.18	0.18	0.71	0.69	0.69	0.72	0.63
v/c Ratio		0.44		0.43	0.11	0.18	0.68	0.01	0.01	0.83
Control Delay		10.5		27.1	0.5	6.2	12.9	0.0	4.5	20.4
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		10.5		27.1	0.5	6.2	12.9	0.0	4.5	20.4
LOS		B		C	A	A	B	A	A	C
Approach Delay		10.5		20.4			12.6			20.3
Approach LOS		B		C			B			C

Intersection Summary

Cycle Length: 65
 Actuated Cycle Length: 65
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 16.5
 Intersection LOS: B
 Intersection Capacity Utilization 74.0%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 11: Waterman Av. & Driveway 2/Park Center Dr.



HCM Signalized Intersection Capacity Analysis
 11: Waterman Av. & Driveway 2/Park Center Dr.

Gateway South Building 4 TIA (JN 10187)






















3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↕	↕	↕	↕↕	
Traffic Volume (vph)	55	0	84	127	0	43	38	1506	15	10	1655	23
Future Volume (vph)	55	0	84	127	0	43	38	1506	15	10	1655	23
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)		4.6			4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes		1.00			1.00	0.99	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.92			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1621			1800	1800	1615	3600	1800	1700	3600	
Flt Permitted		0.80			0.63	1.00	0.10	1.00	1.00	0.11	1.00	
Satd. Flow (perm)		1326			1800	1800	176	3600	1800	1700	3600	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	61	0	93	141	0	48	42	1673	17	11	1839	26
RTOR Reduction (vph)	0	111	0	0	0	41	0	0	7	0	1	0
Lane Group Flow (vph)	0	43	0	0	141	7	42	1673	10	11	1864	0
Confl. Peds. (#/hr)						1			1			1
Confl. Bikes (#/hr)									1			1
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		9.9			9.9	9.9	41.8	38.7	38.7	37.6	36.6	
Effective Green, g (s)		9.9			9.9	9.9	41.8	38.7	38.7	37.6	36.6	
Actuated g/C Ratio		0.15			0.15	0.15	0.64	0.60	0.60	0.58	0.56	
Clearance Time (s)		4.6			4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Vehicle Extension (s)		3.0			3.0	3.0	2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)		201			274	274	181	2143	1071	983	2027	
v/s Ratio Prot							c0.01	0.46		0.00	c0.52	
v/s Ratio Perm		0.03			0.08	0.00	0.14		0.01	0.01		
v/c Ratio		0.21			0.51	0.03	0.23	0.78	0.01	0.01	0.92	
Uniform Delay, d1		24.1			25.3	23.4	11.6	9.9	5.4	8.0	12.9	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.5			1.6	0.0	0.2	2.9	0.0	0.0	8.3	
Delay (s)		24.7			27.0	23.5	11.8	12.8	5.4	8.0	21.1	
Level of Service		C			C	C	B	B	A	A	C	
Approach Delay (s)		24.7			26.1			12.7			21.0	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	15.4
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	0	84	127	0	43	38	1506	15	10	1655	23
Future Volume (veh/h)	55	0	84	127	0	43	38	1506	15	10	1655	23
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	61	0	81	141	0	35	42	1673	17	11	1839	26
Adj No. of Lanes	0	1	0	0	1	1	1	2	1	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	133	28	109	333	0	349	177	1782	780	151	1705	24
Arrive On Green	0.23	0.00	0.23	0.23	0.00	0.23	0.04	0.52	0.52	0.01	0.49	0.49
Sat Flow, veh/h	236	124	478	974	0	1528	1619	3420	1497	1619	3451	49
Grp Volume(v), veh/h	142	0	0	141	0	35	42	1673	17	11	909	956
Grp Sat Flow(s),veh/h/ln	838	0	0	974	0	1528	1619	1710	1497	1619	1710	1790
Q Serve(g_s), s	3.1	0.0	0.0	0.0	0.0	1.2	0.8	29.8	0.4	0.2	32.1	32.1
Cycle Q Clear(g_c), s	12.4	0.0	0.0	9.3	0.0	1.2	0.8	29.8	0.4	0.2	32.1	32.1
Prop In Lane	0.43		0.57	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	270	0	0	333	0	349	177	1782	780	151	845	884
V/C Ratio(X)	0.53	0.00	0.00	0.42	0.00	0.10	0.24	0.94	0.02	0.07	1.08	1.08
Avail Cap(c_a), veh/h	319	0	0	378	0	400	235	1782	780	253	845	884
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.2	0.0	0.0	22.9	0.0	19.8	15.1	14.6	7.5	14.2	16.4	16.4
Incr Delay (d2), s/veh	1.6	0.0	0.0	0.9	0.0	0.1	0.3	11.1	0.1	0.1	53.5	54.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	0.0	2.4	0.0	0.5	0.4	16.7	0.2	0.1	27.6	29.1
LnGrp Delay(d),s/veh	25.8	0.0	0.0	23.8	0.0	19.9	15.4	25.6	7.6	14.3	69.9	71.0
LnGrp LOS	C			C		B	B	C	A	B	F	F
Approach Vol, veh/h		142			176			1732			1876	
Approach Delay, s/veh		25.8			23.0			25.2			70.2	
Approach LOS		C			C			C			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.5	40.1		19.4	7.3	38.3		19.4				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.0	27.6		17.0	5.0	27.6		17.0				
Max Q Clear Time (g_c+I1), s	2.2	31.8		14.4	2.8	34.1		11.3				
Green Ext Time (p_c), s	0.0	0.0		0.5	0.0	0.0		0.9				
Intersection Summary												
HCM 2010 Ctrl Delay			46.6									
HCM 2010 LOS			D									

Timings
12: Waterman Av./Waterman Av. & Hospitality Ln.

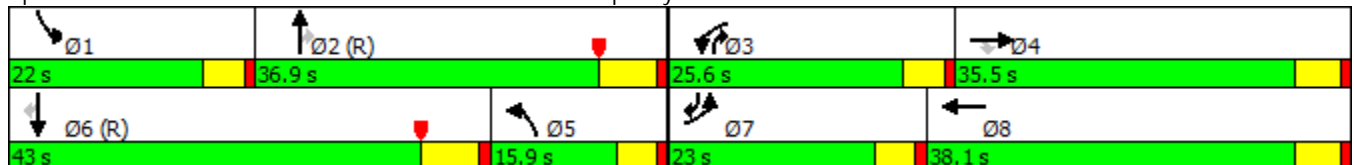


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗	↗	↗	↘	↗	↘
Traffic Volume (vph)	211	462	697	522	555	361	697	949	280	1347	186
Future Volume (vph)	211	462	697	522	555	361	697	949	280	1347	186
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8	5	2	3	1	6	7
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	3	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	15.1	15.1	9.6	38.1	9.6	36.2	9.6	9.6	36.2	9.6
Total Split (s)	23.0	35.5	35.5	25.6	38.1	15.9	36.9	25.6	22.0	43.0	23.0
Total Split (%)	19.2%	29.6%	29.6%	21.3%	31.8%	13.3%	30.8%	21.3%	18.3%	35.8%	19.2%
Yellow Time (s)	3.6	4.1	4.1	3.6	4.1	3.6	5.2	3.6	3.6	5.2	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	5.1	4.6	5.1	4.6	6.2	4.6	4.6	6.2	4.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effect Green (s)	17.6	29.5	29.5	21.0	32.9	11.3	30.7	57.9	18.3	37.7	56.9
Actuated g/C Ratio	0.15	0.25	0.25	0.18	0.27	0.09	0.26	0.48	0.15	0.31	0.47
v/c Ratio	0.90	0.86	0.66	0.99	0.76	1.28	0.80	0.56	1.15	0.84	0.22
Control Delay	86.7	46.4	27.1	83.7	37.0	190.9	49.7	20.0	148.3	44.3	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.7	46.4	27.1	83.7	37.0	190.9	49.7	20.0	148.3	44.3	7.0
LOS	F	D	C	F	D	F	D	C	F	D	A
Approach Delay		47.5			56.6		61.1			56.5	
Approach LOS		D			E		E			E	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 22 (18%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 115
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.28
 Intersection Signal Delay: 56.0
 Intersection LOS: E
 Intersection Capacity Utilization 98.4%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 12: Waterman Av./Waterman Av. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
 12: Waterman Av./Waterman Av. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)

3/27/2017


























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	211	462	697	522	555	169	361	697	949	280	1347	186
Future Volume (vph)	211	462	697	522	555	169	361	697	949	280	1347	186
Ideal Flow (vphp)	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Lane Util. Factor	1.00	0.91	0.91	0.97	0.95		0.97	0.95	0.88	1.00	0.91	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.94	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Flt Permitted	1.00	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	224	491	741	555	590	180	384	741	1010	298	1433	198
RTOR Reduction (vph)	0	99	137	0	24	0	0	0	79	0	0	40
Lane Group Flow (vph)	224	748	248	555	746	0	384	741	931	298	1433	158
Confl. Peds. (#/hr)						7			5			13
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4						2			6
Actuated Green, G (s)	17.6	29.5	29.5	21.0	32.9		11.3	30.7	51.7	18.3	37.7	55.3
Effective Green, g (s)	17.6	29.5	29.5	21.0	32.9		11.3	30.7	51.7	18.3	37.7	55.3
Actuated g/C Ratio	0.15	0.25	0.25	0.18	0.27		0.09	0.26	0.43	0.15	0.31	0.46
Clearance Time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	4.0	2.0	2.0	4.0	2.0
Lane Grp Cap (vph)	249	885	442	560	987		301	921	1551	259	1696	829
v/s Ratio Prot	0.13	c0.21		c0.17	c0.21		c0.12	c0.21	0.11	c0.18	0.27	0.03
v/s Ratio Perm			0.14						0.15			0.06
v/c Ratio	0.90	0.85	0.56	0.99	0.76		1.28	0.80	0.60	1.15	0.84	0.19
Uniform Delay, d1	50.3	43.1	39.6	49.4	39.9		54.4	41.8	26.2	50.9	38.4	19.1
Progression Factor	1.00	1.00	1.00	1.00	0.83		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	30.9	7.5	1.6	33.5	3.0		147.4	7.4	0.5	102.8	5.4	0.0
Delay (s)	81.2	50.6	41.2	83.1	36.2		201.7	49.3	26.7	153.6	43.8	19.2
Level of Service	F	D	D	F	D		F	D	C	F	D	B
Approach Delay (s)		52.8			55.9			66.0			58.2	
Approach LOS		D			E			E			E	

Intersection Summary		
HCM 2000 Control Delay	59.0	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.96	E
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	98.4%	20.5
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		F

HCM 2010 Signalized Intersection Summary
 12: Waterman Av./Waterman Av. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	211	462	697	522	555	169	361	697	949	280	1347	186
Future Volume (veh/h)	211	462	697	522	555	169	361	697	949	280	1347	186
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	224	489	612	555	590	165	384	741	644	298	1433	128
Adj No. of Lanes	1	1	2	2	2	0	2	2	2	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	247	456	775	517	727	203	1552	2395	2350	235	1507	697
Arrive On Green	0.15	0.25	0.25	0.17	0.28	0.28	0.53	0.70	0.70	0.14	0.31	0.31
Sat Flow, veh/h	1619	1800	3060	2956	2638	736	2956	3420	2683	1619	4914	1511
Grp Volume(v), veh/h	224	489	612	555	382	373	384	741	644	298	1433	128
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	1710	1664	1478	1710	1342	1619	1638	1511
Q Serve(g_s), s	16.3	30.4	17.2	21.0	25.0	25.1	8.5	10.0	4.7	17.4	34.3	3.5
Cycle Q Clear(g_c), s	16.3	30.4	17.2	21.0	25.0	25.1	8.5	10.0	4.7	17.4	34.3	3.5
Prop In Lane	1.00		1.00	1.00		0.44	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	247	456	775	517	471	459	1552	2395	2350	235	1507	697
V/C Ratio(X)	0.91	1.07	0.79	1.07	0.81	0.81	0.25	0.31	0.27	1.27	0.95	0.18
Avail Cap(c_a), veh/h	248	456	775	517	471	459	1552	2395	2350	235	1507	697
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.73	0.73	0.73	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.0	44.8	24.5	49.5	40.5	40.6	15.5	6.9	1.2	51.3	40.7	28.4
Incr Delay (d2), s/veh	32.6	62.9	5.5	55.0	7.7	8.1	0.0	0.3	0.3	150.3	14.1	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.5	23.0	7.8	12.5	12.8	12.5	3.5	4.7	1.8	17.6	17.5	2.8
LnGrp Delay(d),s/veh	82.6	107.7	30.0	104.5	48.2	48.6	15.6	7.2	1.5	201.6	54.8	29.0
LnGrp LOS	F	F	C	F	D	D	B	A	A	F	D	C
Approach Vol, veh/h		1325			1310			1769			1859	
Approach Delay, s/veh		67.6			72.2			7.0			76.6	
Approach LOS		E			E			A			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	22.0	91.2	25.6	35.5	70.2	43.0	22.9	38.2				
Change Period (Y+Rc), s	4.6	6.2	4.6	5.1	6.2	* 6.2	4.6	5.1				
Max Green Setting (Gmax), s	17.4	30.7	21.0	30.4	11.3	* 37	18.4	33.0				
Max Q Clear Time (g_c+I1), s	19.4	12.0	23.0	32.4	10.5	36.3	18.3	27.1				
Green Ext Time (p_c), s	0.0	10.5	0.0	0.0	0.1	0.5	0.0	4.4				
Intersection Summary												
HCM 2010 Ctrl Delay			54.1									
HCM 2010 LOS			D									
Notes												

Intersection

Int Delay, s/veh 12.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↘ ↗	↗	↗↗↗	
Traffic Vol, veh/h	0	0	622	2006	1994	860
Future Vol, veh/h	0	0	622	2006	1994	860
Conflicting Peds, #/hr	0	0	0	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	0	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	676	2180	2167	935

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	1087	2170 0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	7.1	5.3 -
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.9	3.1 -
Pot Cap-1 Maneuver	0	*464	*~ 584 -
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	1	1 -
Mov Cap-1 Maneuver	-	*463	*~ 584 -
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	26.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	~ * 584	-	-	-	-
HCM Lane V/C Ratio	1.158	-	-	-	-
HCM Control Delay (s)	113.5	-	0	-	-
HCM Lane LOS	F	-	A	-	-
HCM 95th %tile Q(veh)	22.7	-	-	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection

Int Delay, s/veh 0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations						↗		↑↑			↑↑	
Traffic Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Future Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	-	-	-	Free	-	-	-	-	-	None
Storage Length	-	-	-	-	-	0	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	1197	0	988	0	0	739	169

Major/Minor

	Minor1	Major1	Major2
Conflicting Flow All	-	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	0	0	0
Stage 1	0	0	0
Stage 2	0	0	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach

	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt

	NBTWBLn1	SBT	SBR
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	-	0	-
HCM Lane LOS	-	A	-
HCM 95th %tile Q(veh)	-	-	-

Intersection

Int Delay, s/veh

Movement	NWL	NWR
Lane Configurations		
Traffic Vol, veh/h	0	0
Future Vol, veh/h	0	0
Conflicting Peds, #/hr	0	0
Sign Control	Stop	Stop
RT Channelized	-	-
Storage Length	-	-
Veh in Median Storage, #	0	-
Grade, %	0	-
Peak Hour Factor	96	96
Heavy Vehicles, %	0	0
Mvmt Flow	0	0

Major/Minor

Conflicting Flow All	
Stage 1	
Stage 2	
Critical Hdwy	
Critical Hdwy Stg 1	
Critical Hdwy Stg 2	
Follow-up Hdwy	
Pot Cap-1 Maneuver	
Stage 1	
Stage 2	
Platoon blocked, %	
Mov Cap-1 Maneuver	
Mov Cap-2 Maneuver	
Stage 1	
Stage 2	

Approach

HCM Control Delay, s	
HCM LOS	

Minor Lane/Major Mvmt

Timings

15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.

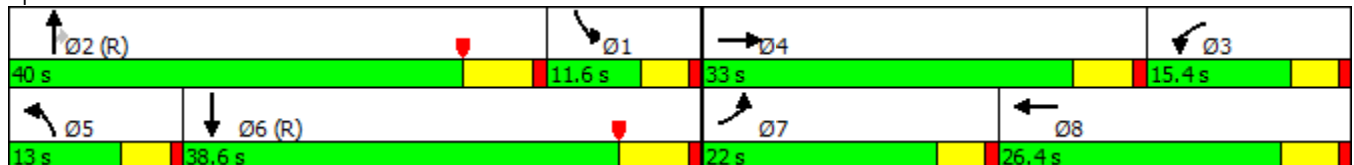


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖↗	↕	↖	↕	↖	↕	↗	↖	↕
Traffic Volume (vph)	682	836	251	529	66	1219	122	420	744
Future Volume (vph)	682	836	251	529	66	1219	122	420	744
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	9.6	31.4	9.6	15.4	9.6	36.2	36.2	9.6	36.2
Total Split (s)	22.0	33.0	15.4	26.4	13.0	40.0	40.0	11.6	38.6
Total Split (%)	22.0%	33.0%	15.4%	26.4%	13.0%	40.0%	40.0%	11.6%	38.6%
Yellow Time (s)	3.6	4.4	3.6	4.4	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	5.4	4.6	6.2	6.2	4.6	6.2
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)	17.4	27.6	10.8	21.0	7.4	33.8	33.8	7.0	35.3
Actuated g/C Ratio	0.17	0.28	0.11	0.21	0.07	0.34	0.34	0.07	0.35
v/c Ratio	1.31	1.09	1.46	1.17	0.56	1.07	0.18	3.76	0.81
Control Delay	185.3	89.1	268.3	122.9	61.2	78.6	1.0	1275.6	34.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	185.3	89.1	268.3	122.9	61.2	78.6	1.0	1275.6	34.9
LOS	F	F	F	F	E	E	A	F	C
Approach Delay		127.3		153.6		71.0			404.9
Approach LOS		F		F		E			F

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 28 (28%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 3.76
 Intersection Signal Delay: 187.3
 Intersection LOS: F
 Intersection Capacity Utilization 131.2%
 ICU Level of Service H
 Analysis Period (min) 15

Splits and Phases: 15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.

























HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	682	836	199	251	529	406	66	1219	122	420	744	245
Future Volume (vph)	682	836	199	251	529	406	66	1219	122	420	744	245
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.93		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	726	889	212	267	563	432	70	1297	130	447	791	261
RTOR Reduction (vph)	0	21	0	0	92	0	0	0	87	0	31	0
Lane Group Flow (vph)	726	1080	0	267	903	0	70	1297	43	447	1021	0
Confl. Peds. (#/hr)			3						1			6
Confl. Bikes (#/hr)			1						1			
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	17.4	27.6		10.8	21.0		6.4	32.9	32.9	7.9	34.4	
Effective Green, g (s)	17.4	27.6		10.8	21.0		6.4	32.9	32.9	7.9	34.4	
Actuated g/C Ratio	0.17	0.28		0.11	0.21		0.06	0.33	0.33	0.08	0.34	
Clearance Time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	556	993		183	756		108	1184	592	134	1238	
v/s Ratio Prot	c0.23	0.30		c0.16	c0.25		0.04	c0.36		c0.26	0.28	
v/s Ratio Perm									0.02			
v/c Ratio	1.31	1.09		1.46	1.19		0.65	1.10	0.07	3.34	0.82	
Uniform Delay, d1	41.3	36.2		44.6	39.5		45.7	33.5	23.1	46.0	30.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	150.3	55.4		234.1	100.0		9.6	56.3	0.2	1070.0	6.3	
Delay (s)	191.6	91.6		278.7	139.5		55.3	89.8	23.3	1116.0	36.4	
Level of Service	F	F		F	F		E	F	C	F	D	
Approach Delay (s)		131.3			169.0			82.4			358.3	
Approach LOS		F			F			F			F	

Intersection Summary		
HCM 2000 Control Delay	183.0	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.40	F
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	131.2%	20.8
Analysis Period (min)	15	ICU Level of Service
		H

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	682	836	199	251	529	406	66	1219	122	420	744	245
Future Volume (veh/h)	682	836	199	251	529	406	66	1219	122	420	744	245
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	726	889	205	267	563	391	70	1297	99	447	791	200
Adj No. of Lanes	2	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	514	760	175	175	421	292	87	1156	510	1396	3143	795
Arrive On Green	0.17	0.28	0.28	0.11	0.22	0.22	0.05	0.34	0.34	0.86	1.00	1.00
Sat Flow, veh/h	2956	2752	634	1619	1932	1342	1619	3420	1509	1619	2704	684
Grp Volume(v), veh/h	726	552	542	267	498	456	70	1297	99	447	500	491
Grp Sat Flow(s),veh/h/ln	1478	1710	1676	1619	1710	1563	1619	1710	1509	1619	1710	1678
Q Serve(g_s), s	17.4	27.6	27.6	10.8	21.8	21.8	4.3	33.8	4.6	5.3	0.0	0.0
Cycle Q Clear(g_c), s	17.4	27.6	27.6	10.8	21.8	21.8	4.3	33.8	4.6	5.3	0.0	0.0
Prop In Lane	1.00		0.38	1.00		0.86	1.00		1.00	1.00		0.41
Lane Grp Cap(c), veh/h	514	472	463	175	373	341	87	1156	510	1396	1987	1950
V/C Ratio(X)	1.41	1.17	1.17	1.53	1.34	1.34	0.80	1.12	0.19	0.32	0.25	0.25
Avail Cap(c_a), veh/h	514	472	463	175	373	341	136	1156	510	1396	1987	1950
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.70	0.70	0.70	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.3	36.2	36.2	44.6	39.1	39.1	46.8	33.1	23.5	1.3	0.0	0.0
Incr Delay (d2), s/veh	193.1	91.8	92.5	263.9	168.8	170.3	8.2	66.7	0.8	0.0	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.9	25.0	24.6	17.6	27.7	25.5	2.1	26.6	2.1	2.3	0.2	0.2
LnGrp Delay(d),s/veh	234.4	128.0	128.7	308.5	207.9	209.4	55.0	99.8	24.3	1.4	0.3	0.3
LnGrp LOS	F	F	F	F	F	F	E	F	C	A	A	A
Approach Vol, veh/h		1820			1221			1466			1438	
Approach Delay, s/veh		170.7			230.5			92.6			0.6	
Approach LOS		F			F			F			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	94.8	40.0	16.2	33.0	10.0	124.8	22.0	27.2				
Change Period (Y+Rc), s	6.2	* 6.2	5.4	* 5.4	4.6	6.2	4.6	5.4				
Max Green Setting (Gmax), s	7.0	* 34	10.8	* 28	8.4	32.4	17.4	21.0				
Max Q Clear Time (g_c+I1), s	7.3	35.8	12.8	29.6	6.3	2.0	19.4	23.8				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			122.6									
HCM 2010 LOS			F									
Notes												

Timings
16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

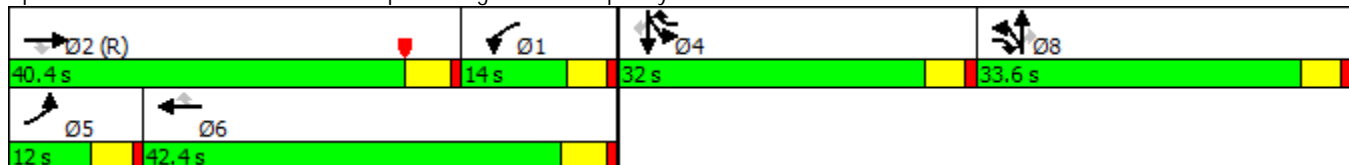


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	504	149	286	260	509	227	964	319	55	1087	366
Future Volume (vph)	105	504	149	286	260	509	227	964	319	55	1087	366
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	8	1	6	4	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	39.1	33.6	9.6	39.1	22.6	33.6	33.6	33.6	22.6	22.6	22.6
Total Split (s)	12.0	40.4	33.6	14.0	42.4	32.0	33.6	33.6	33.6	32.0	32.0	32.0
Total Split (%)	10.0%	33.7%	28.0%	11.7%	35.3%	26.7%	28.0%	28.0%	28.0%	26.7%	26.7%	26.7%
Yellow Time (s)	3.6	4.1	3.6	3.6	4.1	3.6	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lead	Lead		Lag	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	C-Max	Max	None	None	Max	Max	Max	Max	Max	Max	Max
Act Effect Green (s)	7.4	35.3	69.4	9.4	37.3	65.2	29.0	29.0	29.0	27.4	27.4	27.4
Actuated g/C Ratio	0.06	0.29	0.58	0.08	0.31	0.54	0.24	0.24	0.24	0.23	0.23	0.23
v/c Ratio	1.11	0.52	0.15	1.26	0.45	0.36	0.55	1.25	0.62	0.15	1.45	0.77
Control Delay	158.1	40.3	9.1	188.3	21.2	11.8	45.6	159.1	25.5	38.4	245.8	37.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	158.1	40.3	9.1	188.3	21.2	11.8	45.6	159.1	25.5	38.4	245.8	37.6
LOS	F	D	A	F	C	B	D	F	C	D	F	D
Approach Delay		50.4			64.2			115.5			187.8	
Approach LOS		D			E			F			F	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT, Start of Yellow
 Natural Cycle: 125
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.45
 Intersection Signal Delay: 116.7
 Intersection LOS: F
 Intersection Capacity Utilization 113.6%
 ICU Level of Service H
 Analysis Period (min) 15

Splits and Phases: 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)

























3/30/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	504	149	286	260	509	227	964	319	55	1087	366
Future Volume (vph)	105	504	149	286	260	509	227	964	319	55	1087	366
Ideal Flow (vphpl)	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lane Util. Factor	1.00	0.95	1.00	0.97	0.91	0.91	0.91	0.91	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	0.99	0.99	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600	1377	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600	1377	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	115	554	164	314	286	559	249	1059	351	60	1195	402
RTOR Reduction (vph)	0	0	28	0	147	26	0	0	130	0	0	115
Lane Group Flow (vph)	115	554	136	314	419	253	224	1084	221	60	1195	287
Confl. Peds. (#/hr)			4			7			2			
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	7.4	35.3	64.3	9.4	37.3	64.7	29.0	29.0	29.0	27.4	27.4	27.4
Effective Green, g (s)	7.4	35.3	64.3	9.4	37.3	64.7	29.0	29.0	29.0	27.4	27.4	27.4
Actuated g/C Ratio	0.06	0.29	0.54	0.08	0.31	0.54	0.24	0.24	0.24	0.23	0.23	0.23
Clearance Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	104	1059	1033	250	1119	742	410	870	435	388	822	411
v/s Ratio Prot	c0.07	c0.15	0.03	c0.10	0.12	0.08	0.13	c0.30		0.04	c0.33	
v/s Ratio Perm			0.04			0.11			0.12			0.16
v/c Ratio	1.11	0.52	0.13	1.26	0.37	0.34	0.55	1.25	0.51	0.15	1.45	0.70
Uniform Delay, d1	56.3	35.3	13.9	55.3	32.2	15.6	39.8	45.5	39.3	37.0	46.3	42.5
Progression Factor	1.09	1.10	1.22	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	103.0	1.2	0.2	143.5	0.2	0.3	5.2	120.3	4.2	0.8	211.0	9.5
Delay (s)	164.6	40.0	17.2	198.8	32.5	15.9	44.9	165.8	43.5	37.9	257.3	52.0
Level of Service	F	D	B	F	C	B	D	F	D	D	F	D
Approach Delay (s)		52.7			73.5			123.6			199.5	
Approach LOS		D			E			F			F	

Intersection Summary		
HCM 2000 Control Delay	125.3	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.08	F
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	113.6%	18.9
Analysis Period (min)	15	ICU Level of Service
		H

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	504	149	286	260	509	227	964	319	55	1087	366
Future Volume (veh/h)	105	504	149	286	260	509	227	964	319	55	1087	366
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	115	554	121	314	286	532	249	1059	316	60	1195	365
Adj No. of Lanes	1	2	1	2	1	2	1	2	1	1	2	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	100	1006	818	658	814	2044	391	870	369	370	781	349
Arrive On Green	0.12	0.59	0.59	0.22	0.45	0.45	0.24	0.24	0.24	0.23	0.23	0.23
Sat Flow, veh/h	1619	3420	1524	3048	1800	2973	1619	3600	1526	1619	3420	1530
Grp Volume(v), veh/h	115	554	121	314	286	532	249	1059	316	60	1195	365
Grp Sat Flow(s),veh/h/ln	1619	1710	1524	1524	1800	1487	1619	1800	1526	1619	1710	1530
Q Serve(g_s), s	7.4	11.8	3.1	10.8	12.4	8.3	16.5	29.0	23.8	3.6	27.4	27.4
Cycle Q Clear(g_c), s	7.4	11.8	3.1	10.8	12.4	8.3	16.5	29.0	23.8	3.6	27.4	27.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	100	1006	818	658	815	2044	391	870	369	370	781	349
V/C Ratio(X)	1.15	0.55	0.15	0.48	0.35	0.26	0.64	1.22	0.86	0.16	1.53	1.04
Avail Cap(c_a), veh/h	100	1006	818	658	814	2044	391	870	369	370	781	349
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.56	0.56	0.56	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.6	19.9	8.0	41.1	21.4	7.4	40.8	45.5	43.5	37.1	46.3	46.3
Incr Delay (d2), s/veh	114.4	1.2	0.2	0.2	0.3	0.1	7.7	108.2	21.8	0.9	245.1	60.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	5.7	2.0	4.6	6.2	5.9	8.2	27.5	12.2	1.7	39.5	17.5
LnGrp Delay(d),s/veh	167.0	21.1	8.2	41.3	21.6	7.5	48.5	153.7	65.3	38.0	291.4	106.6
LnGrp LOS	F	C	A	D	C	A	D	F	E	D	F	F
Approach Vol, veh/h		790			1132			1624			1620	
Approach Delay, s/veh		40.4			20.5			120.4			240.4	
Approach LOS		D			C			F			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	31.5	40.4		32.0	12.0	59.9		33.6				
Change Period (Y+Rc), s	5.1	* 5.1		4.6	4.6	5.1		4.6				
Max Green Setting (Gmax), s	9.4	* 35		27.4	7.4	37.3		29.0				
Max Q Clear Time (g_c+I1), s	12.8	13.8		29.4	9.4	14.4		31.0				
Green Ext Time (p_c), s	0.0	4.0		0.0	0.0	4.7		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	123.9											
HCM 2010 LOS	F											
Notes												

APPENDIX 8.2:

**HORIZON YEAR (2040) WITH PROJECT CONDITIONS INTERSECTION OPERATIONS
ANALYSIS WORKSHEETS**

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Timings
1: I-215 SB Ramps & Auto Center Rd.



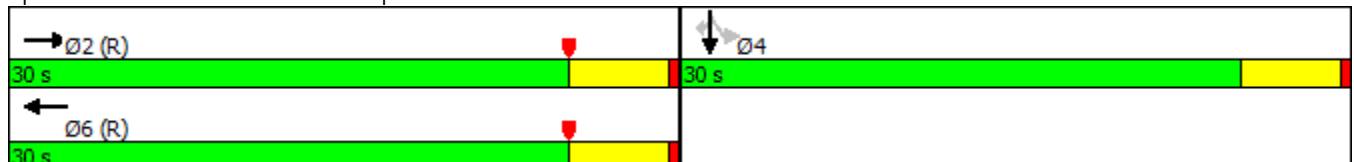
Lane Group	EBT	WBT	SBL	SBT	SBR
Lane Configurations	↑↑	↑↑	↗	↖	↗
Traffic Volume (vph)	375	578	1410	40	286
Future Volume (vph)	375	578	1410	40	286
Turn Type	NA	NA	Perm	NA	Perm
Protected Phases	2	6		4	
Permitted Phases			4		4
Detector Phase	2	6	4	4	4
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	30.0	22.5	22.5	22.5	22.5
Total Split (s)	30.0	30.0	30.0	30.0	30.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	Max	Max	Max
Act Effct Green (s)	25.0	25.0	25.0	25.0	25.0
Actuated g/C Ratio	0.42	0.42	0.42	0.42	0.42
v/c Ratio	0.34	0.41	1.08	1.04	0.36
Control Delay	10.5	12.6	79.1	64.1	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.5	12.6	79.1	64.1	7.2
LOS	B	B	E	E	A
Approach Delay	10.5	12.6		60.9	
Approach LOS	B	B		E	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 2 (3%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.08
 Intersection Signal Delay: 42.1
 Intersection Capacity Utilization 68.9%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service C

Splits and Phases: 1: I-215 SB Ramps & Auto Center Rd.



HCM Signalized Intersection Capacity Analysis
1: I-215 SB Ramps & Auto Center Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017




















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑					↘	↙	↗
Traffic Volume (vph)	0	375	122	0	578	0	0	0	0	1410	40	286
Future Volume (vph)	0	375	122	0	578	0	0	0	0	1410	40	286
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		5.0			5.0					5.0	5.0	5.0
Lane Util. Factor		0.95			0.95					0.95	0.95	1.00
Frt		0.96			1.00					1.00	1.00	0.85
Flt Protected		1.00			1.00					0.95	0.95	1.00
Satd. Flow (prot)		3600			3600					1700	1800	1800
Flt Permitted		1.00			1.00					0.95	0.95	1.00
Satd. Flow (perm)		3600			3600					1700	1800	1800
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	399	130	0	615	0	0	0	0	1500	43	304
RTOR Reduction (vph)	0	53	0	0	0	0	0	0	0	0	0	92
Lane Group Flow (vph)	0	477	0	0	615	0	0	0	0	765	778	212
Turn Type		NA			NA					Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases										4		4
Actuated Green, G (s)		25.0			25.0					25.0	25.0	25.0
Effective Green, g (s)		25.0			25.0					25.0	25.0	25.0
Actuated g/C Ratio		0.42			0.42					0.42	0.42	0.42
Clearance Time (s)		5.0			5.0					5.0	5.0	5.0
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1500			1500					708	750	750
v/s Ratio Prot		0.13			c0.17							
v/s Ratio Perm										c0.45	0.43	0.12
v/c Ratio		0.32			0.41					1.08	1.04	0.28
Uniform Delay, d1		11.8			12.3					17.5	17.5	11.6
Progression Factor		1.00			0.95					1.00	1.00	1.00
Incremental Delay, d2		0.6			0.7					57.7	42.9	0.9
Delay (s)		12.3			12.5					75.2	60.4	12.5
Level of Service		B			B					E	E	B
Approach Delay (s)		12.3			12.5			0.0			58.6	
Approach LOS		B			B			A			E	

Intersection Summary

HCM 2000 Control Delay	41.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	375	122	0	578	0	0	0	0	1410	40	286
Future Volume (veh/h)	0	375	122	0	578	0	0	0	0	1410	40	286
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	0	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	399	123	0	615	0				1531	0	199
Adj No. of Lanes	0	2	0	0	2	0				2	0	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	1076	328	0	1425	0				1349	0	637
Arrive On Green	0.00	0.42	0.42	0.00	0.83	0.00				0.42	0.00	0.42
Sat Flow, veh/h	0	2673	788	0	3600	0				3238	0	1530
Grp Volume(v), veh/h	0	263	259	0	615	0				1531	0	199
Grp Sat Flow(s),veh/h/ln	0	1710	1661	0	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	6.4	6.5	0.0	2.8	0.0				25.0	0.0	5.2
Cycle Q Clear(g_c), s	0.0	6.4	6.5	0.0	2.8	0.0				25.0	0.0	5.2
Prop In Lane	0.00		0.47	0.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	713	692	0	1425	0				1349	0	637
V/C Ratio(X)	0.00	0.37	0.37	0.00	0.43	0.00				1.13	0.00	0.31
Avail Cap(c_a), veh/h	0	713	692	0	1425	0				1349	0	637
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	12.1	12.1	0.0	3.2	0.0				17.5	0.0	11.7
Incr Delay (d2), s/veh	0.0	1.5	1.6	0.0	1.0	0.0				70.3	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.3	3.3	0.0	1.4	0.0				24.2	0.0	2.4
LnGrp Delay(d),s/veh	0.0	13.5	13.6	0.0	4.1	0.0				87.8	0.0	13.0
LnGrp LOS		B	B		A					F		B
Approach Vol, veh/h		522			615						1730	
Approach Delay, s/veh		13.6			4.1						79.2	
Approach LOS		B			A						E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		30.0		30.0		30.0						
Change Period (Y+Rc), s		5.0		5.0		5.0						
Max Green Setting (Gmax), s		25.0		25.0		25.0						
Max Q Clear Time (g_c+I1), s		8.5		27.0		4.8						
Green Ext Time (p_c), s		6.4		0.0		7.0						
Intersection Summary												
HCM 2010 Ctrl Delay			51.2									
HCM 2010 LOS			D									
Notes												

Timings

2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.

3/27/2017

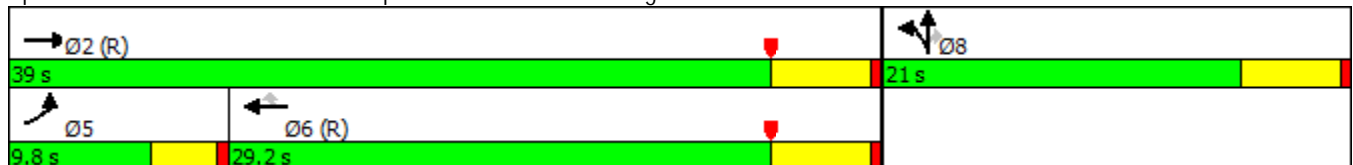


Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations	↶	↷	↶	↷	↶	↷	↷
Traffic Volume (vph)	181	1604	580	431	436	13	1076
Future Volume (vph)	181	1604	580	431	436	13	1076
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm
Protected Phases	5	2	6		8	8	
Permitted Phases				6			8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	8.0	8.0	8.0	5.0	5.0	5.0
Minimum Split (s)	8.5	39.0	13.0	13.0	10.0	10.0	10.0
Total Split (s)	9.8	39.0	29.2	29.2	21.0	21.0	21.0
Total Split (%)	16.3%	65.0%	48.7%	48.7%	35.0%	35.0%	35.0%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max
Act Effct Green (s)	6.3	34.0	24.2	24.2	16.0	16.0	16.0
Actuated g/C Ratio	0.10	0.57	0.40	0.40	0.27	0.27	0.27
v/c Ratio	1.12	0.86	0.44	0.47	0.54	0.52	1.14
Control Delay	111.3	12.8	19.8	11.0	24.1	23.3	99.3
Queue Delay	0.0	36.3	0.0	0.0	0.0	0.0	0.6
Total Delay	111.3	49.1	19.8	11.0	24.1	23.3	99.9
LOS	F	D	B	B	C	C	F
Approach Delay		55.4	16.0			77.4	
Approach LOS		E	B			E	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 1 (2%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.14
 Intersection Signal Delay: 54.0
 Intersection LOS: D
 Intersection Capacity Utilization 94.9%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.



























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑	↗	↘	↗	↗↗			
Traffic Volume (vph)	181	1604	0	0	580	431	436	13	1076	0	0	0
Future Volume (vph)	181	1604	0	0	580	431	436	13	1076	0	0	0
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800	1700	1800	1800	1800	1800	1800
Total Lost time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	0.88			
Frbp, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	1700	3600			3600	1800	1700	1800	3600			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	1700	3600			3600	1800	1700	1800	3600			
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	199	1763	0	0	637	474	479	14	1182	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	283	0	0	73	0	0	0
Lane Group Flow (vph)	199	1763	0	0	637	191	244	249	1109	0	0	0
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	6.3	34.0			24.2	24.2	16.0	16.0	16.0			
Effective Green, g (s)	6.3	34.0			24.2	24.2	16.0	16.0	16.0			
Actuated g/C Ratio	0.10	0.57			0.40	0.40	0.27	0.27	0.27			
Clearance Time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Vehicle Extension (s)	2.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	178	2040			1452	726	453	480	960			
v/s Ratio Prot	c0.12	c0.49			0.18		0.14	0.14				
v/s Ratio Perm						0.11			c0.31			
v/c Ratio	1.12	0.86			0.44	0.26	0.54	0.52	1.15			
Uniform Delay, d1	26.9	11.0			13.0	11.9	18.8	18.7	22.0			
Progression Factor	0.91	0.85			1.45	8.97	1.00	1.00	1.00			
Incremental Delay, d2	81.3	2.4			0.8	0.8	4.5	4.0	81.6			
Delay (s)	105.8	11.8			19.7	108.0	23.4	22.7	103.6			
Level of Service	F	B			B	F	C	C	F			
Approach Delay (s)		21.4			57.3			79.9			0.0	
Approach LOS		C			E			E			A	

Intersection Summary			
HCM 2000 Control Delay	50.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	94.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 				 			
Traffic Volume (veh/h)	181	1604	0	0	580	431	436	13	1076	0	0	0
Future Volume (veh/h)	181	1604	0	0	580	431	436	13	1076	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1700	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	199	1763	0	0	637	392	489	0	1023			
Adj No. of Lanes	1	2	0	0	2	1	2	0	2			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	170	1938	0	0	1379	617	863	0	816			
Arrive On Green	0.11	0.57	0.00	0.00	0.54	0.54	0.27	0.00	0.27			
Sat Flow, veh/h	1619	3510	0	0	3510	1530	3238	0	3060			
Grp Volume(v), veh/h	199	1763	0	0	637	392	489	0	1023			
Grp Sat Flow(s),veh/h/ln	1619	1710	0	0	1710	1530	1619	0	1530			
Q Serve(g_s), s	6.3	27.7	0.0	0.0	6.9	10.8	7.8	0.0	16.0			
Cycle Q Clear(g_c), s	6.3	27.7	0.0	0.0	6.9	10.8	7.8	0.0	16.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	170	1938	0	0	1379	617	863	0	816			
V/C Ratio(X)	1.17	0.91	0.00	0.00	0.46	0.64	0.57	0.00	1.25			
Avail Cap(c_a), veh/h	170	1938	0	0	1379	617	863	0	816			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.79	0.79	1.00	0.00	1.00			
Uniform Delay (d), s/veh	26.9	11.6	0.0	0.0	9.9	10.8	19.0	0.0	22.0			
Incr Delay (d2), s/veh	122.4	7.8	0.0	0.0	0.9	3.9	2.7	0.0	124.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	8.6	14.8	0.0	0.0	3.4	5.2	3.8	0.0	20.8			
LnGrp Delay(d),s/veh	149.2	19.5	0.0	0.0	10.8	14.7	21.7	0.0	146.2			
LnGrp LOS	F	B			B	B	C		F			
Approach Vol, veh/h		1962			1029			1512				
Approach Delay, s/veh		32.6			12.3			105.9				
Approach LOS		C			B			F				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		39.0			9.8	29.2		21.0				
Change Period (Y+Rc), s		5.0			3.5	5.0		5.0				
Max Green Setting (Gmax), s		34.0			6.3	24.2		16.0				
Max Q Clear Time (g_c+I1), s		29.7			8.3	12.8		18.0				
Green Ext Time (p_c), s		4.1			0.0	10.2		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				52.6								
HCM 2010 LOS				D								
Notes												

Timings
3: E St. & Orange Show Rd.

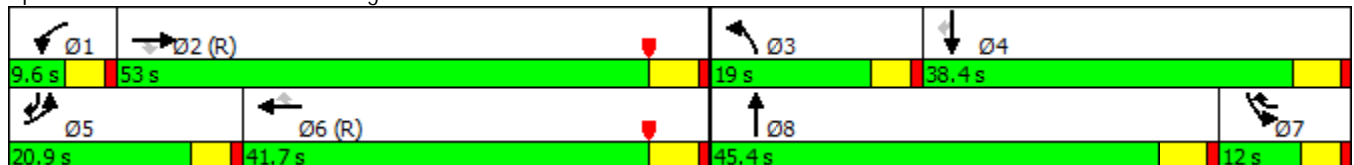


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↖↗	↑↑	↗	↖↗	↑↑	↗	↖	↑↑	↖↗	↑↑	↗
Traffic Volume (vph)	429	1399	808	99	597	69	137	201	76	230	202
Future Volume (vph)	429	1399	808	99	597	69	137	201	76	230	202
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8	7	4	5
Permitted Phases			2			6					4
Detector Phase	5	2	2	1	6	7	3	8	7	4	5
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0
Minimum Split (s)	9.6	39.4	39.4	9.6	39.4	9.6	9.6	38.4	9.6	38.4	9.6
Total Split (s)	20.9	53.0	53.0	9.6	41.7	12.0	19.0	45.4	12.0	38.4	20.9
Total Split (%)	17.4%	44.2%	44.2%	8.0%	34.8%	10.0%	15.8%	37.8%	10.0%	32.0%	17.4%
Yellow Time (s)	3.6	4.4	4.4	3.6	4.4	3.6	3.6	4.4	3.6	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4	4.6	5.4	4.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	Max	None	Max	None
Act Effct Green (s)	16.3	47.6	47.6	5.0	36.3	44.5	13.3	40.0	7.4	34.1	55.8
Actuated g/C Ratio	0.14	0.40	0.40	0.04	0.30	0.37	0.11	0.33	0.06	0.28	0.46
v/c Ratio	1.12	1.11	0.89	0.85	0.62	0.10	0.83	0.29	0.44	0.26	0.26
Control Delay	111.8	88.5	19.6	101.0	48.3	6.0	84.7	20.9	61.6	34.4	12.2
Queue Delay	0.0	0.5	17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	111.8	89.0	36.7	101.0	48.3	6.0	84.7	20.9	61.6	34.4	12.2
LOS	F	F	D	F	D	A	F	C	E	C	B
Approach Delay		76.7			51.3			40.1		29.6	
Approach LOS		E			D			D		C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 92 (77%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.12
 Intersection Signal Delay: 62.9
 Intersection LOS: E
 Intersection Capacity Utilization 93.3%
 ICU Level of Service F
 Analysis Period (min) 15































Splits and Phases: 3: E St. & Orange Show Rd.



























HCM Signalized Intersection Capacity Analysis
3: E St. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 			 		 	 	
Traffic Volume (vph)	429	1399	808	99	597	69	137	201	120	76	230	202
Future Volume (vph)	429	1399	808	99	597	69	137	201	120	76	230	202
Ideal Flow (vphp)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Total Lost time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95		0.97	0.95	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3200	3600	1800	3200	3600	1800	1700	3600		3200	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3200	3600	1800	3200	3600	1800	1700	3600		3200	3600	1800
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	488	1590	918	112	678	78	156	228	136	86	261	230
RTOR Reduction (vph)	0	0	316	0	0	50	0	73	0	0	0	55
Lane Group Flow (vph)	488	1590	602	113	678	28	156	291	0	86	261	175
Confl. Peds. (#/hr)									2			
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	16.3	47.6	47.6	5.0	36.3	43.7	13.3	40.0		7.4	34.1	50.4
Effective Green, g (s)	16.3	47.6	47.6	5.0	36.3	43.7	13.3	40.0		7.4	34.1	50.4
Actuated g/C Ratio	0.14	0.40	0.40	0.04	0.30	0.36	0.11	0.33		0.06	0.28	0.42
Clearance Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	2.0	2.0	3.0		2.0	3.0	2.0
Lane Grp Cap (vph)	434	1428	714	133	1089	655	188	1200		197	1023	756
v/s Ratio Prot	c0.15	c0.44		0.04	0.19	0.00	c0.09	0.08		c0.03	c0.07	0.03
v/s Ratio Perm			0.33			0.01						0.07
v/c Ratio	1.12	1.11	0.84	0.85	0.62	0.04	0.83	0.24		0.44	0.26	0.23
Uniform Delay, d1	51.9	36.2	32.8	57.1	36.0	24.6	52.2	29.0		54.3	33.1	22.4
Progression Factor	0.98	0.97	1.07	1.06	1.27	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	65.7	54.6	3.9	31.5	2.3	0.0	24.0	0.5		0.6	0.6	0.1
Delay (s)	116.4	89.8	39.1	92.0	47.8	24.7	76.3	29.5		54.9	33.7	22.4
Level of Service	F	F	D	F	D	C	E	C		D	C	C
Approach Delay (s)		78.6			51.5			43.5			32.4	
Approach LOS		E			D			D			C	
Intersection Summary												
HCM 2000 Control Delay			64.8									E
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			120.0							20.0		
Intersection Capacity Utilization			93.3%									F
Analysis Period (min)			15									
c Critical Lane Group												

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	429	1399	808	99	597	69	137	201	120	76	230	202
Future Volume (veh/h)	429	1399	808	99	597	69	137	201	120	76	230	202
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	488	1590	667	112	678	47	156	228	104	86	261	208
Adj No. of Lanes	2	2	1	2	2	1	1	2	0	2	2	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	402	1368	612	123	1045	547	178	770	340	153	940	629
Arrive On Green	0.27	0.80	0.80	0.08	0.61	0.61	0.12	0.33	0.33	0.05	0.28	0.28
Sat Flow, veh/h	2956	3420	1530	2956	3420	1530	1524	2309	1019	2956	3420	1530
Grp Volume(v), veh/h	488	1590	667	112	678	47	156	167	165	86	261	208
Grp Sat Flow(s),veh/h/ln	1478	1710	1530	1478	1710	1530	1524	1710	1618	1478	1710	1530
Q Serve(g_s), s	16.3	48.0	48.0	4.5	15.3	0.4	12.1	8.7	9.1	3.4	7.2	11.1
Cycle Q Clear(g_c), s	16.3	48.0	48.0	4.5	15.3	0.4	12.1	8.7	9.1	3.4	7.2	11.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.63	1.00		1.00
Lane Grp Cap(c), veh/h	402	1368	612	123	1045	547	178	570	539	153	941	629
V/C Ratio(X)	1.22	1.16	1.09	0.91	0.65	0.09	0.88	0.29	0.31	0.56	0.28	0.33
Avail Cap(c_a), veh/h	402	1368	612	123	1045	547	183	570	539	182	941	629
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.15	0.15	0.15	0.81	0.81	0.81	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.7	12.0	12.0	54.8	19.2	5.9	52.1	29.6	29.7	55.6	34.1	24.1
Incr Delay (d2), s/veh	100.4	74.6	45.3	46.3	2.5	0.3	32.9	1.3	1.5	1.2	0.7	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.2	35.4	26.4	2.6	7.5	0.4	6.7	4.3	4.3	1.4	3.5	4.9
LnGrp Delay(d),s/veh	144.1	86.6	57.3	101.1	21.7	6.2	85.0	30.9	31.2	56.8	34.9	25.5
LnGrp LOS	F	F	F	F	C	A	F	C	C	E	C	C
Approach Vol, veh/h		2745			837			488			555	
Approach Delay, s/veh		89.7			31.5			48.3			34.8	
Approach LOS		F			C			D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.6	53.4	18.6	38.4	20.9	42.1	11.6	45.4				
Change Period (Y+Rc), s	4.6	5.4	4.6	5.4	4.6	5.4	5.4	* 5.4				
Max Green Setting (Gmax), s	5.0	47.6	14.4	33.0	16.3	36.3	7.4	* 40				
Max Q Clear Time (g_c+I1), s	6.5	50.0	14.1	13.1	18.3	17.3	5.4	11.1				
Green Ext Time (p_c), s	0.0	0.0	0.0	2.3	0.0	17.8	0.5	1.9				
Intersection Summary												
HCM 2010 Ctrl Delay			68.2									
HCM 2010 LOS			E									
Notes												

Timings
4: Arrowhead Av. & Orange Show Rd.

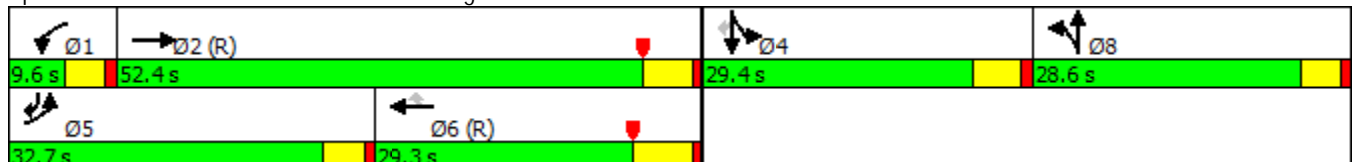


Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Configurations	↙	↕	↙	↕	↗	↗	↙	↕	↗
Traffic Volume (vph)	418	1119	5	427	183	1	177	12	321
Future Volume (vph)	418	1119	5	427	183	1	177	12	321
Turn Type	Prot	NA	Prot	NA	Perm	NA	Split	NA	pm+ov
Protected Phases	5	2	1	6		8	4	4	5
Permitted Phases					6				4
Detector Phase	5	2	1	6	6	8	4	4	5
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	28.4	9.6	29.2	29.2	28.6	29.4	29.4	9.6
Total Split (s)	32.7	52.4	9.6	29.3	29.3	28.6	29.4	29.4	32.7
Total Split (%)	27.3%	43.7%	8.0%	24.4%	24.4%	23.8%	24.5%	24.5%	27.3%
Yellow Time (s)	3.6	4.4	3.6	5.2	5.2	3.6	4.4	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	6.2	6.2	4.6	5.4	5.4	4.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag				Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				Yes
Recall Mode	None	C-Max	None	C-Max	C-Max	Max	Max	Max	None
Act Effect Green (s)	28.1	54.7	5.0	23.1	23.1	24.0	24.0	24.0	52.9
Actuated g/C Ratio	0.23	0.46	0.04	0.19	0.19	0.20	0.20	0.20	0.44
v/c Ratio	1.19	0.78	0.09	0.70	0.40	0.02	0.31	0.30	0.37
Control Delay	144.2	37.0	58.0	51.4	8.0	25.0	44.0	43.6	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	144.2	37.0	58.0	51.4	8.0	25.0	44.0	43.6	2.1
LOS	F	D	E	D	A	C	D	D	A
Approach Delay		66.0		38.5		25.0		17.5	
Approach LOS		E		D		C		B	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 86 (72%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.19
 Intersection Signal Delay: 50.4
 Intersection LOS: D
 Intersection Capacity Utilization 71.8%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 4: Arrowhead Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
4: Arrowhead Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)























3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↖	↖	↗		↖	↗	↖
Traffic Volume (vph)	418	1119	8	5	427	183	0	1	4	177	12	321
Future Volume (vph)	418	1119	8	5	427	183	0	1	4	177	12	321
Ideal Flow (vphp)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	6.2	6.2		4.6		5.4	5.4	4.6
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00		0.98		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.88		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00		0.95	0.96	1.00
Satd. Flow (prot)	1700	3600		1700	3600	1800		1800		1700	1800	1800
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00		0.95	0.96	1.00
Satd. Flow (perm)	1700	3600		1700	3600	1800		1800		1700	1800	1800
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	475	1272	9	6	485	208	0	1	5	201	14	365
RTOR Reduction (vph)	0	1	0	0	0	168	0	4	0	0	0	207
Lane Group Flow (vph)	475	1280	0	6	485	40	0	2	0	107	108	158
Confl. Peds. (#/hr)									6			7
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		8	8		4	4	5
Permitted Phases						6						4
Actuated Green, G (s)	28.1	51.0		1.0	23.1	23.1		24.0		24.0	24.0	52.1
Effective Green, g (s)	28.1	51.0		1.0	23.1	23.1		24.0		24.0	24.0	52.1
Actuated g/C Ratio	0.23	0.42		0.01	0.19	0.19		0.20		0.20	0.20	0.43
Clearance Time (s)	4.6	5.4		4.6	6.2	6.2		4.6		5.4	5.4	4.6
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0		3.0		3.0	3.0	2.0
Lane Grp Cap (vph)	398	1530		14	693	346		360		340	360	781
v/s Ratio Prot	c0.28	c0.36		0.00	0.13			c0.00		c0.06	0.06	0.05
v/s Ratio Perm						0.02						0.04
v/c Ratio	1.19	0.84		0.43	0.70	0.12		0.01		0.31	0.30	0.20
Uniform Delay, d1	46.0	30.8		59.2	45.2	40.0		38.4		41.0	40.9	21.1
Progression Factor	1.46	1.30		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	89.5	0.5		7.5	5.8	0.7		0.0		2.4	2.1	0.0
Delay (s)	156.7	40.4		66.7	51.0	40.7		38.5		43.4	43.0	21.1
Level of Service	F	D		E	D	D		D		D	D	C
Approach Delay (s)		71.9			48.1			38.5			29.3	
Approach LOS		E			D			D			C	

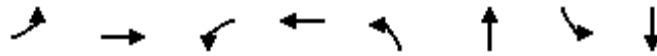
Intersection Summary

HCM 2000 Control Delay	58.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.8
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	418	1119	8	5	427	183	0	1	4	177	12	321
Future Volume (veh/h)	418	1119	8	5	427	183	0	1	4	177	12	321
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	475	1272	8	6	485	188	0	1	5	211	0	271
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	379	1460	9	12	658	295	324	52	260	648	0	661
Arrive On Green	0.31	0.56	0.56	0.01	0.19	0.19	0.00	0.20	0.20	0.20	0.00	0.20
Sat Flow, veh/h	1619	3484	22	1619	3420	1530	1619	260	1298	3238	0	1514
Grp Volume(v), veh/h	475	624	656	6	485	188	0	0	6	211	0	271
Grp Sat Flow(s),veh/h/ln	1619	1710	1796	1619	1710	1530	1619	0	1557	1619	0	1514
Q Serve(g_s), s	28.1	37.7	37.7	0.4	16.0	13.6	0.0	0.0	0.4	6.7	0.0	14.8
Cycle Q Clear(g_c), s	28.1	37.7	37.7	0.4	16.0	13.6	0.0	0.0	0.4	6.7	0.0	14.8
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.83	1.00		1.00
Lane Grp Cap(c), veh/h	379	717	753	12	658	295	324	0	311	648	0	661
V/C Ratio(X)	1.25	0.87	0.87	0.49	0.74	0.64	0.00	0.00	0.02	0.33	0.00	0.41
Avail Cap(c_a), veh/h	379	717	753	67	658	295	324	0	311	648	0	661
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.09	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.3	23.8	23.8	59.3	45.6	44.6	0.0	0.0	38.6	41.1	0.0	23.4
Incr Delay (d2), s/veh	115.9	1.5	1.4	10.9	7.2	10.2	0.0	0.0	0.1	1.3	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	24.7	17.9	18.8	0.2	8.2	6.6	0.0	0.0	0.2	3.1	0.0	6.5
LnGrp Delay(d),s/veh	157.2	25.3	25.2	70.2	52.8	54.8	0.0	0.0	38.7	42.4	0.0	25.3
LnGrp LOS	F	C	C	E	D	D			D	D		C
Approach Vol, veh/h		1755			679			6			482	
Approach Delay, s/veh		60.9			53.5			38.7			32.8	
Approach LOS		E			D			D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.5	56.5		29.4	32.7	29.3		28.6				
Change Period (Y+Rc), s	4.6	* 6.2		5.4	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.0	* 47		24.0	28.1	23.1		24.0				
Max Q Clear Time (g_c+I1), s	2.4	39.7		16.8	30.1	18.0		2.4				
Green Ext Time (p_c), s	0.0	6.3		1.0	0.0	4.5		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				54.5								
HCM 2010 LOS				D								
Notes												

Timings

5: Washington Av./Washington Av. & Orange Show Rd.

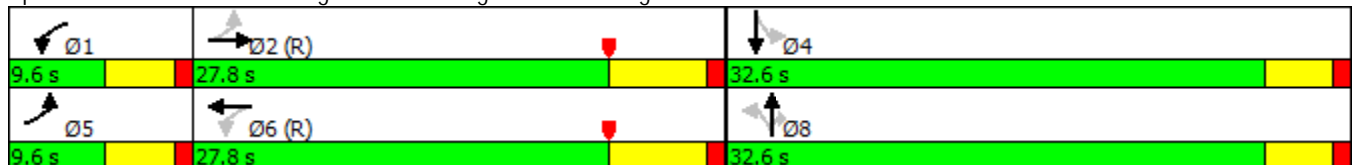


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↙	↕	↙	↕		↕		↕
Traffic Volume (vph)	59	1401	4	518	21	4	14	3
Future Volume (vph)	59	1401	4	518	21	4	14	3
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	9.6	23.2	32.6	32.6	32.6	32.6
Total Split (s)	9.6	27.8	9.6	27.8	32.6	32.6	32.6	32.6
Total Split (%)	13.7%	39.7%	13.7%	39.7%	46.6%	46.6%	46.6%	46.6%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effect Green (s)	58.7	56.2	57.7	51.0		13.6		13.6
Actuated g/C Ratio	0.84	0.80	0.82	0.73		0.19		0.19
v/c Ratio	0.04	0.54	0.00	0.22		0.08		0.08
Control Delay	5.4	11.7	6.8	8.4		20.4		15.3
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	5.4	11.7	6.8	8.4		20.4		15.3
LOS	A	B	A	A		C		B
Approach Delay		11.4		8.4		20.4		15.3
Approach LOS		B		A		C		B

Intersection Summary

Cycle Length: 70
 Actuated Cycle Length: 70
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.54
 Intersection Signal Delay: 10.8
 Intersection LOS: B
 Intersection Capacity Utilization 67.8%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 5: Washington Av./Washington Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 5: Washington Av./Washington Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↖	↗		↗	↖
Traffic Volume (vph)	59	1401	47	4	518	22	21	4	0	14	3	8
Future Volume (vph)	59	1401	47	4	518	22	21	4	0	14	3	8
Ideal Flow (vphp)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2		4.6	6.2			4.6			4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			1.00			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.97	
Satd. Flow (prot)	1700	3600		1700	3600			1800			1800	
Flt Permitted	0.41	1.00		0.12	1.00			0.74			0.83	
Satd. Flow (perm)	1700	3600		1700	3600			1800			1800	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	63	1506	51	4	557	24	23	4	0	15	3	9
RTOR Reduction (vph)	0	2	0	0	2	0	0	0	0	0	8	0
Lane Group Flow (vph)	63	1555	0	4	579	0	0	27	0	0	19	0
Confl. Peds. (#/hr)			1									
Confl. Bikes (#/hr)			1			1						
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)	49.1	46.0		44.9	43.9			7.6			7.6	
Effective Green, g (s)	49.1	46.0		44.9	43.9			7.6			7.6	
Actuated g/C Ratio	0.70	0.66		0.64	0.63			0.11			0.11	
Clearance Time (s)	4.6	6.2		4.6	6.2			4.6			4.6	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0			3.0	
Lane Grp Cap (vph)	1192	2365		1090	2257			195			195	
v/s Ratio Prot	c0.00	c0.43		0.00	0.16							
v/s Ratio Perm	0.03			0.00				0.01			0.01	
v/c Ratio	0.05	0.66		0.00	0.26			0.14			0.10	
Uniform Delay, d1	3.3	7.2		5.5	5.8			28.2			28.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	1.4		0.0	0.3			0.3			0.2	
Delay (s)	3.3	8.7		5.5	6.1			28.6			28.3	
Level of Service	A	A		A	A			C			C	
Approach Delay (s)		8.5			6.1			28.6			28.3	
Approach LOS		A			A			C			C	

Intersection Summary




















HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	15.4
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
 5: Washington Av./Washington Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	1401	47	4	518	22	21	4	0	14	3	8
Future Volume (veh/h)	59	1401	47	4	518	22	21	4	0	14	3	8
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	63	1506	51	4	557	24	23	4	0	15	3	1
Adj No. of Lanes	1	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	643	2328	79	251	2153	93	196	27	129	184	31	7
Arrive On Green	0.05	0.69	0.69	0.01	0.65	0.65	0.08	0.08	0.00	0.08	0.08	0.08
Sat Flow, veh/h	1619	3373	114	1619	3337	144	1199	314	1530	1087	368	81
Grp Volume(v), veh/h	63	762	795	4	285	296	27	0	0	19	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1777	1619	1710	1771	1513	0	1530	1536	0	0
Q Serve(g_s), s	0.8	17.4	17.6	0.1	5.0	5.0	0.4	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.8	17.4	17.6	0.1	5.0	5.0	1.1	0.0	0.0	0.7	0.0	0.0
Prop In Lane	1.00		0.06	1.00		0.08	0.85		1.00	0.79		0.05
Lane Grp Cap(c), veh/h	643	1180	1226	251	1103	1143	223	0	129	222	0	0
V/C Ratio(X)	0.10	0.65	0.65	0.02	0.26	0.26	0.12	0.00	0.00	0.09	0.00	0.00
Avail Cap(c_a), veh/h	677	1180	1226	358	1103	1143	690	0	612	691	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.62	0.62	0.62	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	3.4	6.1	6.1	5.8	5.3	5.3	29.8	0.0	0.0	29.7	0.0	0.0
Incr Delay (d2), s/veh	0.0	2.7	2.7	0.0	0.4	0.3	0.2	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	8.9	9.3	0.0	2.4	2.5	0.5	0.0	0.0	0.3	0.0	0.0
LnGrp Delay(d),s/veh	3.5	8.8	8.7	5.8	5.6	5.6	30.0	0.0	0.0	29.8	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C			C		
Approach Vol, veh/h		1620			585			27				19
Approach Delay, s/veh		8.6			5.6			30.0				29.8
Approach LOS		A			A			C				C
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.0	54.5		10.5	8.1	51.4		10.5				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.0	21.6		28.0	5.0	21.6		28.0				
Max Q Clear Time (g_c+I1), s	2.1	19.6		2.7	2.8	7.0		3.1				
Green Ext Time (p_c), s	0.0	1.9		0.2	0.0	12.4		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			8.2									
HCM 2010 LOS			A									

Intersection

Int Delay, s/veh 1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			4	1	
Traffic Vol, veh/h	10	0	0	15	30	24
Future Vol, veh/h	10	0	0	15	30	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	11	0	0	16	33	26

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	62	46	59	0	-	0
Stage 1	46	-	-	-	-	-
Stage 2	16	-	-	-	-	-
Critical Hdwy	7.1	6.2	4.1	-	-	-
Critical Hdwy Stg 1	6.1	-	-	-	-	-
Critical Hdwy Stg 2	6.1	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	953	1042	1562	-	-	-
Stage 1	984	-	-	-	-	-
Stage 2	1009	-	-	-	-	-
Platoon blocked, %	1	1	1	-	-	-
Mov Cap-1 Maneuver	953	1042	1562	-	-	-
Mov Cap-2 Maneuver	953	-	-	-	-	-
Stage 1	984	-	-	-	-	-
Stage 2	1009	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1562	-	953	-	-
HCM Lane V/C Ratio	-	-	0.011	-	-
HCM Control Delay (s)	0	-	8.8	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection												
Int Delay, s/veh	6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↔	
Traffic Vol, veh/h	0	0	0	0	0	13	0	0	0	29	0	0
Future Vol, veh/h	0	0	0	0	0	13	0	0	0	29	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	70	70	70	70	70	70	70	70	70	70	70
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	19	0	0	0	41	0	0

Major/Minor	Major1			Major2			Minor2				
Conflicting Flow All	19	0	-	-	-	0	-	-	9	9	9
Stage 1	-	-	-	-	-	-	-	-	9	9	-
Stage 2	-	-	-	-	-	-	-	-	0	0	-
Critical Hdwy	4.1	-	-	-	-	-	-	-	6.4	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	5.4	5.5	-
Follow-up Hdwy	2.2	-	-	-	-	-	-	-	3.5	4	3.3
Pot Cap-1 Maneuver	1611	-	0	0	-	-	-	-	1017	890	1079
Stage 1	-	-	0	0	-	-	-	-	1019	892	-
Stage 2	-	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1611	-	-	-	-	-	-	-	1017	0	1079
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	1017	0	-
Stage 1	-	-	-	-	-	-	-	-	1019	0	-
Stage 2	-	-	-	-	-	-	-	-	-	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1611	-	-	-	1017
HCM Lane V/C Ratio	-	-	-	-	0.041
HCM Control Delay (s)	0	-	-	-	8.7
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection

Int Delay, s/veh 7.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	0	0	13	0	10	0	29	24	0
Future Vol, veh/h	0	0	0	0	0	13	0	10	0	29	24	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	70	70	70	70	70	70	70	70	70	70	70
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	19	0	14	0	41	34	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	19	0	0	1	0	0	27	20	1	18	10	9
Stage 1	-	-	-	-	-	-	1	1	-	9	9	-
Stage 2	-	-	-	-	-	-	26	19	-	9	1	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1611	-	-	1635	-	-	988	878	1090	1001	889	1079
Stage 1	-	-	-	-	-	-	1027	899	-	1017	892	-
Stage 2	-	-	-	-	-	-	997	884	-	1017	899	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1611	-	-	1635	-	-	959	878	1090	989	889	1079
Mov Cap-2 Maneuver	-	-	-	-	-	-	959	878	-	989	889	-
Stage 1	-	-	-	-	-	-	1027	899	-	1017	892	-
Stage 2	-	-	-	-	-	-	959	884	-	1001	899	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	9.2	9.2
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	878	1611	-	-	1635	-	-	941
HCM Lane V/C Ratio	0.016	-	-	-	-	-	-	0.08
HCM Control Delay (s)	9.2	0	-	-	0	-	-	9.2
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.3

Timings

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.

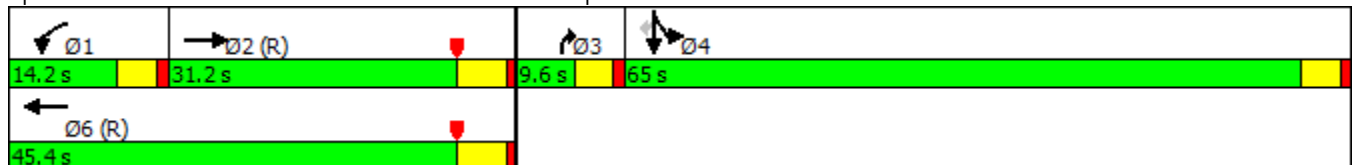


Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↘	↑↑	↗	↘	↗	↗
Traffic Volume (vph)	569	41	616	26	802	364	765
Future Volume (vph)	569	41	616	26	802	364	765
Turn Type	NA	Prot	NA	Prot	Split	NA	Perm
Protected Phases	2	1	6	3	4	4	
Permitted Phases							4
Detector Phase	2	1	6	3	4	4	4
Switch Phase							
Minimum Initial (s)	10.0	5.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	22.4	9.6	15.4	9.5	14.6	14.6	14.6
Total Split (s)	31.2	14.2	45.4	9.6	65.0	65.0	65.0
Total Split (%)	26.0%	11.8%	37.8%	8.0%	54.2%	54.2%	54.2%
Yellow Time (s)	4.4	3.6	4.4	3.5	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	4.6	5.4	4.5	4.6	4.6	4.6
Lead/Lag	Lag	Lead		Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes
Recall Mode	C-Max	None	C-Max	None	Max	Max	Max
Act Effect Green (s)	29.8	7.5	40.0	5.1	64.2	64.2	64.2
Actuated g/C Ratio	0.25	0.06	0.33	0.04	0.54	0.54	0.54
v/c Ratio	0.73	0.42	0.56	0.11	0.69	0.66	0.79
Control Delay	47.8	65.9	34.9	0.9	26.6	25.3	23.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.8	65.9	34.9	0.9	26.6	25.3	23.9
LOS	D	E	C	A	C	C	C
Approach Delay	47.8		36.9			25.1	
Approach LOS	D		D			C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 31.6
 Intersection LOS: C
 Intersection Capacity Utilization 76.3%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.






















HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑				↗	↖	↑↑	↗
Traffic Volume (vph)	0	569	39	41	616	0	0	0	26	802	364	765
Future Volume (vph)	0	569	39	41	616	0	0	0	26	802	364	765
Ideal Flow (vphpl)	1800	1800	1800	1700	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Lane Util. Factor		0.95		1.00	0.95				1.00	0.95	0.95	1.00
Frbp, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Frt		0.99		1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00				1.00	0.95	0.98	1.00
Satd. Flow (prot)		3600		1700	3600				1800	1700	1800	1800
Flt Permitted		1.00		0.95	1.00				1.00	0.95	0.98	1.00
Satd. Flow (perm)		3600		1700	3600				1800	1700	1800	1800
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	618	42	45	670	0	0	0	28	872	396	832
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	27	0	0	94
Lane Group Flow (vph)	0	656	0	45	670	0	0	0	1	628	640	738
Confl. Peds. (#/hr)			6			1						
Confl. Bikes (#/hr)						2						
Turn Type		NA		Prot	NA				Prot	Split	NA	Perm
Protected Phases		2		1	6				3	4	4	
Permitted Phases												4
Actuated Green, G (s)		27.1		6.5	38.2				3.1	64.2	64.2	64.2
Effective Green, g (s)		27.1		6.5	38.2				3.1	64.2	64.2	64.2
Actuated g/C Ratio		0.23		0.05	0.32				0.03	0.54	0.54	0.54
Clearance Time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Vehicle Extension (s)		3.0		2.0	3.0				3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		813		92	1146				46	909	963	963
v/s Ratio Prot		c0.18		0.03	c0.19				c0.00	0.37	0.36	
v/s Ratio Perm												c0.41
v/c Ratio		0.81		0.49	0.58				0.02	0.69	0.66	0.77
Uniform Delay, d1		44.0		55.1	34.3				57.0	20.6	20.1	22.0
Progression Factor		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		8.4		1.5	2.2				0.1	4.3	3.6	5.8
Delay (s)		52.4		56.6	36.4				57.1	24.9	23.7	27.8
Level of Service		D		E	D				E	C	C	C
Approach Delay (s)		52.4			37.7			57.1			25.7	
Approach LOS		D			D			E			C	

Intersection Summary			
HCM 2000 Control Delay	33.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.1
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	569	39	41	616	0	0	0	26	802	364	765
Future Volume (veh/h)	0	569	39	41	616	0	0	0	26	802	364	765
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	0	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	618	31	45	670	0	0	0	15	634	729	830
Adj No. of Lanes	0	2	0	1	2	0	0	0	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1128	57	56	1414	0	0	0	0	815	906	770
Arrive On Green	0.00	0.34	0.34	0.03	0.41	0.00	0.00	0.00	0.00	0.50	0.50	0.50
Sat Flow, veh/h	0	3403	166	1619	3510	0		0		1619	1800	1530
Grp Volume(v), veh/h	0	319	330	45	670	0		0.0		634	729	830
Grp Sat Flow(s),veh/h/ln	0	1710	1769	1619	1710	0				1619	1800	1530
Q Serve(g_s), s	0.0	18.1	18.2	3.3	17.2	0.0				38.4	40.6	60.4
Cycle Q Clear(g_c), s	0.0	18.1	18.2	3.3	17.2	0.0				38.4	40.6	60.4
Prop In Lane	0.00		0.09	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	582	602	56	1414	0				815	906	770
V/C Ratio(X)	0.00	0.55	0.55	0.81	0.47	0.00				0.78	0.80	1.08
Avail Cap(c_a), veh/h	0	582	602	130	1414	0				815	906	770
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.60	0.60	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	32.1	32.1	57.5	25.7	0.0				24.3	24.9	29.8
Incr Delay (d2), s/veh	0.0	3.7	3.6	6.0	0.7	0.0				7.2	7.5	55.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.2	9.5	1.6	8.2	0.0				18.7	21.9	37.1
LnGrp Delay(d),s/veh	0.0	35.7	35.6	63.6	26.4	0.0				31.5	32.4	85.2
LnGrp LOS		D	D	E	C					C	C	F
Approach Vol, veh/h		649			715						2193	
Approach Delay, s/veh		35.7			28.7						52.2	
Approach LOS		D			C						D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	8.7	46.3		65.0		55.0						
Change Period (Y+Rc), s	4.6	5.4		4.6		5.4						
Max Green Setting (Gmax), s	9.6	25.8		60.4		40.0						
Max Q Clear Time (g_c+I1), s	5.3	20.2		62.4		19.2						
Green Ext Time (p_c), s	0.0	3.5		0.0		8.3						
Intersection Summary												
HCM 2010 Ctrl Delay				44.4								
HCM 2010 LOS				D								
Notes												

Timings

9: Waterman Av. & Orange Show Rd./Orange Show Rd.

3/27/2017

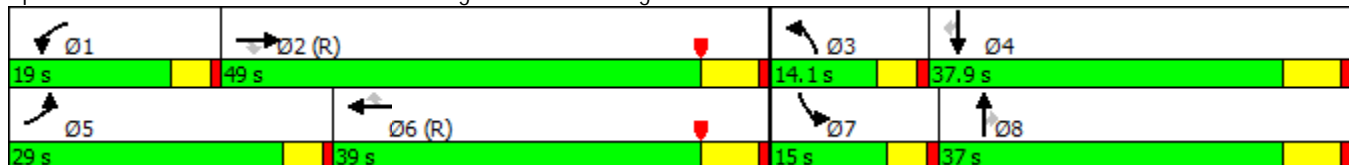


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	211	525	403	150	346	93	127	704	109	101	828	107
Future Volume (vph)	211	525	403	150	346	93	127	704	109	101	828	107
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.2	35.2	9.6	35.2	35.2	9.6	33.2	33.2	9.6	33.2	33.2
Total Split (s)	29.0	49.0	49.0	19.0	39.0	39.0	14.1	37.0	37.0	15.0	37.9	37.9
Total Split (%)	24.2%	40.8%	40.8%	15.8%	32.5%	32.5%	11.8%	30.8%	30.8%	12.5%	31.6%	31.6%
Yellow Time (s)	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Act Effect Green (s)	20.6	43.3	43.3	13.9	36.6	36.6	9.5	31.2	31.2	10.0	31.7	31.7
Actuated g/C Ratio	0.17	0.36	0.36	0.12	0.30	0.30	0.08	0.26	0.26	0.08	0.26	0.26
v/c Ratio	0.84	0.47	0.59	0.88	0.73	0.16	1.10	0.88	0.22	0.83	1.01	0.21
Control Delay	71.9	31.1	18.2	92.5	47.6	2.1	159.2	54.3	3.8	94.8	76.3	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.9	31.1	18.2	92.5	47.6	2.1	159.2	54.3	3.8	94.8	76.3	3.4
LOS	E	C	B	F	D	A	F	D	A	F	E	A
Approach Delay		34.1			51.8			62.6			70.6	
Approach LOS		C			D			E			E	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.10
 Intersection Signal Delay: 54.4
 Intersection LOS: D
 Intersection Capacity Utilization 82.3%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗↗	↘	↘	↗	↘	↘	↗↗	↘	↘	↗↗	↘
Traffic Volume (vph)	211	525	403	150	346	93	127	704	109	101	828	107
Future Volume (vph)	211	525	403	150	346	93	127	704	109	101	828	107
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	245	610	469	174	402	108	148	819	127	117	963	124
RTOR Reduction (vph)	0	0	151	0	0	75	0	0	94	0	0	91
Lane Group Flow (vph)	245	610	318	174	402	33	148	819	33	117	963	33
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	20.6	43.3	43.3	13.9	36.6	36.6	9.5	31.2	31.2	10.0	31.7	31.7
Effective Green, g (s)	20.6	43.3	43.3	13.9	36.6	36.6	9.5	31.2	31.2	10.0	31.7	31.7
Actuated g/C Ratio	0.17	0.36	0.36	0.12	0.31	0.31	0.08	0.26	0.26	0.08	0.26	0.26
Clearance Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	291	1299	649	196	549	549	134	936	468	141	951	475
v/s Ratio Prot	c0.14	0.17		0.10	c0.22		c0.09	0.23		0.07	c0.27	
v/s Ratio Perm			0.18			0.02			0.02			0.02
v/c Ratio	0.84	0.47	0.49	0.89	0.73	0.06	1.10	0.88	0.07	0.83	1.01	0.07
Uniform Delay, d1	48.1	29.5	29.8	52.3	37.3	29.5	55.2	42.5	33.5	54.2	44.1	33.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	18.6	1.2	2.6	34.0	8.4	0.2	108.5	11.2	0.3	30.2	32.3	0.3
Delay (s)	66.7	30.7	32.4	86.3	45.7	29.7	163.8	53.8	33.8	84.3	76.5	33.4
Level of Service	E	C	C	F	D	C	F	D	C	F	E	C
Approach Delay (s)		38.0			53.5			66.3			72.8	
Approach LOS		D			D			E			E	

Intersection Summary

HCM 2000 Control Delay	57.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	211	525	403	150	346	93	127	704	109	101	828	107
Future Volume (veh/h)	211	525	403	150	346	93	127	704	109	101	828	107
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	245	610	370	174	402	67	148	819	91	117	963	101
Adj No. of Lanes	1	2	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	269	1220	546	194	558	475	128	880	394	139	903	404
Arrive On Green	0.17	0.36	0.36	0.12	0.31	0.31	0.08	0.26	0.26	0.09	0.26	0.26
Sat Flow, veh/h	1619	3420	1530	1619	1800	1530	1619	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	245	610	370	174	402	67	148	819	91	117	963	101
Grp Sat Flow(s),veh/h/ln	1619	1710	1530	1619	1800	1530	1619	1710	1530	1619	1710	1530
Q Serve(g_s), s	17.8	16.8	24.6	12.7	23.8	3.8	9.5	28.1	5.6	8.5	31.7	6.2
Cycle Q Clear(g_c), s	17.8	16.8	24.6	12.7	23.8	3.8	9.5	28.1	5.6	8.5	31.7	6.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	269	1220	546	194	558	475	128	880	394	139	903	404
V/C Ratio(X)	0.91	0.50	0.68	0.90	0.72	0.14	1.15	0.93	0.23	0.84	1.07	0.25
Avail Cap(c_a), veh/h	329	1220	546	194	558	475	128	880	394	140	903	404
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.83	0.83	0.83	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.1	30.2	32.8	52.1	36.8	29.9	55.3	43.5	35.2	54.0	44.1	34.8
Incr Delay (d2), s/veh	19.7	1.2	5.5	36.2	7.8	0.6	127.0	17.6	1.4	32.4	49.1	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.4	8.1	11.2	7.7	13.0	1.7	8.8	15.3	2.5	5.1	21.1	2.8
LnGrp Delay(d),s/veh	68.9	31.4	38.3	88.3	44.6	30.5	182.3	61.1	36.6	86.4	93.3	36.3
LnGrp LOS	E	C	D	F	D	C	F	E	D	F	F	D
Approach Vol, veh/h		1225			643			1058			1181	
Approach Delay, s/veh		41.0			54.9			76.0			87.7	
Approach LOS		D			D			E			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.0	49.0	14.1	37.9	24.6	43.4	14.9	37.1				
Change Period (Y+Rc), s	4.6	6.2	4.6	6.2	4.6	6.2	4.6	6.2				
Max Green Setting (Gmax), s	14.4	42.8	9.5	31.7	24.4	32.8	10.4	30.8				
Max Q Clear Time (g_c+I1), s	14.7	26.6	11.5	33.7	19.8	25.8	10.5	30.1				
Green Ext Time (p_c), s	0.0	9.3	0.0	0.0	0.1	4.9	0.0	0.6				
Intersection Summary												
HCM 2010 Ctrl Delay			65.6									
HCM 2010 LOS			E									

Intersection

Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗
Traffic Vol, veh/h	4	13	8	936	1435	18
Future Vol, veh/h	4	13	8	936	1435	18
Conflicting Peds, #/hr	0	0	0	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	75	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	5	16	10	1170	1794	23

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2412	910	1818	0	-	0
Stage 1	1807	-	-	-	-	-
Stage 2	605	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	*28	*490	538	-	-	-
Stage 1	*311	-	-	-	-	-
Stage 2	*659	-	-	-	-	-
Platoon blocked, %		1	1	-	-	-
Mov Cap-1 Maneuver	*27	*489	538	-	-	-
Mov Cap-2 Maneuver	*202	-	-	-	-	-
Stage 1	*310	-	-	-	-	-
Stage 2	*646	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.1	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	538	-	202	489	-	-
HCM Lane V/C Ratio	0.019	-	0.025	0.033	-	-
HCM Control Delay (s)	11.8	-	23.3	12.6	-	-
HCM Lane LOS	B	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	0.1	-	-

Notes

-: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Timings
11: Waterman Av. & Driveway 2/Park Center Dr.



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↕		↕	↕	↕	↑↑	↕	↕	↑↑
Traffic Volume (vph)	20	0	21	1	10	76	889	144	57	1073
Future Volume (vph)	20	0	21	1	10	76	889	144	57	1073
Turn Type	Perm	NA	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4		8		5	2		1	6
Permitted Phases	4		8		8	2		2	6	
Detector Phase	4	4	8	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	21.6	21.6	21.6	9.6	23.2	23.2	9.6	33.2
Total Split (s)	21.6	21.6	21.6	21.6	21.6	9.6	32.0	32.0	11.4	33.8
Total Split (%)	33.2%	33.2%	33.2%	33.2%	33.2%	14.8%	49.2%	49.2%	17.5%	52.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		4.6	4.6	4.6	6.2	6.2	4.6	6.2
Lead/Lag						Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)		11.4		11.4	11.4	47.3	44.8	44.8	49.5	41.8
Actuated g/C Ratio		0.18		0.18	0.18	0.73	0.69	0.69	0.76	0.64
v/c Ratio		0.15		0.09	0.03	0.34	0.44	0.14	0.05	0.60
Control Delay		0.9		21.7	0.1	8.6	10.2	3.3	4.1	12.9
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		0.9		21.7	0.1	8.6	10.2	3.3	4.1	12.9
LOS		A		C	A	A	B	A	A	B
Approach Delay		0.9		15.1			9.2			12.5
Approach LOS		A		B			A			B

Intersection Summary

Cycle Length: 65
 Actuated Cycle Length: 65
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.60
 Intersection Signal Delay: 10.8
 Intersection LOS: B
 Intersection Capacity Utilization 59.8%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 11: Waterman Av. & Driveway 2/Park Center Dr.



HCM Signalized Intersection Capacity Analysis
 11: Waterman Av. & Driveway 2/Park Center Dr.

Gateway South Building 4 TIA (JN 10187)






















3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↕	↕	↕	↕↕	
Traffic Volume (vph)	20	0	22	21	1	10	76	889	144	57	1073	50
Future Volume (vph)	20	0	22	21	1	10	76	889	144	57	1073	50
Ideal Flow (vphp)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)		4.6			4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes		1.00			1.00	1.00	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.93			1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.98			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1635			1800	1800	1615	3600	1800	1700	3600	
Flt Permitted		0.83			0.70	1.00	0.13	1.00	1.00	0.22	1.00	
Satd. Flow (perm)		1395			1800	1800	218	3600	1800	1700	3600	
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	25	0	27	26	1	12	94	1098	178	70	1325	62
RTOR Reduction (vph)	0	46	0	0	0	11	0	0	62	0	4	0
Lane Group Flow (vph)	0	6	0	0	27	1	94	1098	116	70	1383	0
Confl. Bikes (#/hr)									2			2
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		7.4			7.4	7.4	43.0	38.6	38.6	41.4	37.8	
Effective Green, g (s)		7.4			7.4	7.4	43.0	38.6	38.6	41.4	37.8	
Actuated g/C Ratio		0.11			0.11	0.11	0.66	0.59	0.59	0.64	0.58	
Clearance Time (s)		4.6			4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Vehicle Extension (s)		3.0			3.0	3.0	2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)		158			204	204	238	2137	1068	1082	2093	
v/s Ratio Prot							c0.03	0.30		0.00	c0.38	
v/s Ratio Perm		0.00			0.01	0.00	0.23		0.06	0.04		
v/c Ratio		0.04			0.13	0.01	0.39	0.51	0.11	0.06	0.66	
Uniform Delay, d1		25.6			25.9	25.5	5.8	7.7	5.7	4.7	9.2	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.1			0.3	0.0	0.4	0.9	0.2	0.0	1.7	
Delay (s)		25.7			26.2	25.6	6.2	8.6	5.9	4.7	10.9	
Level of Service		C			C	C	A	A	A	A	B	
Approach Delay (s)		25.7			26.0			8.1			10.6	
Approach LOS		C			C			A			B	

Intersection Summary

HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	15.4
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	0	22	21	1	10	76	889	144	57	1073	50
Future Volume (veh/h)	20	0	22	21	1	10	76	889	144	57	1073	50
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	25	0	27	26	1	10	94	1098	174	70	1325	62
Adj No. of Lanes	0	1	0	0	1	1	1	2	1	1	2	0
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	148	24	97	283	9	188	323	2000	876	362	1918	90
Arrive On Green	0.12	0.00	0.12	0.12	0.12	0.12	0.06	0.58	0.58	0.06	0.58	0.58
Sat Flow, veh/h	533	199	790	1416	72	1530	1619	3420	1497	1619	3323	155
Grp Volume(v), veh/h	52	0	0	27	0	10	94	1098	174	70	681	706
Grp Sat Flow(s),veh/h/ln	1521	0	0	1487	0	1530	1619	1710	1497	1619	1710	1769
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.4	1.4	12.8	3.5	1.1	18.2	18.3
Cycle Q Clear(g_c), s	1.9	0.0	0.0	0.9	0.0	0.4	1.4	12.8	3.5	1.1	18.2	18.3
Prop In Lane	0.48		0.52	0.96		1.00	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	269	0	0	292	0	188	323	2000	876	362	987	1021
V/C Ratio(X)	0.19	0.00	0.00	0.09	0.00	0.05	0.29	0.55	0.20	0.19	0.69	0.69
Avail Cap(c_a), veh/h	474	0	0	488	0	400	346	2000	876	442	987	1021
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.8	0.0	0.0	25.4	0.0	25.2	7.9	8.2	6.3	6.0	9.6	9.7
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.1	0.0	0.1	0.2	1.1	0.5	0.1	3.9	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	0.4	0.0	0.2	0.6	6.3	1.6	0.5	9.6	9.9
LnGrp Delay(d),s/veh	26.2	0.0	0.0	25.5	0.0	25.3	8.1	9.3	6.8	6.1	13.6	13.5
LnGrp LOS	C			C		C	A	A	A	A	B	B
Approach Vol, veh/h		52			37			1366			1457	
Approach Delay, s/veh		26.2			25.5			8.9			13.2	
Approach LOS		C			C			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.2	44.2		12.6	8.7	43.7		12.6				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	6.8	25.8		17.0	5.0	27.6		17.0				
Max Q Clear Time (g_c+I1), s	3.1	14.8		3.9	3.4	20.3		2.9				
Green Ext Time (p_c), s	0.0	10.3		0.3	0.0	7.0		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay				11.6								
HCM 2010 LOS				B								

Timings

12: Waterman Av./Waterman Av. & Hospitality Ln.

3/27/2017

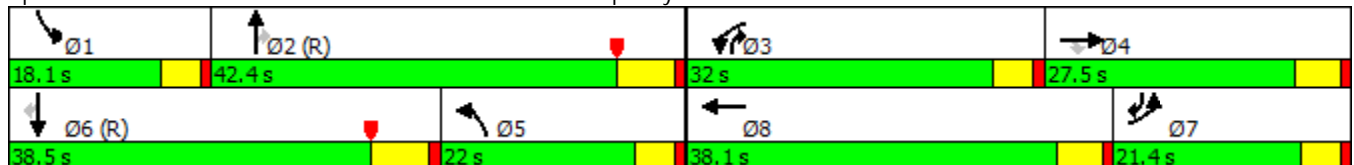


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↗	↗	↗	↘	↗	↘
Traffic Volume (vph)	195	212	168	498	478	365	1126	1051	133	662	179
Future Volume (vph)	195	212	168	498	478	365	1126	1051	133	662	179
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8	5	2	3	1	6	7
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	3	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	15.1	15.1	9.6	38.1	9.6	36.2	9.6	9.6	36.2	9.6
Total Split (s)	21.4	27.5	27.5	32.0	38.1	22.0	42.4	32.0	18.1	38.5	21.4
Total Split (%)	17.8%	22.9%	22.9%	26.7%	31.8%	18.3%	35.3%	26.7%	15.1%	32.1%	17.8%
Yellow Time (s)	3.6	4.1	4.1	3.6	4.1	3.6	5.2	3.6	3.6	5.2	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	5.1	4.6	5.1	4.6	6.2	4.6	4.6	6.2	4.6
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effect Green (s)	17.7	21.2	21.2	24.7	28.1	17.4	41.2	72.0	12.5	36.2	60.2
Actuated g/C Ratio	0.15	0.18	0.18	0.21	0.23	0.14	0.34	0.60	0.10	0.30	0.50
v/c Ratio	0.84	0.44	0.27	0.81	0.80	0.84	0.98	0.49	0.81	0.44	0.20
Control Delay	77.2	42.6	3.8	55.9	47.6	67.4	61.6	9.6	84.6	35.6	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.2	42.6	3.8	55.9	47.6	67.4	61.6	9.6	84.6	35.6	7.8
LOS	E	D	A	E	D	E	E	A	F	D	A
Approach Delay		46.5			51.2		40.9			37.2	
Approach LOS		D			D		D			D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 115
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.98
 Intersection Signal Delay: 43.1
 Intersection LOS: D
 Intersection Capacity Utilization 92.1%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 12: Waterman Av./Waterman Av. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
 12: Waterman Av./Waterman Av. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	195	212	168	498	478	169	365	1126	1051	133	662	179
Future Volume (vph)	195	212	168	498	478	169	365	1126	1051	133	662	179
Ideal Flow (vphpl)	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Lane Util. Factor	1.00	0.91	0.91	0.97	0.95		0.97	0.95	0.88	1.00	0.91	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	0.99		1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	210	228	181	535	514	182	392	1211	1130	143	712	192
RTOR Reduction (vph)	0	17	103	0	31	0	0	0	171	0	0	64
Lane Group Flow (vph)	210	267	22	535	665	0	392	1211	959	143	712	128
Confl. Peds. (#/hr)							9		1			3
Confl. Bikes (#/hr)							2		3			
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4						2			6
Actuated Green, G (s)	17.8	21.2	21.2	24.7	28.1		17.5	41.1	65.8	12.5	36.1	53.9
Effective Green, g (s)	17.8	21.2	21.2	24.7	28.1		17.5	41.1	65.8	12.5	36.1	53.9
Actuated g/C Ratio	0.15	0.18	0.18	0.21	0.23		0.15	0.34	0.55	0.10	0.30	0.45
Clearance Time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	4.0	2.0	2.0	4.0	2.0
Lane Grp Cap (vph)	252	636	318	658	843		466	1233	1974	177	1624	877
v/s Ratio Prot	c0.12	c0.07		0.17	c0.18		0.12	c0.34	0.10	c0.08	0.13	0.02
v/s Ratio Perm			0.01						0.17			0.05
v/c Ratio	0.83	0.42	0.07	0.81	0.79		0.84	0.98	0.49	0.81	0.44	0.15
Uniform Delay, d1	49.7	43.9	41.2	45.4	43.2		49.9	39.1	16.7	52.6	33.8	19.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	19.6	0.4	0.1	7.2	4.9		12.4	21.7	0.1	21.9	0.9	0.0
Delay (s)	69.3	44.4	41.3	52.7	48.1		62.3	60.8	16.8	74.4	34.6	19.5
Level of Service	E	D	D	D	D		E	E	B	E	C	B
Approach Delay (s)		52.2			50.1			42.8			37.3	
Approach LOS		D			D			D			D	

Intersection Summary

HCM 2000 Control Delay	44.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	195	212	168	498	478	169	365	1126	1051	133	662	179
Future Volume (veh/h)	195	212	168	498	478	169	365	1126	1051	133	662	179
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	210	228	107	535	514	167	392	1211	698	143	712	94
Adj No. of Lanes	1	2	1	2	2	0	2	2	2	1	3	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	227	666	283	586	604	195	483	1173	1435	167	1323	625
Arrive On Green	0.14	0.19	0.19	0.20	0.24	0.24	0.16	0.34	0.34	0.10	0.27	0.27
Sat Flow, veh/h	1619	3600	1530	2956	2526	816	2956	3420	2626	1619	4914	1525
Grp Volume(v), veh/h	210	228	107	535	347	334	392	1211	698	143	712	94
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	1710	1632	1478	1710	1313	1619	1638	1525
Q Serve(g_s), s	15.4	6.6	5.0	21.3	23.3	23.5	15.3	41.2	19.9	10.4	14.9	0.0
Cycle Q Clear(g_c), s	15.4	6.6	5.0	21.3	23.3	23.5	15.3	41.2	19.9	10.4	14.9	0.0
Prop In Lane	1.00		1.00	1.00		0.50	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	227	666	283	586	409	390	483	1173	1435	167	1323	625
V/C Ratio(X)	0.93	0.34	0.38	0.91	0.85	0.86	0.81	1.03	0.49	0.86	0.54	0.15
Avail Cap(c_a), veh/h	227	672	286	675	470	449	483	1173	1435	182	1323	625
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.53	0.53	0.53	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.0	42.5	20.0	47.1	43.6	43.7	48.4	39.4	17.2	53.0	37.5	22.3
Incr Delay (d2), s/veh	39.5	0.3	0.8	8.7	7.1	7.8	9.4	34.8	1.2	27.7	1.6	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.4	3.3	2.2	9.4	11.8	11.4	6.9	25.1	7.4	6.0	6.9	2.0
LnGrp Delay(d),s/veh	90.5	42.8	20.9	55.8	50.7	51.5	57.8	74.3	18.4	80.7	39.1	22.8
LnGrp LOS	F	D	C	E	D	D	E	F	B	F	D	C
Approach Vol, veh/h		545			1216			2301			949	
Approach Delay, s/veh		56.9			53.2			54.5			43.7	
Approach LOS		E			D			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.9	47.4	28.4	27.3	25.8	38.5	21.9	33.8				
Change Period (Y+Rc), s	4.6	6.2	4.6	5.1	6.2	* 6.2	5.1	* 5.1				
Max Green Setting (Gmax), s	13.5	36.2	27.4	22.4	17.4	* 32	16.8	* 33				
Max Q Clear Time (g_c+I1), s	12.4	43.2	23.3	8.6	17.3	16.9	17.4	25.5				
Green Ext Time (p_c), s	0.0	0.0	0.5	1.7	0.0	5.6	0.0	2.5				
Intersection Summary												
HCM 2010 Ctrl Delay			52.4									
HCM 2010 LOS			D									
Notes												

Intersection

Int Delay, s/veh 1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↖ ↗	↖ ↗	↖ ↗	
Traffic Vol, veh/h	0	0	363	2542	1481	195
Future Vol, veh/h	0	0	363	2542	1481	195
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	0	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	378	2648	1543	203

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	771	1543 0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	7.1	5.3 -
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.9	3.1 -
Pot Cap-1 Maneuver	0	*594	*747 -
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	1	1 -
Mov Cap-1 Maneuver	-	*594	*747 -
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	1.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	* 747	-	-	-	-
HCM Lane V/C Ratio	0.506	-	-	-	-
HCM Control Delay (s)	14.7	-	0	-	-
HCM Lane LOS	B	-	A	-	-
HCM 95th %tile Q(veh)	2.9	-	-	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations						↗		↑↑			↑↑	
Traffic Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Future Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	-	-	-	Free	-	-	-	-	-	None
Storage Length	-	-	-	-	-	0	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	1209	0	998	0	0	746	171

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	-	-	-	-	0	-	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	0	0	-	0	0	-	0
Stage 1	0	0	0	0	-	0	0	-	0
Stage 2	0	0	0	0	-	0	0	-	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBTWBLn1	SBT	SBR
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	-	0	-
HCM Lane LOS	-	A	-
HCM 95th %tile Q(veh)	-	-	-

Intersection

Int Delay, s/veh

Movement	NWL	NWR
Lane Configurations		
Traffic Vol, veh/h	0	0
Future Vol, veh/h	0	0
Conflicting Peds, #/hr	0	0
Sign Control	Stop	Stop
RT Channelized	-	-
Storage Length	-	-
Veh in Median Storage, #	0	-
Grade, %	0	-
Peak Hour Factor	95	95
Heavy Vehicles, %	0	0
Mvmt Flow	0	0

Major/Minor

Conflicting Flow All

Stage 1

Stage 2

Critical Hdwy

Critical Hdwy Stg 1

Critical Hdwy Stg 2

Follow-up Hdwy

Pot Cap-1 Maneuver

Stage 1

Stage 2

Platoon blocked, %

Mov Cap-1 Maneuver

Mov Cap-2 Maneuver

Stage 1

Stage 2

Approach

HCM Control Delay, s

HCM LOS

Minor Lane/Major Mvmt

Timings

15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.

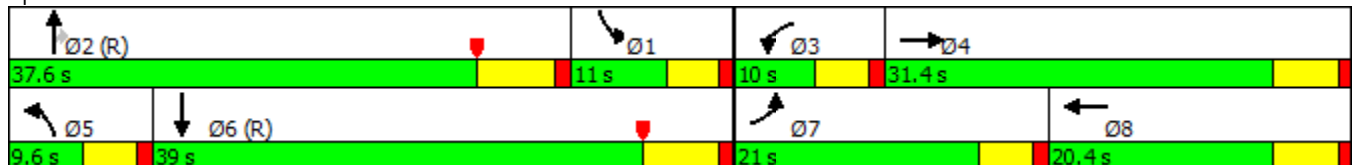


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖↗	↕	↖	↕	↖	↕	↗	↖	↕
Traffic Volume (vph)	629	616	128	272	70	1025	186	302	704
Future Volume (vph)	629	616	128	272	70	1025	186	302	704
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	9.6	31.4	9.6	15.4	9.6	36.2	36.2	9.6	36.2
Total Split (s)	21.0	31.4	10.0	20.4	9.6	37.6	37.6	11.0	39.0
Total Split (%)	23.3%	34.9%	11.1%	22.7%	10.7%	41.8%	41.8%	12.2%	43.3%
Yellow Time (s)	3.6	4.4	3.6	4.4	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	5.4	4.6	6.2	6.2	4.6	6.2
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)	16.4	25.2	5.4	14.2	5.1	32.2	32.2	6.4	35.5
Actuated g/C Ratio	0.18	0.28	0.06	0.16	0.06	0.36	0.36	0.07	0.39
v/c Ratio	1.12	0.88	1.30	0.73	0.76	0.83	0.25	2.62	0.72
Control Delay	111.8	38.7	227.9	33.1	87.2	33.5	3.1	774.9	25.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	111.8	38.7	227.9	33.1	87.2	33.5	3.1	774.9	25.2
LOS	F	D	F	C	F	C	A	F	C
Approach Delay		68.8		74.2		32.0			197.3
Approach LOS		E		E		C			F

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 2.63
 Intersection Signal Delay: 95.3
 Intersection LOS: F
 Intersection Capacity Utilization 102.1%
 ICU Level of Service G
 Analysis Period (min) 15

Splits and Phases: 15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.

























HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 15: Waterman Av./Waterman Av. & Redlands Bl./Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔	↕↔		↔	↕↕	↔	↔	↕↔	
Traffic Volume (vph)	629	616	280	128	272	205	70	1025	186	302	704	311
Future Volume (vph)	629	616	280	128	272	205	70	1025	186	302	704	311
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.94		1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Flt Permitted	1.00	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	655	642	292	133	283	214	73	1068	194	315	733	324
RTOR Reduction (vph)	0	59	0	0	112	0	0	0	127	0	54	0
Lane Group Flow (vph)	655	875	0	133	385	0	73	1068	67	315	1003	0
Confl. Peds. (#/hr)			3						1			4
Confl. Bikes (#/hr)			1						1			
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	16.4	25.2		5.4	14.2		4.0	31.3	31.3	7.3	34.6	
Effective Green, g (s)	16.4	25.2		5.4	14.2		4.0	31.3	31.3	7.3	34.6	
Actuated g/C Ratio	0.18	0.28		0.06	0.16		0.04	0.35	0.35	0.08	0.38	
Clearance Time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	583	1008		102	568		75	1252	626	137	1384	
v/s Ratio Prot	c0.20	c0.24		0.08	0.11		0.04	c0.30		c0.19	0.28	
v/s Ratio Perm									0.04			
v/c Ratio	1.12	0.87		1.30	0.68		0.97	0.85	0.11	2.30	0.72	
Uniform Delay, d1	36.8	30.8		42.3	35.7		42.9	27.2	19.9	41.4	23.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	76.1	8.0		191.0	3.2		93.9	7.5	0.3	607.1	3.3	
Delay (s)	112.9	38.8		233.3	39.0		136.8	34.7	20.2	648.4	27.0	
Level of Service	F	D		F	D		F	C	C	F	C	
Approach Delay (s)		69.4			80.0			38.2			169.6	
Approach LOS		E			E			D			F	

Intersection Summary		
HCM 2000 Control Delay	90.2	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.10	F
Actuated Cycle Length (s)	90.0	Sum of lost time (s)
Intersection Capacity Utilization	102.1%	ICU Level of Service
Analysis Period (min)	15	G

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	629	616	280	128	272	205	70	1025	186	302	704	311
Future Volume (veh/h)	629	616	280	128	272	205	70	1025	186	302	704	311
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	655	642	238	133	283	189	73	1068	152	315	733	269
Adj No. of Lanes	2	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	539	702	260	97	331	215	90	1193	527	1046	2345	861
Arrive On Green	0.18	0.29	0.29	0.06	0.17	0.17	0.06	0.35	0.35	0.65	0.96	0.96
Sat Flow, veh/h	2956	2433	901	1619	1991	1291	1619	3420	1509	1619	2451	899
Grp Volume(v), veh/h	655	451	429	133	242	230	73	1068	152	315	511	491
Grp Sat Flow(s),veh/h/ln	1478	1710	1624	1619	1710	1572	1619	1710	1509	1619	1710	1640
Q Serve(g_s), s	16.4	22.9	23.0	5.4	12.4	12.9	4.0	26.6	10.7	7.7	1.7	1.7
Cycle Q Clear(g_c), s	16.4	22.9	23.0	5.4	12.4	12.9	4.0	26.6	10.7	7.7	1.7	1.7
Prop In Lane	1.00		0.55	1.00		0.82	1.00		1.00	1.00		0.55
Lane Grp Cap(c), veh/h	539	493	469	97	284	261	90	1193	527	1046	1636	1569
V/C Ratio(X)	1.22	0.91	0.92	1.37	0.85	0.88	0.81	0.90	0.29	0.30	0.31	0.31
Avail Cap(c_a), veh/h	539	494	469	97	285	262	90	1193	527	1046	1636	1569
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.65	0.65	0.65	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.8	30.9	31.0	42.3	36.4	36.6	42.0	27.7	56.6	7.0	0.1	0.1
Incr Delay (d2), s/veh	108.1	15.6	16.3	218.4	21.0	27.2	38.7	10.5	1.4	0.1	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.7	12.9	12.4	8.3	7.5	7.5	2.8	14.2	4.7	3.4	0.9	0.9
LnGrp Delay(d),s/veh	144.9	46.5	47.3	260.7	57.4	63.8	80.7	38.3	58.0	7.1	0.6	0.6
LnGrp LOS	F	D	D	F	E	E	F	D	E	A	A	A
Approach Vol, veh/h		1535			605			1293			1317	
Approach Delay, s/veh		88.7			104.5			43.0			2.2	
Approach LOS		F			F			D			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	65.9	37.6	10.0	31.4	9.6	93.9	21.0	20.4				
Change Period (Y+Rc), s	6.2	* 6.2	4.6	5.4	4.6	6.2	4.6	5.4				
Max Green Setting (Gmax), s	6.4	* 31	5.4	26.0	5.0	32.8	16.4	15.0				
Max Q Clear Time (g_c+I1), s	9.7	28.6	7.4	25.0	6.0	3.7	18.4	14.9				
Green Ext Time (p_c), s	0.0	2.1	0.0	0.8	0.0	9.9	0.0	0.1				
Intersection Summary												
HCM 2010 Ctrl Delay			54.3									
HCM 2010 LOS			D									
Notes												

Timings
16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

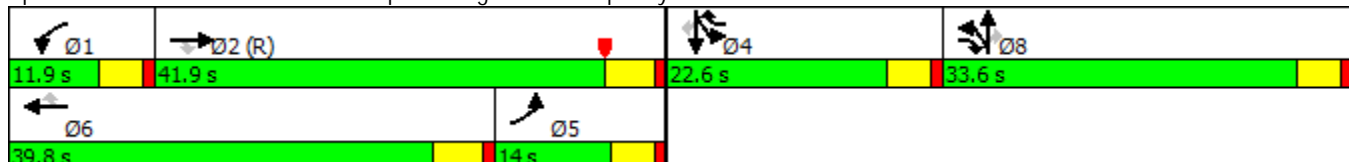


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘↗	↑↑	↗	↘	↑↑	↗	↘	↑↑	↗
Traffic Volume (vph)	128	207	85	60	120	730	442	907	228	9	741	133
Future Volume (vph)	128	207	85	60	120	730	442	907	228	9	741	133
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	8	1	6	4	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	39.1	33.6	9.6	39.1	22.6	33.6	33.6	33.6	22.6	22.6	22.6
Total Split (s)	14.0	41.9	33.6	11.9	39.8	22.6	33.6	33.6	33.6	22.6	22.6	22.6
Total Split (%)	12.7%	38.1%	30.5%	10.8%	36.2%	20.5%	30.5%	30.5%	30.5%	20.5%	20.5%	20.5%
Yellow Time (s)	3.6	4.1	3.6	3.6	4.1	3.6	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lag	Lag		Lead	Lead							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	C-Max	Max	None	None	Max	Max	Max	Max	Max	Max	Max
Act Effect Green (s)	28.8	39.7	70.1	6.4	15.3	33.8	29.0	29.0	29.0	18.0	18.0	18.0
Actuated g/C Ratio	0.26	0.36	0.64	0.06	0.14	0.31	0.26	0.26	0.26	0.16	0.16	0.16
v/c Ratio	0.30	0.16	0.07	0.33	0.60	0.79	0.91	1.02	0.39	0.03	1.28	0.32
Control Delay	38.5	25.3	1.2	54.4	13.4	27.6	64.8	75.7	12.9	39.2	178.4	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.5	25.3	1.2	54.4	13.4	27.6	64.8	75.7	12.9	39.2	178.4	5.8
LOS	D	C	A	D	B	C	E	E	B	D	F	A
Approach Delay		24.4			21.8			63.8			151.0	
Approach LOS		C			C			E			F	

Intersection Summary

Cycle Length: 110
 Actuated Cycle Length: 110
 Offset: 0 (0%), Referenced to phase 2:EBT, Start of Yellow
 Natural Cycle: 125
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.28
 Intersection Signal Delay: 69.7
 Intersection LOS: E
 Intersection Capacity Utilization 96.5%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)

3/30/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	128	207	85	60	120	730	442	907	228	9	741	133
Future Volume (vph)	128	207	85	60	120	730	442	907	228	9	741	133
Ideal Flow (vphpl)	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lane Util. Factor	1.00	0.95	1.00	0.97	0.91	0.91	0.91	0.91	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.89	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600	1384	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600	1384	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	131	211	87	61	122	745	451	926	233	9	756	136
RTOR Reduction (vph)	0	0	33	0	325	47	0	0	120	0	0	114
Lane Group Flow (vph)	131	211	54	61	170	325	406	971	113	9	756	22
Confl. Peds. (#/hr)			2			1						
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	29.8	38.7	67.7	5.4	14.3	32.3	29.0	29.0	29.0	18.0	18.0	18.0
Effective Green, g (s)	29.8	38.7	67.7	5.4	14.3	32.3	29.0	29.0	29.0	18.0	18.0	18.0
Actuated g/C Ratio	0.27	0.35	0.62	0.05	0.13	0.29	0.26	0.26	0.26	0.16	0.16	0.16
Clearance Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	460	1266	1107	157	468	406	448	949	474	278	589	294
v/s Ratio Prot	c0.08	0.06	0.01	0.02	0.05	c0.13	0.24	c0.27		0.01	c0.21	
v/s Ratio Perm			0.02			0.10			0.06			0.01
v/c Ratio	0.28	0.17	0.05	0.39	0.36	0.80	0.91	1.02	0.24	0.03	1.28	0.08
Uniform Delay, d1	31.7	24.5	8.4	50.7	43.7	35.9	39.2	40.5	31.8	38.7	46.0	39.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.3	0.1	0.6	0.5	10.9	24.6	35.2	1.2	0.2	140.2	0.5
Delay (s)	31.8	24.8	8.5	51.3	44.2	46.7	63.7	75.7	33.0	38.9	186.2	39.5
Level of Service	C	C	A	D	D	D	E	E	C	D	F	D
Approach Delay (s)		23.6			45.7			66.5			162.6	
Approach LOS		C			D			E			F	

























Intersection Summary			
HCM 2000 Control Delay	79.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.9
Intersection Capacity Utilization	96.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)

3/30/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	128	207	85	60	120	730	442	907	228	9	741	133
Future Volume (veh/h)	128	207	85	60	120	730	442	907	228	9	741	133
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	131	211	70	61	122	733	451	926	193	9	756	118
Adj No. of Lanes	1	2	1	2	1	2	1	2	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	255	1240	950	117	430	1230	427	949	403	265	560	250
Arrive On Green	0.16	0.36	0.36	0.04	0.24	0.24	0.26	0.26	0.26	0.16	0.16	0.16
Sat Flow, veh/h	1619	3420	1508	3048	1800	3054	1619	3600	1530	1619	3420	1530
Grp Volume(v), veh/h	131	211	70	61	122	733	451	926	193	9	756	118
Grp Sat Flow(s),veh/h/ln	1619	1710	1508	1524	1800	1527	1619	1800	1530	1619	1710	1530
Q Serve(g_s), s	8.2	4.6	2.0	2.2	6.1	20.8	29.0	28.1	11.7	0.5	18.0	7.7
Cycle Q Clear(g_c), s	8.2	4.6	2.0	2.2	6.1	20.8	29.0	28.1	11.7	0.5	18.0	7.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	255	1240	950	117	430	1230	427	949	403	265	560	250
V/C Ratio(X)	0.51	0.17	0.07	0.52	0.28	0.60	1.06	0.98	0.48	0.03	1.35	0.47
Avail Cap(c_a), veh/h	255	1240	950	202	568	1464	427	949	403	265	560	250
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.85	0.85	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.5	23.8	8.1	51.9	34.2	25.8	40.5	40.2	34.1	38.7	46.0	41.7
Incr Delay (d2), s/veh	0.7	0.3	0.1	1.3	0.4	0.5	59.3	23.9	4.0	0.2	169.4	6.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	2.2	1.5	0.9	3.1	11.2	20.0	17.0	5.4	0.2	21.6	3.7
LnGrp Delay(d),s/veh	43.2	24.1	8.2	53.2	34.5	26.3	99.8	64.0	38.2	38.9	215.4	47.9
LnGrp LOS	D	C	A	D	C	C	F	E	D	D	F	D
Approach Vol, veh/h		412			916			1570			883	
Approach Delay, s/veh		27.4			29.2			71.1			191.3	
Approach LOS		C			C			E			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.8	45.0		22.6	22.4	31.4		33.6				
Change Period (Y+Rc), s	4.6	5.1		4.6	5.1	* 5.1		4.6				
Max Green Setting (Gmax), s	7.3	36.8		18.0	9.4	* 35		29.0				
Max Q Clear Time (g_c+I1), s	4.2	6.6		20.0	10.2	22.8		31.0				
Green Ext Time (p_c), s	0.0	1.6		0.0	0.0	3.2		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			84.3									
HCM 2010 LOS			F									
Notes												

Timings
1: I-215 SB Ramps & Auto Center Rd.

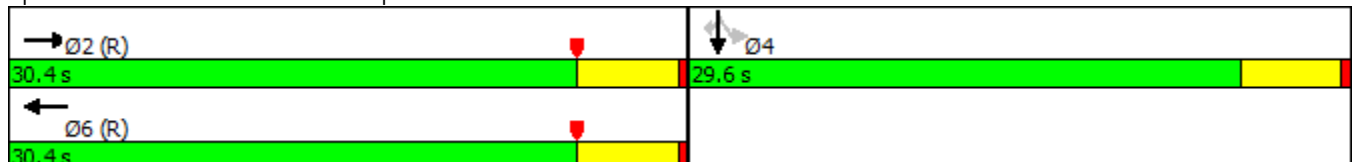


Lane Group	EBT	WBT	SBL	SBT	SBR
Lane Configurations	↑↑	↑↑	↘	↙	↗
Traffic Volume (vph)	458	528	873	91	178
Future Volume (vph)	458	528	873	91	178
Turn Type	NA	NA	Perm	NA	Perm
Protected Phases	2	6		4	
Permitted Phases			4		4
Detector Phase	2	6	4	4	4
Switch Phase					
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	30.0	22.5	22.5	22.5	22.5
Total Split (s)	30.4	30.4	29.6	29.6	29.6
Total Split (%)	50.7%	50.7%	49.3%	49.3%	49.3%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	Max	Max	Max
Act Effct Green (s)	25.4	25.4	24.6	24.6	24.6
Actuated g/C Ratio	0.42	0.42	0.41	0.41	0.41
v/c Ratio	0.45	0.36	0.72	0.68	0.22
Control Delay	9.3	6.5	22.2	20.3	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	9.3	6.5	22.2	20.3	2.9
LOS	A	A	C	C	A
Approach Delay	9.3	6.5		18.4	
Approach LOS	A	A		B	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 50 (83%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.72
 Intersection Signal Delay: 13.0
 Intersection LOS: B
 Intersection Capacity Utilization 58.5%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 1: I-215 SB Ramps & Auto Center Rd.



HCM Signalized Intersection Capacity Analysis
1: I-215 SB Ramps & Auto Center Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑					↘	↙	↗
Traffic Volume (vph)	0	458	257	0	528	0	0	0	0	873	91	178
Future Volume (vph)	0	458	257	0	528	0	0	0	0	873	91	178
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		5.0			5.0					5.0	5.0	5.0
Lane Util. Factor		0.95			0.95					0.95	0.95	1.00
Frbp, ped/bikes		0.99			1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00			1.00					1.00	1.00	1.00
Frt		0.95			1.00					1.00	1.00	0.85
Flt Protected		1.00			1.00					0.95	0.96	1.00
Satd. Flow (prot)		3600			3600					1700	1800	1800
Flt Permitted		1.00			1.00					0.95	0.96	1.00
Satd. Flow (perm)		3600			3600					1700	1800	1800
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	477	268	0	550	0	0	0	0	909	95	185
RTOR Reduction (vph)	0	130	0	0	0	0	0	0	0	0	0	109
Lane Group Flow (vph)	0	615	0	0	550	0	0	0	0	500	504	76
Confl. Peds. (#/hr)			1									
Confl. Bikes (#/hr)			1									
Turn Type		NA			NA					Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases										4		4
Actuated Green, G (s)		25.4			25.4					24.6	24.6	24.6
Effective Green, g (s)		25.4			25.4					24.6	24.6	24.6
Actuated g/C Ratio		0.42			0.42					0.41	0.41	0.41
Clearance Time (s)		5.0			5.0					5.0	5.0	5.0
Vehicle Extension (s)		3.0			3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1524			1524					697	738	738
v/s Ratio Prot		c0.17			0.15							
v/s Ratio Perm										c0.29	0.28	0.04
v/c Ratio		0.40			0.36					0.72	0.68	0.10
Uniform Delay, d1		12.0			11.8					14.8	14.5	10.9
Progression Factor		1.00			0.53					1.00	1.00	1.00
Incremental Delay, d2		0.8			0.2					6.2	5.1	0.3
Delay (s)		12.8			6.5					21.0	19.6	11.2
Level of Service		B			A					C	B	B
Approach Delay (s)		12.8			6.5			0.0			18.9	
Approach LOS		B			A			A			B	













Intersection Summary			
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
1: I-215 SB Ramps & Auto Center Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	458	257	0	528	0	0	0	0	873	91	178
Future Volume (veh/h)	0	458	257	0	528	0	0	0	0	873	91	178
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	0	1800	0				1700	1800	1800
Adj Flow Rate, veh/h	0	477	217	0	550	0				977	0	64
Adj No. of Lanes	0	2	0	0	2	0				2	0	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0				0	0	0
Cap, veh/h	0	963	435	0	1448	0				1328	0	627
Arrive On Green	0.00	0.42	0.42	0.00	0.85	0.00				0.41	0.00	0.41
Sat Flow, veh/h	0	2364	1027	0	3600	0				3238	0	1530
Grp Volume(v), veh/h	0	358	336	0	550	0				977	0	64
Grp Sat Flow(s),veh/h/ln	0	1710	1592	0	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	9.2	9.3	0.0	2.2	0.0				15.3	0.0	1.5
Cycle Q Clear(g_c), s	0.0	9.2	9.3	0.0	2.2	0.0				15.3	0.0	1.5
Prop In Lane	0.00		0.65	0.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	724	674	0	1448	0				1328	0	627
V/C Ratio(X)	0.00	0.49	0.50	0.00	0.38	0.00				0.74	0.00	0.10
Avail Cap(c_a), veh/h	0	724	674	0	1448	0				1328	0	627
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	12.6	12.6	0.0	2.8	0.0				15.0	0.0	10.9
Incr Delay (d2), s/veh	0.0	2.4	2.6	0.0	0.8	0.0				3.7	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.8	4.5	0.0	1.1	0.0				7.5	0.0	0.7
LnGrp Delay(d),s/veh	0.0	15.0	15.3	0.0	3.6	0.0				18.6	0.0	11.2
LnGrp LOS		B	B		A					B		B
Approach Vol, veh/h		694			550						1041	
Approach Delay, s/veh		15.1			3.6						18.2	
Approach LOS		B			A						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		30.4		29.6		30.4						
Change Period (Y+Rc), s		5.0		5.0		5.0						
Max Green Setting (Gmax), s		25.4		24.6		25.4						
Max Q Clear Time (g_c+I1), s		11.3		17.3		4.2						
Green Ext Time (p_c), s		6.5		2.5		8.0						
Intersection Summary												
HCM 2010 Ctrl Delay			13.7									
HCM 2010 LOS			B									
Notes												

Timings

2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.

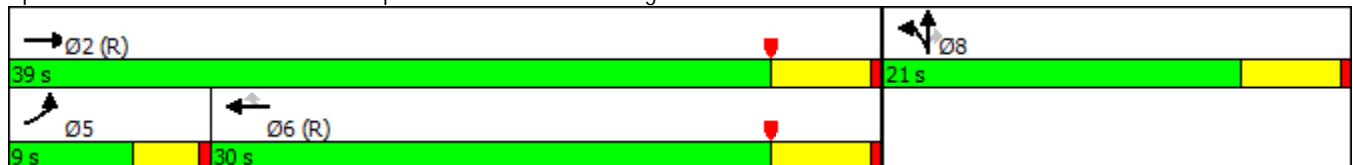


Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations	↶	↷	↷	↷	↶	↷	↷
Traffic Volume (vph)	198	1133	1553	856	105	93	778
Future Volume (vph)	198	1133	1553	856	105	93	778
Turn Type	Prot	NA	NA	Perm	Split	NA	Perm
Protected Phases	5	2	6		8	8	
Permitted Phases				6			8
Detector Phase	5	2	6	6	8	8	8
Switch Phase							
Minimum Initial (s)	5.0	8.0	8.0	8.0	5.0	5.0	5.0
Minimum Split (s)	8.5	39.0	13.0	13.0	10.0	10.0	10.0
Total Split (s)	9.0	39.0	30.0	30.0	21.0	21.0	21.0
Total Split (%)	15.0%	65.0%	50.0%	50.0%	35.0%	35.0%	35.0%
Yellow Time (s)	3.0	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag	Lag			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max
Act Effect Green (s)	5.5	34.0	25.0	25.0	16.0	16.0	16.0
Actuated g/C Ratio	0.09	0.57	0.42	0.42	0.27	0.27	0.27
v/c Ratio	1.30	0.57	1.06	0.82	0.21	0.22	0.75
Control Delay	197.8	5.3	49.2	9.9	18.7	18.7	22.4
Queue Delay	0.0	0.1	0.0	0.5	0.0	0.0	0.2
Total Delay	197.8	5.4	49.2	10.5	18.7	18.7	22.6
LOS	F	A	D	B	B	B	C
Approach Delay		34.0	35.4			21.8	
Approach LOS		C	D			C	

Intersection Summary

Cycle Length: 60
 Actuated Cycle Length: 60
 Offset: 43 (72%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.30
 Intersection Signal Delay: 32.2
 Intersection LOS: C
 Intersection Capacity Utilization 85.5%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.




























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↑↑			↑↑	↗	↙	↖	↗↗			
Traffic Volume (vph)	198	1133	0	0	1553	856	105	93	778	0	0	0
Future Volume (vph)	198	1133	0	0	1553	856	105	93	778	0	0	0
Ideal Flow (vphpl)	1700	1800	1800	1800	1800	1800	1700	1800	1800	1800	1800	1800
Total Lost time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	0.88			
Frbp, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Frt	1.00	1.00			1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	1700	3600			3600	1800	1700	1800	3600			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	1700	3600			3600	1800	1700	1800	3600			
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	202	1156	0	0	1585	873	107	95	794	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	309	0	0	92	0	0	0
Lane Group Flow (vph)	202	1156	0	0	1585	564	96	106	702	0	0	0
Confl. Peds. (#/hr)			1									
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases						6			8			
Actuated Green, G (s)	5.5	34.0			25.0	25.0	16.0	16.0	16.0			
Effective Green, g (s)	5.5	34.0			25.0	25.0	16.0	16.0	16.0			
Actuated g/C Ratio	0.09	0.57			0.42	0.42	0.27	0.27	0.27			
Clearance Time (s)	3.5	5.0			5.0	5.0	5.0	5.0	5.0			
Vehicle Extension (s)	2.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	155	2040			1500	750	453	480	960			
v/s Ratio Prot	c0.12	0.32			c0.44		0.06	0.06				
v/s Ratio Perm						0.31			c0.19			
v/c Ratio	1.30	0.57			1.06	0.75	0.21	0.22	0.73			
Uniform Delay, d1	27.2	8.3			17.5	14.9	17.1	17.1	20.0			
Progression Factor	1.02	0.52			0.96	1.33	1.00	1.00	1.00			
Incremental Delay, d2	168.4	0.9			30.1	1.8	1.1	1.1	4.9			
Delay (s)	196.0	5.2			47.0	21.5	18.2	18.2	24.9			
Level of Service	F	A			D	C	B	B	C			
Approach Delay (s)		33.6			38.0			23.6			0.0	
Approach LOS		C			D			C			A	

Intersection Summary

HCM 2000 Control Delay	33.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	85.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 	 			
Traffic Volume (veh/h)	198	1133	0	0	1553	856	105	93	778	0	0	0
Future Volume (veh/h)	198	1133	0	0	1553	856	105	93	778	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1700	1800	0	0	1800	1800	1700	1800	1800			
Adj Flow Rate, veh/h	202	1156	0	0	1585	669	101	103	460			
Adj No. of Lanes	1	2	0	0	2	1	1	1	2			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	148	1938	0	0	1425	637	432	480	816			
Arrive On Green	0.09	0.57	0.00	0.00	0.28	0.28	0.27	0.27	0.27			
Sat Flow, veh/h	1619	3510	0	0	3510	1530	1619	1800	3060			
Grp Volume(v), veh/h	202	1156	0	0	1585	669	101	103	460			
Grp Sat Flow(s),veh/h/ln	1619	1710	0	0	1710	1530	1619	1800	1530			
Q Serve(g_s), s	5.5	13.3	0.0	0.0	25.0	25.0	2.9	2.7	7.8			
Cycle Q Clear(g_c), s	5.5	13.3	0.0	0.0	25.0	25.0	2.9	2.7	7.8			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	148	1938	0	0	1425	637	432	480	816			
V/C Ratio(X)	1.36	0.60	0.00	0.00	1.11	1.05	0.23	0.21	0.56			
Avail Cap(c_a), veh/h	148	1938	0	0	1425	637	432	480	816			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	0.67	0.67	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.09	0.09	1.00	1.00	1.00			
Uniform Delay (d), s/veh	27.3	8.5	0.0	0.0	21.6	21.6	17.2	17.1	19.0			
Incr Delay (d2), s/veh	199.7	1.4	0.0	0.0	51.6	26.7	1.3	1.0	2.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	10.7	6.5	0.0	0.0	22.0	15.2	1.4	1.5	3.6			
LnGrp Delay(d),s/veh	226.9	9.9	0.0	0.0	73.3	48.4	18.5	18.1	21.8			
LnGrp LOS	F	A			F	F	B	B	C			
Approach Vol, veh/h		1358			2254			664				
Approach Delay, s/veh		42.2			65.9			20.7				
Approach LOS		D			E			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		39.0			9.0	30.0		21.0				
Change Period (Y+Rc), s		5.0			3.5	5.0		5.0				
Max Green Setting (Gmax), s		34.0			5.5	25.0		16.0				
Max Q Clear Time (g_c+I1), s		15.3			7.5	27.0		9.8				
Green Ext Time (p_c), s		17.1			0.0	0.0		1.5				
Intersection Summary												
HCM 2010 Ctrl Delay				51.3								
HCM 2010 LOS				D								
Notes												

Timings
3: E St. & Orange Show Rd.

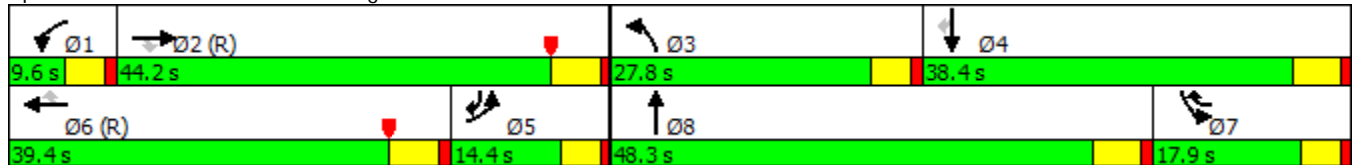


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑	↗	↔↔	↑↑	↗	↖	↑↑	↔↔	↑↑	↗
Traffic Volume (vph)	318	1071	434	252	1217	200	402	483	190	389	437
Future Volume (vph)	318	1071	434	252	1217	200	402	483	190	389	437
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8	7	4	5
Permitted Phases			2			6					4
Detector Phase	5	2	2	1	6	7	3	8	7	4	5
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0
Minimum Split (s)	9.6	39.4	39.4	9.6	39.4	9.6	9.6	38.4	9.6	38.4	9.6
Total Split (s)	14.4	44.2	44.2	9.6	39.4	17.9	27.8	48.3	17.9	38.4	14.4
Total Split (%)	12.0%	36.8%	36.8%	8.0%	32.8%	14.9%	23.2%	40.3%	14.9%	32.0%	12.0%
Yellow Time (s)	3.6	4.4	4.4	3.6	4.4	3.6	3.6	4.4	3.6	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4	4.6	5.4	4.6
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	Max	None	Max	None
Act Effect Green (s)	9.8	38.8	38.8	5.0	34.0	52.7	23.2	42.9	13.3	33.0	43.6
Actuated g/C Ratio	0.08	0.32	0.32	0.04	0.28	0.44	0.19	0.36	0.11	0.28	0.36
v/c Ratio	1.27	0.96	0.54	1.98	1.24	0.24	1.36	0.51	0.56	0.41	0.63
Control Delay	186.7	56.9	10.6	495.4	155.1	10.2	217.9	29.9	57.2	37.1	19.5
Queue Delay	0.0	4.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	186.7	61.7	10.9	495.4	155.1	10.2	217.9	29.9	57.2	37.1	19.5
LOS	F	E	B	F	F	B	F	C	E	D	B
Approach Delay		71.4			189.2			102.0		33.3	
Approach LOS		E			F			F		C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 108 (90%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.98
 Intersection Signal Delay: 105.6
 Intersection LOS: F
 Intersection Capacity Utilization 116.9%
 ICU Level of Service H
 Analysis Period (min) 15

Splits and Phases: 3: E St. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 3: E St. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

























3/27/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	318	1071	434	252	1217	200	402	483	164	190	389	437
Future Volume (vph)	318	1071	434	252	1217	200	402	483	164	190	389	437
Ideal Flow (vphp)	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Total Lost time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95		0.97	0.95	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3200	3600	1800	3200	3600	1800	1600	3600		3200	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3200	3600	1800	3200	3600	1800	1600	3600		3200	3600	1800
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	331	1116	452	262	1268	208	419	503	171	198	405	455
RTOR Reduction (vph)	0	0	254	0	0	68	0	28	0	0	0	68
Lane Group Flow (vph)	331	1116	198	263	1268	140	419	646	0	198	405	387
Confl. Peds. (#/hr)									2			2
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6	7	3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	9.8	38.8	38.8	5.0	34.0	47.3	23.2	42.9		13.3	33.0	42.8
Effective Green, g (s)	9.8	38.8	38.8	5.0	34.0	47.3	23.2	42.9		13.3	33.0	42.8
Actuated g/C Ratio	0.08	0.32	0.32	0.04	0.28	0.39	0.19	0.36		0.11	0.28	0.36
Clearance Time (s)	4.6	5.4	5.4	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	2.0	2.0	3.0		2.0	3.0	2.0
Lane Grp Cap (vph)	261	1164	582	133	1020	778	309	1287		354	990	642
v/s Ratio Prot	c0.10	0.31		c0.08	c0.35	0.02	c0.26	0.18		0.06	0.11	c0.05
v/s Ratio Perm			0.11			0.06						0.17
v/c Ratio	1.27	0.96	0.34	1.98	1.24	0.18	1.36	0.50		0.56	0.41	0.60
Uniform Delay, d1	55.1	39.8	30.9	57.5	43.0	23.7	48.4	30.2		50.6	35.5	31.6
Progression Factor	1.02	1.04	1.40	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	141.8	15.1	1.2	465.7	117.8	0.0	179.9	1.4		1.1	1.3	1.1
Delay (s)	198.0	56.7	44.3	523.2	160.8	23.7	228.3	31.6		51.7	36.8	32.7
Level of Service	F	E	D	F	F	C	F	C		D	D	C
Approach Delay (s)		78.4			199.2			107.0			37.8	
Approach LOS		E			F			F			D	
Intersection Summary												
HCM 2000 Control Delay			112.7	HCM 2000 Level of Service				F				
HCM 2000 Volume to Capacity ratio			1.07									
Actuated Cycle Length (s)			120.0	Sum of lost time (s)				20.0				
Intersection Capacity Utilization			116.9%	ICU Level of Service				H				
Analysis Period (min)			15									
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary
 3: E St. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	318	1071	434	252	1217	200	402	483	164	190	389	437
Future Volume (veh/h)	318	1071	434	252	1217	200	402	483	164	190	389	437
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1600	1800	1800	1600	1800	1800	1600	1800	1800
Adj Flow Rate, veh/h	331	1116	276	262	1268	152	419	503	140	198	405	348
Adj No. of Lanes	2	2	1	2	2	1	1	2	0	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	867	1852	829	123	969	593	295	946	262	308	940	869
Arrive On Green	0.59	1.00	1.00	0.04	0.28	0.28	0.19	0.36	0.36	0.10	0.28	0.28
Sat Flow, veh/h	2956	3420	1530	2956	3420	1530	1524	2647	733	2956	3420	1527
Grp Volume(v), veh/h	331	1116	276	262	1268	152	419	324	319	198	405	348
Grp Sat Flow(s),veh/h/ln	1478	1710	1530	1478	1710	1530	1524	1710	1669	1478	1710	1527
Q Serve(g_s), s	7.2	0.0	0.0	5.0	34.0	0.0	23.2	18.0	18.2	7.7	11.7	8.2
Cycle Q Clear(g_c), s	7.2	0.0	0.0	5.0	34.0	0.0	23.2	18.0	18.2	7.7	11.7	8.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.44	1.00		1.00
Lane Grp Cap(c), veh/h	867	1852	829	123	969	593	295	611	597	308	941	869
V/C Ratio(X)	0.38	0.60	0.33	2.13	1.31	0.26	1.42	0.53	0.53	0.64	0.43	0.40
Avail Cap(c_a), veh/h	867	1852	829	123	969	593	295	611	597	328	941	869
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.72	0.72	0.72	0.35	0.35	0.35	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.0	0.0	0.0	57.5	43.0	25.0	48.4	30.6	30.6	51.6	35.8	12.5
Incr Delay (d2), s/veh	0.1	1.1	0.8	516.6	141.5	0.4	208.7	3.3	3.4	2.8	1.4	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.3	0.2	10.9	35.1	3.5	26.8	9.0	9.0	3.3	5.7	5.2
LnGrp Delay(d),s/veh	19.1	1.1	0.8	574.1	184.5	25.4	257.1	33.8	34.0	54.4	37.2	13.9
LnGrp LOS	B	A	A	F	F	C	F	C	C	D	D	B
Approach Vol, veh/h		1723			1682			1062			951	
Approach Delay, s/veh		4.5			230.8			122.0			32.3	
Approach LOS		A			F			F			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.6	70.7	27.8	38.4	40.9	39.4	17.9	48.3				
Change Period (Y+Rc), s	4.6	5.4	4.6	5.4	5.4	* 5.4	5.4	* 5.4				
Max Green Setting (Gmax), s	5.0	38.8	23.2	33.0	9.8	* 34	13.3	* 43				
Max Q Clear Time (g_c+I1), s	7.0	2.0	25.2	13.7	9.2	36.0	9.7	20.2				
Green Ext Time (p_c), s	0.0	17.0	0.0	3.9	0.1	0.0	1.5	3.8				
Intersection Summary												
HCM 2010 Ctrl Delay			102.7									
HCM 2010 LOS			F									
Notes												

Timings
4: Arrowhead Av. & Orange Show Rd.

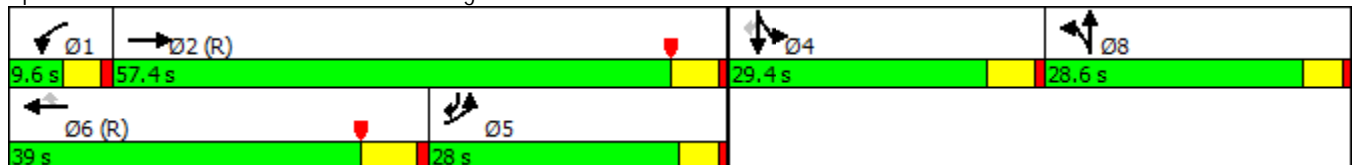


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖	↗	↖	↗	↗
Traffic Volume (vph)	316	1059	13	948	183	26	19	277	15	535
Future Volume (vph)	316	1059	13	948	183	26	19	277	15	535
Turn Type	Prot	NA	Prot	NA	Perm	Split	NA	Split	NA	pm+ov
Protected Phases	5	2	1	6		8	8	4	4	5
Permitted Phases					6					4
Detector Phase	5	2	1	6	6	8	8	4	4	5
Switch Phase										
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	5.0
Minimum Split (s)	9.6	28.4	9.6	29.2	29.2	28.6	28.6	29.4	29.4	9.6
Total Split (s)	28.0	57.4	9.6	39.0	39.0	28.6	28.6	29.4	29.4	28.0
Total Split (%)	22.4%	45.9%	7.7%	31.2%	31.2%	22.9%	22.9%	23.5%	23.5%	22.4%
Yellow Time (s)	3.6	4.4	3.6	5.2	5.2	3.6	3.6	4.4	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	6.2	6.2	4.6	4.6	5.4	5.4	4.6
Lead/Lag	Lag	Lag	Lead	Lead	Lead					Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	C-Max	None	C-Max	C-Max	Max	Max	Max	Max	None
Act Effect Green (s)	23.4	57.8	5.0	32.8	32.8	24.0	24.0	24.0	24.0	52.8
Actuated g/C Ratio	0.19	0.46	0.04	0.26	0.26	0.19	0.19	0.19	0.19	0.42
v/c Ratio	1.07	0.69	0.21	1.08	0.34	0.09	0.12	0.48	0.45	0.57
Control Delay	118.2	30.1	65.3	96.8	10.9	42.5	25.3	50.8	49.5	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	118.2	30.1	65.3	96.8	10.9	42.5	25.3	50.8	49.5	9.3
LOS	F	C	E	F	B	D	C	D	D	A
Approach Delay		50.2		82.7			32.1		23.7	
Approach LOS		D		F			C		C	

Intersection Summary

Cycle Length: 125
 Actuated Cycle Length: 125
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.08
 Intersection Signal Delay: 54.3
 Intersection LOS: D
 Intersection Capacity Utilization 97.6%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 4: Arrowhead Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis

4: Arrowhead Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗	↖	↗		↖	↗	↗
Traffic Volume (vph)	316	1059	12	13	948	183	26	19	20	277	15	535
Future Volume (vph)	316	1059	12	13	948	183	26	19	20	277	15	535
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	6.2	6.2	4.6	4.6		5.4	5.4	4.6
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		0.95	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	0.98		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00
Satd. Flow (prot)	1700	3600		1700	3600	1800	1700	1800		1700	1800	1800
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00
Satd. Flow (perm)	1700	3600		1700	3600	1800	1700	1800		1700	1800	1800
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	340	1139	13	14	1019	197	28	20	22	298	16	575
RTOR Reduction (vph)	0	1	0	0	0	120	0	18	0	0	0	251
Lane Group Flow (vph)	340	1151	0	14	1019	77	28	24	0	158	156	324
Confl. Peds. (#/hr)									15			23
Confl. Bikes (#/hr)												1
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		8	8		4	4	5
Permitted Phases						6						4
Actuated Green, G (s)	26.2	55.0		2.0	30.0	30.0	24.0	24.0		24.0	24.0	50.2
Effective Green, g (s)	26.2	55.0		2.0	30.0	30.0	24.0	24.0		24.0	24.0	50.2
Actuated g/C Ratio	0.21	0.44		0.02	0.24	0.24	0.19	0.19		0.19	0.19	0.40
Clearance Time (s)	4.6	5.4		4.6	6.2	6.2	4.6	4.6		5.4	5.4	4.6
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	3.0	3.0		3.0	3.0	2.0
Lane Grp Cap (vph)	356	1584		27	864	432	326	345		326	345	789
v/s Ratio Prot	c0.20	0.32		0.01	c0.28		c0.02	0.01		c0.09	0.09	0.09
v/s Ratio Perm						0.04						0.09
v/c Ratio	0.96	0.73		0.52	1.18	0.18	0.09	0.07		0.48	0.45	0.41
Uniform Delay, d1	48.8	28.8		61.0	47.5	37.7	41.5	41.4		45.0	44.7	26.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	35.5	3.0		6.8	92.7	0.9	0.5	0.4		5.1	4.2	0.1
Delay (s)	84.3	31.8		67.8	140.2	38.6	42.0	41.8		50.1	48.9	26.9
Level of Service	F	C		E	F	D	D	D		D	D	C
Approach Delay (s)		43.7			123.1			41.9			34.9	
Approach LOS		D			F			D			C	

Intersection Summary

HCM 2000 Control Delay	68.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	20.8
Intersection Capacity Utilization	97.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	316	1059	12	13	948	183	26	19	20	277	15	535
Future Volume (veh/h)	316	1059	12	13	948	183	26	19	20	277	15	535
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	340	1139	13	14	1019	145	28	20	7	309	0	506
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	2	0	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	614	2214	25	25	897	401	311	243	85	622	0	860
Arrive On Green	0.38	0.64	0.64	0.02	0.26	0.26	0.19	0.19	0.19	0.19	0.00	0.19
Sat Flow, veh/h	1619	3463	40	1619	3420	1530	1619	1266	443	3238	0	1456
Grp Volume(v), veh/h	340	562	590	14	1019	145	28	0	27	309	0	506
Grp Sat Flow(s),veh/h/ln	1619	1710	1793	1619	1710	1530	1619	0	1709	1619	0	1456
Q Serve(g_s), s	20.6	22.1	22.1	1.1	32.8	9.7	1.8	0.0	1.6	10.7	0.0	0.0
Cycle Q Clear(g_c), s	20.6	22.1	22.1	1.1	32.8	9.7	1.8	0.0	1.6	10.7	0.0	0.0
Prop In Lane	1.00		0.02	1.00		1.00	1.00		0.26	1.00		1.00
Lane Grp Cap(c), veh/h	614	1093	1146	25	897	401	311	0	328	622	0	860
V/C Ratio(X)	0.55	0.51	0.51	0.56	1.14	0.36	0.09	0.00	0.08	0.50	0.00	0.59
Avail Cap(c_a), veh/h	614	1093	1146	65	897	401	311	0	328	622	0	860
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.32	0.32	0.32	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.5	12.1	12.1	61.1	46.1	37.6	41.5	0.0	41.5	45.1	0.0	17.1
Incr Delay (d2), s/veh	0.2	0.6	0.5	7.2	74.7	2.5	0.6	0.0	0.5	2.8	0.0	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.2	10.5	11.0	0.5	24.8	4.3	0.8	0.0	0.8	5.0	0.0	11.8
LnGrp Delay(d),s/veh	30.7	12.7	12.6	68.3	120.8	40.1	42.1	0.0	42.0	47.9	0.0	20.1
LnGrp LOS	C	B	B	E	F	D	D		D	D		C
Approach Vol, veh/h		1492			1178			55			815	
Approach Delay, s/veh		16.8			110.2			42.0			30.6	
Approach LOS		B			F			D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.5	85.5		29.4	53.0	39.0		28.6				
Change Period (Y+Rc), s	4.6	5.4		5.4	5.4	* 6.2		4.6				
Max Green Setting (Gmax), s	5.0	52.0		24.0	23.4	* 33		24.0				
Max Q Clear Time (g_c+I1), s	3.1	24.1		12.7	22.6	34.8		3.8				
Green Ext Time (p_c), s	0.0	12.2		2.5	0.1	0.0		0.1				
Intersection Summary												
HCM 2010 Ctrl Delay	51.5											
HCM 2010 LOS	D											
Notes												

Timings

5: Washington Av./Washington Av. & Orange Show Rd.

3/27/2017

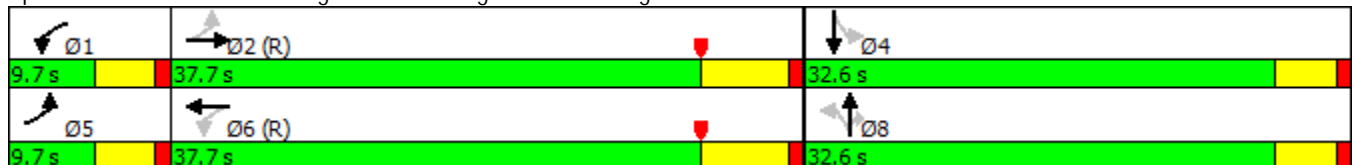


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↗	↖	↗		↖	↗		↕
Traffic Volume (vph)	39	1546	5	1106	62	5	9	11	2
Future Volume (vph)	39	1546	5	1106	62	5	9	11	2
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	Perm	NA
Protected Phases	5	2	1	6		8			4
Permitted Phases	2		6		8		8	4	
Detector Phase	5	2	1	6	8	8	8	4	4
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	23.2	9.6	23.2	32.6	32.6	32.6	32.6	32.6
Total Split (s)	9.7	37.7	9.7	37.7	32.6	32.6	32.6	32.6	32.6
Total Split (%)	12.1%	47.1%	12.1%	47.1%	40.8%	40.8%	40.8%	40.8%	40.8%
Yellow Time (s)	3.6	5.2	3.6	5.2	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	4.6	6.2	4.6	6.2		4.6	4.6		4.6
Lead/Lag	Lead	Lag	Lead	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None
Act Effect Green (s)	60.1	57.8	59.1	53.9		13.6	13.6		13.6
Actuated g/C Ratio	0.75	0.72	0.74	0.67		0.17	0.17		0.17
v/c Ratio	0.03	0.67	0.00	0.51		0.24	0.03		0.09
Control Delay	5.4	13.1	6.2	12.0		28.4	0.1		16.1
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Delay	5.4	13.1	6.2	12.0		28.4	0.1		16.1
LOS	A	B	A	B		C	A		B
Approach Delay		12.9		12.0		25.0			16.1
Approach LOS		B		B		C			B

Intersection Summary

Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.67
 Intersection Signal Delay: 12.9
 Intersection LOS: B
 Intersection Capacity Utilization 75.7%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 5: Washington Av./Washington Av. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 5: Washington Av./Washington Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↖	↗		↕	
Traffic Volume (vph)	39	1546	33	5	1106	17	62	5	9	11	2	14
Future Volume (vph)	39	1546	33	5	1106	17	62	5	9	11	2	14
Ideal Flow (vphp)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2		4.6	6.2			4.6	4.6		4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85		0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.98	
Satd. Flow (prot)	1700	3600		1700	3600			1800	1800		1800	
Flt Permitted	0.17	1.00		0.08	1.00			0.72	1.00		0.88	
Satd. Flow (perm)	1700	3600		1700	3600			1800	1800		1800	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	43	1699	36	5	1215	19	68	5	10	12	2	15
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	9	0	13	0
Lane Group Flow (vph)	43	1734	0	5	1233	0	0	73	1	0	16	0
Confl. Bikes (#/hr)			1									1
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)	55.1	52.0		50.9	49.9			11.6	11.6		11.6	
Effective Green, g (s)	55.1	52.0		50.9	49.9			11.6	11.6		11.6	
Actuated g/C Ratio	0.69	0.65		0.64	0.62			0.14	0.14		0.14	
Clearance Time (s)	4.6	6.2		4.6	6.2			4.6	4.6		4.6	
Vehicle Extension (s)	2.0	4.0		2.0	4.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	1170	2340		1081	2245			261	261		261	
v/s Ratio Prot	c0.00	c0.48		0.00	0.34							
v/s Ratio Perm	0.02			0.00				0.04	0.00		0.01	
v/c Ratio	0.04	0.74		0.00	0.55			0.28	0.01		0.06	
Uniform Delay, d1	5.0	9.5		7.9	8.6			30.5	29.3		29.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.0	2.2		0.0	1.0			0.6	0.0		0.1	
Delay (s)	5.0	11.6		7.9	9.6			31.1	29.3		29.6	
Level of Service	A	B		A	A			C	C		C	
Approach Delay (s)		11.5			9.6			30.8			29.6	
Approach LOS		B			A			C			C	





















Intersection Summary

HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.4
Intersection Capacity Utilization	75.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary
 5: Washington Av./Washington Av. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/27/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	1546	33	5	1106	17	62	5	9	11	2	14
Future Volume (veh/h)	39	1546	33	5	1106	17	62	5	9	11	2	14
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	43	1699	36	5	1215	19	68	5	9	12	2	5
Adj No. of Lanes	1	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	356	2359	50	203	2265	35	245	15	171	141	29	35
Arrive On Green	0.04	0.69	0.69	0.01	0.66	0.66	0.11	0.11	0.11	0.11	0.11	0.11
Sat Flow, veh/h	1619	3423	72	1619	3447	54	1414	134	1530	605	264	310
Grp Volume(v), veh/h	43	847	888	5	603	631	73	0	9	19	0	0
Grp Sat Flow(s),veh/h/ln	1619	1710	1785	1619	1710	1790	1548	0	1530	1179	0	0
Q Serve(g_s), s	0.7	24.4	24.6	0.1	14.9	14.9	0.0	0.0	0.4	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.7	24.4	24.6	0.1	14.9	14.9	3.1	0.0	0.4	3.2	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.03	0.93		1.00	0.63		0.26
Lane Grp Cap(c), veh/h	356	1178	1230	203	1124	1177	260	0	171	205	0	0
V/C Ratio(X)	0.12	0.72	0.72	0.02	0.54	0.54	0.28	0.00	0.05	0.09	0.00	0.00
Avail Cap(c_a), veh/h	397	1178	1230	295	1124	1177	606	0	535	557	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.09	0.09	0.09	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	5.4	7.7	7.7	7.6	7.3	7.3	33.0	0.0	31.7	31.9	0.0	0.0
Incr Delay (d2), s/veh	0.1	3.8	3.7	0.0	0.2	0.2	0.6	0.0	0.1	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	12.5	13.1	0.0	6.9	7.2	1.5	0.0	0.2	0.4	0.0	0.0
LnGrp Delay(d),s/veh	5.4	11.4	11.4	7.6	7.4	7.4	33.5	0.0	31.9	32.1	0.0	0.0
LnGrp LOS	A	B	B	A	A	A	C		C	C		
Approach Vol, veh/h		1778			1239			82			19	
Approach Delay, s/veh		11.3			7.4			33.4			32.1	
Approach LOS		B			A			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.1	61.3		13.5	7.7	58.8		13.5				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.1	31.5		28.0	5.1	31.5		28.0				
Max Q Clear Time (g_c+I1), s	2.1	26.6		5.2	2.7	16.9		5.1				
Green Ext Time (p_c), s	0.0	4.8		0.5	0.0	13.9		0.5				
Intersection Summary												
HCM 2010 Ctrl Delay				10.4								
HCM 2010 LOS				B								

Intersection

Int Delay, s/veh 2.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	32	0	0	44	26	14
Future Vol, veh/h	32	0	0	44	26	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	35	0	0	48	28	15

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	84	36	43	0	-	0
Stage 1	36	-	-	-	-	-
Stage 2	48	-	-	-	-	-
Critical Hdwy	7.1	6.2	4.1	-	-	-
Critical Hdwy Stg 1	6.1	-	-	-	-	-
Critical Hdwy Stg 2	6.1	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	920	1054	1583	-	-	-
Stage 1	994	-	-	-	-	-
Stage 2	971	-	-	-	-	-
Platoon blocked, %	1	1	1	-	-	-
Mov Cap-1 Maneuver	920	1054	1583	-	-	-
Mov Cap-2 Maneuver	920	-	-	-	-	-
Stage 1	994	-	-	-	-	-
Stage 2	971	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1583	-	920	-	-
HCM Lane V/C Ratio	-	-	0.038	-	-
HCM Control Delay (s)	0	-	9.1	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔						↔	
Traffic Vol, veh/h	0	0	0	0	0	33	0	0	0	23	0	0
Future Vol, veh/h	0	0	0	0	0	33	0	0	0	23	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	54	54	54	54	54	54	54	54	54	54	54	54
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	61	0	0	0	43	0	0

Major/Minor	Major1			Major2			Minor2				
Conflicting Flow All	61	0	-	-	-	0	-	-	31	31	31
Stage 1	-	-	-	-	-	-	-	-	31	31	-
Stage 2	-	-	-	-	-	-	-	-	0	0	-
Critical Hdwy	4.1	-	-	-	-	-	-	-	6.4	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	5.4	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	5.4	5.5	-
Follow-up Hdwy	2.2	-	-	-	-	-	-	-	3.5	4	3.3
Pot Cap-1 Maneuver	1555	-	0	0	-	-	-	-	988	866	1049
Stage 1	-	-	0	0	-	-	-	-	997	873	-
Stage 2	-	-	0	0	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1555	-	-	-	-	-	-	-	988	0	1049
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	988	0	-
Stage 1	-	-	-	-	-	-	-	-	997	0	-
Stage 2	-	-	-	-	-	-	-	-	-	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1555	-	-	-	988
HCM Lane V/C Ratio	-	-	-	-	0.043
HCM Control Delay (s)	0	-	-	-	8.8
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection

Int Delay, s/veh 6.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	0	1	32	0	32	0	20	14	0
Future Vol, veh/h	0	0	0	0	1	32	0	32	0	20	14	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	69	69	69	69	69	69	69	69	69	69	69	69
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	1	46	0	46	0	29	20	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	48	0	0	1	0	0	36	49	1	50	26	25
Stage 1	-	-	-	-	-	-	1	1	-	25	25	-
Stage 2	-	-	-	-	-	-	35	48	-	25	1	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1572	-	-	1635	-	-	975	846	1090	955	871	1057
Stage 1	-	-	-	-	-	-	1027	899	-	998	878	-
Stage 2	-	-	-	-	-	-	986	859	-	998	899	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1572	-	-	1635	-	-	958	846	1090	915	871	1057
Mov Cap-2 Maneuver	-	-	-	-	-	-	958	846	-	915	871	-
Stage 1	-	-	-	-	-	-	1027	899	-	998	878	-
Stage 2	-	-	-	-	-	-	963	859	-	947	899	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	9.5	9.3
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	846	1572	-	-	1635	-	-	896
HCM Lane V/C Ratio	0.055	-	-	-	-	-	-	0.055
HCM Control Delay (s)	9.5	0	-	-	0	-	-	9.3
HCM Lane LOS	A	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.2

Timings

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.

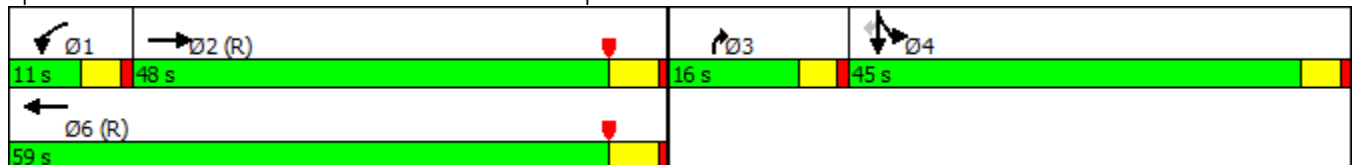


Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↖	↑↑	↗	↖	↗	↗
Traffic Volume (vph)	905	27	791	78	640	142	421
Future Volume (vph)	905	27	791	78	640	142	421
Turn Type	NA	Prot	NA	Prot	Split	NA	Perm
Protected Phases	2	1	6	3	4	4	
Permitted Phases							4
Detector Phase	2	1	6	3	4	4	4
Switch Phase							
Minimum Initial (s)	10.0	5.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	22.4	9.6	15.4	9.5	14.6	14.6	14.6
Total Split (s)	48.0	11.0	59.0	16.0	45.0	45.0	45.0
Total Split (%)	40.0%	9.2%	49.2%	13.3%	37.5%	37.5%	37.5%
Yellow Time (s)	4.4	3.6	4.4	3.5	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	4.6	5.4	4.5	4.6	4.6	4.6
Lead/Lag	Lag	Lead		Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes
Recall Mode	C-Max	None	C-Max	None	Max	Max	Max
Act Effect Green (s)	47.0	5.9	53.6	5.8	48.1	48.1	48.1
Actuated g/C Ratio	0.39	0.05	0.45	0.05	0.40	0.40	0.40
v/c Ratio	0.71	0.35	0.53	0.41	0.62	0.58	0.51
Control Delay	34.9	66.6	25.6	9.3	34.4	33.1	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	66.6	25.6	9.3	34.4	33.1	12.6
LOS	C	E	C	A	C	C	B
Approach Delay	34.9		26.9			26.3	
Approach LOS	C		C			C	

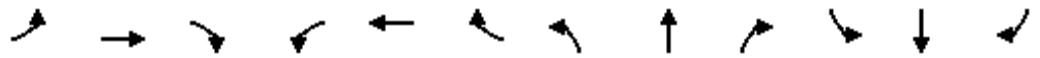
Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 11 (9%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 28.7
 Intersection LOS: C
 Intersection Capacity Utilization 66.9%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.






















HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑				↗	↖	↑↑	↗
Traffic Volume (vph)	0	905	20	27	791	0	0	0	78	640	142	421
Future Volume (vph)	0	905	20	27	791	0	0	0	78	640	142	421
Ideal Flow (vphp)	1800	1800	1800	1700	1800	1800	1800	1800	1800	1700	1800	1800
Total Lost time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Lane Util. Factor		0.95		1.00	0.95				1.00	0.95	0.95	1.00
Frbp, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Frt		1.00		1.00	1.00				0.86	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00				1.00	0.95	0.97	1.00
Satd. Flow (prot)		3600		1700	3600				1800	1700	1800	1800
Flt Permitted		1.00		0.95	1.00				1.00	0.95	0.97	1.00
Satd. Flow (perm)		3600		1700	3600				1800	1700	1800	1800
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	973	22	29	851	0	0	0	84	688	153	453
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	81	0	0	166
Lane Group Flow (vph)	0	994	0	29	851	0	0	0	3	420	421	287
Confl. Peds. (#/hr)			3			1						
Turn Type		NA		Prot	NA				Prot	Split	NA	Perm
Protected Phases		2		1	6				3	4	4	
Permitted Phases												4
Actuated Green, G (s)		44.3		3.8	52.7				4.7	48.1	48.1	48.1
Effective Green, g (s)		44.3		3.8	52.7				4.7	48.1	48.1	48.1
Actuated g/C Ratio		0.37		0.03	0.44				0.04	0.40	0.40	0.40
Clearance Time (s)		5.4		4.6	5.4				4.5	4.6	4.6	4.6
Vehicle Extension (s)		3.0		2.0	3.0				3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1329		53	1581				70	681	721	721
v/s Ratio Prot		c0.28		0.02	c0.24				c0.00	c0.25	0.23	
v/s Ratio Perm												0.16
v/c Ratio		0.75		0.55	0.54				0.05	0.62	0.58	0.40
Uniform Delay, d1		33.0		57.3	24.7				55.5	28.6	28.1	25.6
Progression Factor		1.00		1.00	1.00				1.00	1.00	1.00	1.00
Incremental Delay, d2		3.9		6.1	1.3				0.3	4.2	3.4	1.6
Delay (s)		36.9		63.3	26.0				55.8	32.8	31.6	27.3
Level of Service		D		E	C				E	C	C	C
Approach Delay (s)		36.9			27.3			55.8			30.5	
Approach LOS		D			C			E			C	

Intersection Summary			
HCM 2000 Control Delay	32.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.1
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	905	20	27	791	0	0	0	78	640	142	421
Future Volume (veh/h)	0	905	20	27	791	0	0	0	78	640	142	421
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1800	1800	1700	1800	0	0	0	1800	1700	1800	1800
Adj Flow Rate, veh/h	0	973	16	29	851	0	0	0	56	797	0	451
Adj No. of Lanes	0	2	0	1	2	0	0	0	1	2	0	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	0	1776	29	42	1984	0	0	0	0	1090	0	515
Arrive On Green	0.00	0.52	0.52	0.03	0.58	0.00	0.00	0.00	0.00	0.34	0.00	0.34
Sat Flow, veh/h	0	3533	57	1619	3510	0		0		3238	0	1530
Grp Volume(v), veh/h	0	483	506	29	851	0		0.0		797	0	451
Grp Sat Flow(s),veh/h/ln	0	1710	1790	1619	1710	0				1619	0	1530
Q Serve(g_s), s	0.0	22.9	22.9	2.1	16.7	0.0				26.0	0.0	33.3
Cycle Q Clear(g_c), s	0.0	22.9	22.9	2.1	16.7	0.0				26.0	0.0	33.3
Prop In Lane	0.00		0.03	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	882	923	42	1984	0				1090	0	515
V/C Ratio(X)	0.00	0.55	0.55	0.69	0.43	0.00				0.73	0.00	0.88
Avail Cap(c_a), veh/h	0	882	923	86	1984	0				1090	0	515
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.09	0.09	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	19.6	19.6	58.0	14.1	0.0				35.0	0.0	37.4
Incr Delay (d2), s/veh	0.0	2.4	2.3	0.7	0.1	0.0				4.3	0.0	18.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	11.3	11.8	1.0	7.8	0.0				12.3	0.0	16.7
LnGrp Delay(d),s/veh	0.0	22.0	21.9	58.7	14.2	0.0				39.4	0.0	55.9
LnGrp LOS		C	C	E	B					D		E
Approach Vol, veh/h		989			880						1248	
Approach Delay, s/veh		22.0			15.6						45.3	
Approach LOS		C			B						D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	7.7	67.3		45.0		75.0						
Change Period (Y+Rc), s	4.6	5.4		4.6		5.4						
Max Green Setting (Gmax), s	6.4	42.6		40.4		53.6						
Max Q Clear Time (g_c+I1), s	4.1	24.9		35.3		18.7						
Green Ext Time (p_c), s	0.0	10.9		2.3		15.9						
Intersection Summary												
HCM 2010 Ctrl Delay			29.5									
HCM 2010 LOS			C									
Notes												

Timings

9: Waterman Av. & Orange Show Rd./Orange Show Rd.

3/28/2017

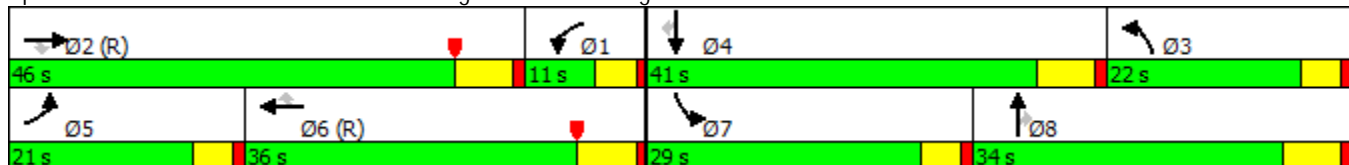


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗	↘	↘	↗	↘	↘	↗	↘	↘	↗	↘
Traffic Volume (vph)	242	849	187	206	611	119	307	1018	196	143	958	155
Future Volume (vph)	242	849	187	206	611	119	307	1018	196	143	958	155
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.2	35.2	9.6	35.2	35.2	9.6	33.2	33.2	9.6	33.2	33.2
Total Split (s)	21.0	46.0	46.0	11.0	36.0	36.0	22.0	34.0	34.0	29.0	41.0	41.0
Total Split (%)	17.5%	38.3%	38.3%	9.2%	30.0%	30.0%	18.3%	28.3%	28.3%	24.2%	34.2%	34.2%
Yellow Time (s)	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Act Effect Green (s)	16.4	39.8	39.8	6.4	29.8	29.8	17.4	37.2	37.2	15.0	34.8	34.8
Actuated g/C Ratio	0.14	0.33	0.33	0.05	0.25	0.25	0.14	0.31	0.31	0.12	0.29	0.29
v/c Ratio	1.10	0.75	0.27	2.41	1.44	0.22	1.31	0.96	0.31	0.71	0.97	0.25
Control Delay	136.2	40.4	4.9	691.8	244.3	2.8	207.4	60.5	9.4	67.9	63.0	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	136.2	40.4	4.9	691.8	244.3	2.8	207.4	60.5	9.4	67.9	63.0	4.2
LOS	F	D	A	F	F	A	F	E	A	E	E	A
Approach Delay		53.3			312.2			83.6			56.3	
Approach LOS		D			F			F			E	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 2.41
 Intersection Signal Delay: 111.8
 Intersection LOS: F
 Intersection Capacity Utilization 113.9%
 ICU Level of Service H
 Analysis Period (min) 15

Splits and Phases: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

























3/28/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	242	849	187	206	611	119	307	1018	196	143	958	155
Future Volume (vph)	242	849	187	206	611	119	307	1018	196	143	958	155
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	255	894	197	217	643	125	323	1072	206	151	1008	163
RTOR Reduction (vph)	0	0	132	0	0	94	0	0	117	0	0	116
Lane Group Flow (vph)	255	894	65	217	643	31	323	1072	89	151	1008	47
Confl. Peds. (#/hr)			1						1			
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	16.4	39.8	39.8	6.4	29.8	29.8	17.4	37.2	37.2	15.0	34.8	34.8
Effective Green, g (s)	16.4	39.8	39.8	6.4	29.8	29.8	17.4	37.2	37.2	15.0	34.8	34.8
Actuated g/C Ratio	0.14	0.33	0.33	0.05	0.25	0.25	0.14	0.31	0.31	0.12	0.29	0.29
Clearance Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	232	1194	597	90	447	447	246	1116	558	212	1044	522
v/s Ratio Prot	c0.15	0.25		c0.13	c0.36		c0.19	c0.30		0.09	c0.28	
v/s Ratio Perm			0.04			0.02			0.05			0.03
v/c Ratio	1.10	0.75	0.11	2.41	1.44	0.07	1.31	0.96	0.16	0.71	0.97	0.09
Uniform Delay, d1	51.8	35.7	27.8	56.8	45.1	34.5	51.3	40.7	30.1	50.4	42.0	31.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	88.1	4.3	0.4	667.5	209.7	0.3	166.8	19.0	0.6	9.0	20.7	0.3
Delay (s)	139.9	40.0	28.2	724.3	254.8	34.8	218.1	59.7	30.7	59.5	62.7	31.4
Level of Service	F	D	C	F	F	C	F	E	C	E	E	C
Approach Delay (s)		57.2			330.3			87.9			58.5	
Approach LOS		E			F			F			E	

Intersection Summary		
HCM 2000 Control Delay	118.1	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.25	F
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	113.9%	21.6
Analysis Period (min)	15	ICU Level of Service
		H

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	242	849	187	206	611	119	307	1018	196	143	958	155
Future Volume (veh/h)	242	849	187	206	611	119	307	1018	196	143	958	155
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	255	894	144	217	643	90	323	1072	155	151	1008	125
Adj No. of Lanes	1	2	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	221	1134	501	1433	1968	1673	235	1162	519	176	992	444
Arrive On Green	0.14	0.33	0.33	0.89	1.00	1.00	0.14	0.34	0.34	0.11	0.29	0.29
Sat Flow, veh/h	1619	3420	1509	1619	1800	1530	1619	3420	1529	1619	3420	1530
Grp Volume(v), veh/h	255	894	144	217	643	90	323	1072	155	151	1008	125
Grp Sat Flow(s),veh/h/ln	1619	1710	1509	1619	1800	1530	1619	1710	1529	1619	1710	1530
Q Serve(g_s), s	16.4	28.4	8.5	2.1	0.0	0.0	17.4	36.2	7.2	11.0	34.8	14.3
Cycle Q Clear(g_c), s	16.4	28.4	8.5	2.1	0.0	0.0	17.4	36.2	7.2	11.0	34.8	14.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	221	1134	501	1433	1968	1673	235	1162	519	176	992	444
V/C Ratio(X)	1.15	0.79	0.29	0.15	0.33	0.05	1.38	0.92	0.30	0.86	1.02	0.28
Avail Cap(c_a), veh/h	221	1134	501	1433	1968	1673	235	1162	519	329	992	444
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.70	0.70	0.70	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.8	36.3	29.6	0.9	0.0	0.0	51.3	38.1	18.8	52.6	42.6	117.6
Incr Delay (d2), s/veh	98.5	4.0	1.0	0.0	0.4	0.1	193.7	13.4	1.5	4.6	32.7	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.4	14.0	3.7	0.9	0.2	0.0	20.4	19.3	3.3	5.1	20.9	6.3
LnGrp Delay(d),s/veh	150.3	40.2	30.6	0.9	0.4	0.1	245.0	51.5	20.3	57.2	75.3	119.2
LnGrp LOS	F	D	C	A	A	A	F	D	C	E	F	F
Approach Vol, veh/h		1293			950			1550			1284	
Approach Delay, s/veh		60.9			0.5			88.7			77.5	
Approach LOS		E			A			F			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	114.1	46.0	23.6	41.0	21.0	139.1	17.6	47.0				
Change Period (Y+Rc), s	6.2	* 6.2	6.2	* 6.2	4.6	6.2	4.6	6.2				
Max Green Setting (Gmax), s	6.4	* 40	17.4	* 35	16.4	29.8	24.4	27.8				
Max Q Clear Time (g_c+I1), s	4.1	30.4	19.4	36.8	18.4	2.0	13.0	38.2				
Green Ext Time (p_c), s	0.8	5.2	0.0	0.0	0.0	6.6	0.1	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			62.3									
HCM 2010 LOS			E									
Notes												

Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↕	
Traffic Vol, veh/h	3	21	16	1517	1438	9
Future Vol, veh/h	3	21	16	1517	1438	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	75	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	3	23	17	1649	1563	10

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	2427	786	1573 0
Stage 1	1568	-	- -
Stage 2	859	-	- -
Critical Hdwy	6.8	6.9	4.1 -
Critical Hdwy Stg 1	5.8	-	- -
Critical Hdwy Stg 2	5.8	-	- -
Follow-up Hdwy	3.5	3.3	2.2 -
Pot Cap-1 Maneuver	*27	*490	*736 -
Stage 1	*462	-	- -
Stage 2	*434	-	- -
Platoon blocked, %		1	1 -
Mov Cap-1 Maneuver	*26	*490	*736 -
Mov Cap-2 Maneuver	*214	-	- -
Stage 1	*462	-	- -
Stage 2	*424	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	13.9	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	* 736	-	214	490	-	-
HCM Lane V/C Ratio	0.024	-	0.015	0.047	-	-
HCM Control Delay (s)	10	-	22.1	12.7	-	-
HCM Lane LOS	B	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0	0.1	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Timings
11: Waterman Av. & Driveway 2/Park Center Dr.

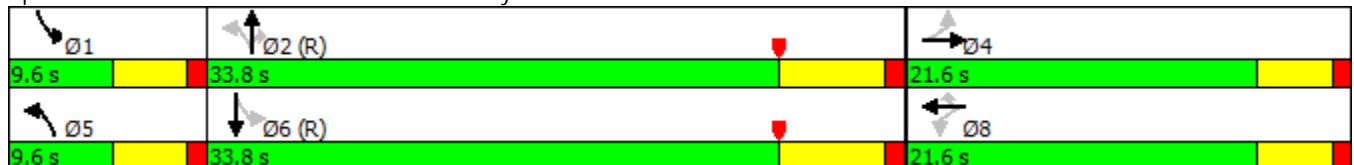


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↕		↕	↗	↖	↑↑	↗	↖	↕
Traffic Volume (vph)	55	0	127	0	43	38	1506	15	10	1655
Future Volume (vph)	55	0	127	0	43	38	1506	15	10	1655
Turn Type	Perm	NA	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4		8		5	2		1	6
Permitted Phases	4		8		8	2		2	6	
Detector Phase	4	4	8	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	21.6	21.6	21.6	9.6	23.2	23.2	9.6	33.2
Total Split (s)	21.6	21.6	21.6	21.6	21.6	9.6	33.8	33.8	9.6	33.8
Total Split (%)	33.2%	33.2%	33.2%	33.2%	33.2%	14.8%	52.0%	52.0%	14.8%	52.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		4.6	4.6	4.6	6.2	6.2	4.6	6.2
Lead/Lag						Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)		11.9		11.9	11.9	45.9	44.6	44.6	46.8	40.7
Actuated g/C Ratio		0.18		0.18	0.18	0.71	0.69	0.69	0.72	0.63
v/c Ratio		0.44		0.43	0.11	0.18	0.68	0.01	0.01	0.83
Control Delay		10.5		27.1	0.5	6.2	12.9	0.0	4.5	20.4
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		10.5		27.1	0.5	6.2	12.9	0.0	4.5	20.4
LOS		B		C	A	A	B	A	A	C
Approach Delay		10.5		20.4			12.6			20.3
Approach LOS		B		C			B			C

Intersection Summary

Cycle Length: 65
 Actuated Cycle Length: 65
 Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 16.5
 Intersection LOS: B
 Intersection Capacity Utilization 74.0%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 11: Waterman Av. & Driveway 2/Park Center Dr.



HCM Signalized Intersection Capacity Analysis
 11: Waterman Av. & Driveway 2/Park Center Dr.

Gateway South Building 4 TIA (JN 10187)






















3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↕	↕	↕	↕↕	
Traffic Volume (vph)	55	0	84	127	0	43	38	1506	15	10	1655	23
Future Volume (vph)	55	0	84	127	0	43	38	1506	15	10	1655	23
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)		4.6			4.6	4.6	4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes		1.00			1.00	0.99	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.92			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1621			1800	1800	1615	3600	1800	1700	3600	
Flt Permitted		0.80			0.63	1.00	0.10	1.00	1.00	0.11	1.00	
Satd. Flow (perm)		1326			1800	1800	176	3600	1800	1700	3600	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	61	0	93	141	0	48	42	1673	17	11	1839	26
RTOR Reduction (vph)	0	111	0	0	0	41	0	0	7	0	1	0
Lane Group Flow (vph)	0	43	0	0	141	7	42	1673	10	11	1864	0
Confl. Peds. (#/hr)						1			1			1
Confl. Bikes (#/hr)									1			1
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		4			8		5	2		1		6
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		9.9			9.9	9.9	41.8	38.7	38.7	37.6		36.6
Effective Green, g (s)		9.9			9.9	9.9	41.8	38.7	38.7	37.6		36.6
Actuated g/C Ratio		0.15			0.15	0.15	0.64	0.60	0.60	0.58		0.56
Clearance Time (s)		4.6			4.6	4.6	4.6	6.2	6.2	4.6		6.2
Vehicle Extension (s)		3.0			3.0	3.0	2.0	4.0	4.0	2.0		4.0
Lane Grp Cap (vph)		201			274	274	181	2143	1071	983		2027
v/s Ratio Prot							c0.01	0.46		0.00		c0.52
v/s Ratio Perm		0.03			0.08	0.00	0.14		0.01	0.01		
v/c Ratio		0.21			0.51	0.03	0.23	0.78	0.01	0.01		0.92
Uniform Delay, d1		24.1			25.3	23.4	11.6	9.9	5.4	8.0		12.9
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2		0.5			1.6	0.0	0.2	2.9	0.0	0.0		8.3
Delay (s)		24.7			27.0	23.5	11.8	12.8	5.4	8.0		21.1
Level of Service		C			C	C	B	B	A	A		C
Approach Delay (s)		24.7			26.1			12.7				21.0
Approach LOS		C			C			B				C

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	15.4
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	0	84	127	0	43	38	1506	15	10	1655	23
Future Volume (veh/h)	55	0	84	127	0	43	38	1506	15	10	1655	23
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	61	0	81	141	0	35	42	1673	17	11	1839	26
Adj No. of Lanes	0	1	0	0	1	1	1	2	1	1	2	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	133	28	109	333	0	349	177	1782	780	151	1705	24
Arrive On Green	0.23	0.00	0.23	0.23	0.00	0.23	0.04	0.52	0.52	0.01	0.49	0.49
Sat Flow, veh/h	236	124	478	974	0	1528	1619	3420	1497	1619	3451	49
Grp Volume(v), veh/h	142	0	0	141	0	35	42	1673	17	11	909	956
Grp Sat Flow(s),veh/h/ln	838	0	0	974	0	1528	1619	1710	1497	1619	1710	1790
Q Serve(g_s), s	3.1	0.0	0.0	0.0	0.0	1.2	0.8	29.8	0.4	0.2	32.1	32.1
Cycle Q Clear(g_c), s	12.4	0.0	0.0	9.3	0.0	1.2	0.8	29.8	0.4	0.2	32.1	32.1
Prop In Lane	0.43		0.57	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	270	0	0	333	0	349	177	1782	780	151	845	884
V/C Ratio(X)	0.53	0.00	0.00	0.42	0.00	0.10	0.24	0.94	0.02	0.07	1.08	1.08
Avail Cap(c_a), veh/h	319	0	0	378	0	400	235	1782	780	253	845	884
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.2	0.0	0.0	22.9	0.0	19.8	15.1	14.6	7.5	14.2	16.4	16.4
Incr Delay (d2), s/veh	1.6	0.0	0.0	0.9	0.0	0.1	0.3	11.1	0.1	0.1	53.5	54.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	0.0	2.4	0.0	0.5	0.4	16.7	0.2	0.1	27.6	29.1
LnGrp Delay(d),s/veh	25.8	0.0	0.0	23.8	0.0	19.9	15.4	25.6	7.6	14.3	69.9	71.0
LnGrp LOS	C			C		B	B	C	A	B	F	F
Approach Vol, veh/h		142			176			1732			1876	
Approach Delay, s/veh		25.8			23.0			25.2			70.2	
Approach LOS		C			C			C			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.5	40.1		19.4	7.3	38.3		19.4				
Change Period (Y+Rc), s	4.6	6.2		4.6	4.6	6.2		4.6				
Max Green Setting (Gmax), s	5.0	27.6		17.0	5.0	27.6		17.0				
Max Q Clear Time (g_c+I1), s	2.2	31.8		14.4	2.8	34.1		11.3				
Green Ext Time (p_c), s	0.0	0.0		0.5	0.0	0.0		0.9				
Intersection Summary												
HCM 2010 Ctrl Delay			46.6									
HCM 2010 LOS			D									

Timings

12: Waterman Av./Waterman Av. & Hospitality Ln.

3/27/2017

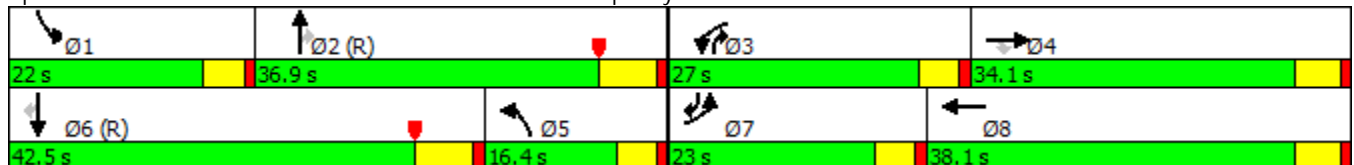


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↕	↗	↘↗	↕	↘↗	↕	↘↗	↘	↕↕↕	↗
Traffic Volume (vph)	211	462	697	522	555	361	712	949	280	1352	202
Future Volume (vph)	211	462	697	522	555	361	712	949	280	1352	202
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8	5	2	3	1	6	7
Permitted Phases			4					2			6
Detector Phase	7	4	4	3	8	5	2	3	1	6	7
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	9.6	15.1	15.1	9.6	38.1	9.6	36.2	9.6	9.6	36.2	9.6
Total Split (s)	23.0	34.1	34.1	27.0	38.1	16.4	36.9	27.0	22.0	42.5	23.0
Total Split (%)	19.2%	28.4%	28.4%	22.5%	31.8%	13.7%	30.8%	22.5%	18.3%	35.4%	19.2%
Yellow Time (s)	3.6	4.1	4.1	3.6	4.1	3.6	5.2	3.6	3.6	5.2	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	5.1	4.6	5.1	4.6	6.2	4.6	4.6	6.2	4.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effect Green (s)	17.6	28.4	28.4	22.3	33.1	11.8	30.7	59.2	18.1	37.0	56.2
Actuated g/C Ratio	0.15	0.24	0.24	0.19	0.28	0.10	0.26	0.49	0.15	0.31	0.47
v/c Ratio	0.90	0.89	0.67	0.94	0.77	1.22	0.82	0.55	1.16	0.86	0.24
Control Delay	86.7	50.0	26.8	70.5	36.7	170.6	50.7	19.5	152.7	45.8	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.7	50.0	26.8	70.5	36.7	170.6	50.7	19.5	152.7	45.8	7.5
LOS	F	D	C	E	D	F	D	B	F	D	A
Approach Delay		49.5			50.7		57.4			57.9	
Approach LOS		D			D		E			E	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 22 (18%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 115
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.22
 Intersection Signal Delay: 54.6
 Intersection LOS: D
 Intersection Capacity Utilization 98.4%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 12: Waterman Av./Waterman Av. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
 12: Waterman Av./Waterman Av. & Hospitality Ln.
























Gateway South Building 4 TIA (JN 10187)

3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	211	462	697	522	555	182	361	712	949	280	1352	202
Future Volume (vph)	211	462	697	522	555	182	361	712	949	280	1352	202
Ideal Flow (vphp)	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Lane Util. Factor	1.00	0.91	0.91	0.97	0.95		0.97	0.95	0.88	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.94	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Flt Permitted	1.00	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600		3200	3600	3600	1700	5400	1800
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	224	491	741	555	590	194	384	757	1010	298	1438	215
RTOR Reduction (vph)	0	98	146	0	27	0	0	0	70	0	0	41
Lane Group Flow (vph)	224	749	239	555	757	0	384	757	940	298	1438	174
Confl. Peds. (#/hr)						7			5			13
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases			4						2			6
Actuated Green, G (s)	17.6	28.4	28.4	22.3	33.1		11.8	30.7	53.0	18.1	37.0	54.6
Effective Green, g (s)	17.6	28.4	28.4	22.3	33.1		11.8	30.7	53.0	18.1	37.0	54.6
Actuated g/C Ratio	0.15	0.24	0.24	0.19	0.28		0.10	0.26	0.44	0.15	0.31	0.46
Clearance Time (s)	4.6	5.1	5.1	4.6	5.1		4.6	6.2	4.6	4.6	6.2	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	4.0	2.0	2.0	4.0	2.0
Lane Grp Cap (vph)	249	852	426	594	993		314	921	1590	256	1665	819
v/s Ratio Prot	0.13	c0.21		c0.17	0.21		c0.12	c0.21	0.11	c0.18	0.27	0.03
v/s Ratio Perm			0.13						0.15			0.07
v/c Ratio	0.90	0.88	0.56	0.93	0.76		1.22	0.82	0.59	1.16	0.86	0.21
Uniform Delay, d1	50.3	44.1	40.3	48.1	39.8		54.1	42.1	25.3	51.0	39.1	19.7
Progression Factor	1.00	1.00	1.00	1.00	0.83		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	30.9	10.2	1.7	19.8	3.1		125.5	8.2	0.4	107.9	6.2	0.0
Delay (s)	81.2	54.3	42.0	67.9	36.0		179.6	50.3	25.7	158.9	45.3	19.8
Level of Service	F	D	D	E	D		F	D	C	F	D	B
Approach Delay (s)		55.2			49.3			61.8			59.9	
Approach LOS		E			D			E			E	

Intersection Summary		
HCM 2000 Control Delay	57.4	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.96	E
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	98.4%	20.5
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		F

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	211	462	697	522	555	182	361	712	949	280	1352	202
Future Volume (veh/h)	211	462	697	522	555	182	361	712	949	280	1352	202
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1600	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	224	489	612	555	590	179	384	757	644	298	1438	145
Adj No. of Lanes	1	1	2	2	2	0	2	2	2	1	3	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	247	435	739	552	712	216	1521	2344	2342	235	1486	690
Arrive On Green	0.15	0.24	0.24	0.19	0.28	0.28	0.51	0.69	0.69	0.14	0.30	0.30
Sat Flow, veh/h	1619	1800	3060	2956	2583	782	2956	3420	2683	1619	4914	1510
Grp Volume(v), veh/h	224	489	612	555	390	379	384	757	644	298	1438	145
Grp Sat Flow(s),veh/h/ln	1619	1800	1530	1478	1710	1655	1478	1710	1341	1619	1638	1510
Q Serve(g_s), s	16.3	29.0	17.4	22.4	25.7	25.8	8.7	10.7	4.8	17.4	34.6	4.1
Cycle Q Clear(g_c), s	16.3	29.0	17.4	22.4	25.7	25.8	8.7	10.7	4.8	17.4	34.6	4.1
Prop In Lane	1.00		1.00	1.00		0.47	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	247	435	739	552	471	456	1521	2344	2342	235	1486	690
V/C Ratio(X)	0.91	1.12	0.83	1.01	0.83	0.83	0.25	0.32	0.28	1.27	0.97	0.21
Avail Cap(c_a), veh/h	248	435	739	552	471	456	1521	2344	2342	235	1486	690
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.71	0.71	0.71	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.0	45.5	25.2	48.8	40.8	40.8	16.3	7.6	1.3	51.3	41.3	28.0
Incr Delay (d2), s/veh	32.6	81.5	7.8	33.8	8.6	9.0	0.0	0.4	0.3	150.3	16.8	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.5	24.2	8.1	11.7	13.3	12.9	3.5	5.2	1.8	17.6	17.9	3.1
LnGrp Delay(d),s/veh	82.6	127.0	32.9	82.6	49.4	49.9	16.3	8.0	1.6	201.6	58.0	28.7
LnGrp LOS	F	F	C	F	D	D	B	A	A	F	E	C
Approach Vol, veh/h		1325			1324			1785			1881	
Approach Delay, s/veh		76.0			63.4			7.5			78.5	
Approach LOS		E			E			A			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	22.0	89.1	27.0	34.1	68.6	42.5	22.9	38.2				
Change Period (Y+Rc), s	4.6	6.2	4.6	5.1	6.2	* 6.2	4.6	5.1				
Max Green Setting (Gmax), s	17.4	30.7	22.4	29.0	11.8	* 36	18.4	33.0				
Max Q Clear Time (g_c+I1), s	19.4	12.7	24.4	31.0	10.7	36.6	18.3	27.8				
Green Ext Time (p_c), s	0.0	10.4	0.0	0.0	0.2	0.0	0.0	3.9				
Intersection Summary												
HCM 2010 Ctrl Delay			54.8									
HCM 2010 LOS			D									
Notes												

Intersection

Int Delay, s/veh 12.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↘ ↗	↗	↗↗↗	
Traffic Vol, veh/h	0	0	622	2021	2023	876
Future Vol, veh/h	0	0	622	2021	2023	876
Conflicting Peds, #/hr	0	0	0	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	0	0	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	676	2197	2199	952

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	1102	2202 0
Stage 1	-	-	- -
Stage 2	-	-	- -
Critical Hdwy	-	7.1	5.3 -
Critical Hdwy Stg 1	-	-	- -
Critical Hdwy Stg 2	-	-	- -
Follow-up Hdwy	-	3.9	3.1 -
Pot Cap-1 Maneuver	0	*464	*~ 584 -
Stage 1	0	-	- -
Stage 2	0	-	- -
Platoon blocked, %	-	1	1 -
Mov Cap-1 Maneuver	-	*463	*~ 584 -
Mov Cap-2 Maneuver	-	-	- -
Stage 1	-	-	- -
Stage 2	-	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	0	26.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	~ * 584	-	-	-	-
HCM Lane V/C Ratio	1.158	-	-	-	-
HCM Control Delay (s)	113.5	-	0	-	-
HCM Lane LOS	F	-	A	-	-
HCM 95th %tile Q(veh)	22.7	-	-	-	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection

Int Delay, s/veh 0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations						↗		↑↑			↑↑	
Traffic Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Future Vol, veh/h	0	0	0	0	0	1149	0	948	0	0	709	162
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	-	-	-	Free	-	-	-	-	-	None
Storage Length	-	-	-	-	-	0	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	0	0	1197	0	988	0	0	739	169

Major/Minor

	Minor1	Major1	Major2
Conflicting Flow All	-	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	0	0	0
Stage 1	0	0	0
Stage 2	0	0	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach

	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt

	NBTWBLn1	SBT	SBR
Capacity (veh/h)	-	-	-
HCM Lane V/C Ratio	-	-	-
HCM Control Delay (s)	-	0	-
HCM Lane LOS	-	A	-
HCM 95th %tile Q(veh)	-	-	-

Intersection

Int Delay, s/veh

Movement	NWL	NWR
Lane Configurations		
Traffic Vol, veh/h	0	0
Future Vol, veh/h	0	0
Conflicting Peds, #/hr	0	0
Sign Control	Stop	Stop
RT Channelized	-	-
Storage Length	-	-
Veh in Median Storage, #	0	-
Grade, %	0	-
Peak Hour Factor	96	96
Heavy Vehicles, %	0	0
Mvmt Flow	0	0

Major/Minor

Conflicting Flow All

Stage 1

Stage 2

Critical Hdwy

Critical Hdwy Stg 1

Critical Hdwy Stg 2

Follow-up Hdwy

Pot Cap-1 Maneuver

Stage 1

Stage 2

Platoon blocked, %

Mov Cap-1 Maneuver

Mov Cap-2 Maneuver

Stage 1

Stage 2

Approach

HCM Control Delay, s

HCM LOS

Minor Lane/Major Mvmt

Timings

15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.

3/27/2017

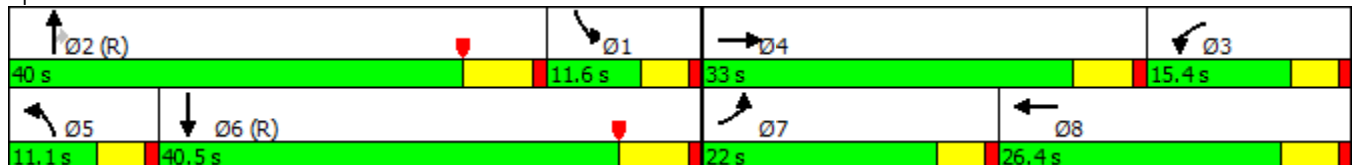


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖↗	↕	↖	↕	↖	↕	↗	↖	↕
Traffic Volume (vph)	682	836	251	529	66	1219	122	420	744
Future Volume (vph)	682	836	251	529	66	1219	122	420	744
Turn Type	Prot	NA	Prot	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phase	7	4	3	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	10.0	5.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	9.6	31.4	9.6	15.4	9.6	36.2	36.2	9.6	36.2
Total Split (s)	22.0	33.0	15.4	26.4	11.1	40.0	40.0	11.6	40.5
Total Split (%)	22.0%	33.0%	15.4%	26.4%	11.1%	40.0%	40.0%	11.6%	40.5%
Yellow Time (s)	3.6	4.4	3.6	4.4	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	5.4	4.6	6.2	6.2	4.6	6.2
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effect Green (s)	17.4	27.6	10.8	21.0	6.2	33.8	33.8	7.0	36.5
Actuated g/C Ratio	0.17	0.28	0.11	0.21	0.06	0.34	0.34	0.07	0.36
v/c Ratio	1.31	1.09	1.46	1.17	0.67	1.07	0.18	3.76	0.78
Control Delay	185.3	89.1	268.3	122.9	75.6	78.6	1.0	1275.6	32.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	185.3	89.1	268.3	122.9	75.6	78.6	1.0	1275.6	32.6
LOS	F	F	F	F	E	E	A	F	C
Approach Delay		127.3		153.6		71.7			403.2
Approach LOS		F		F		E			F

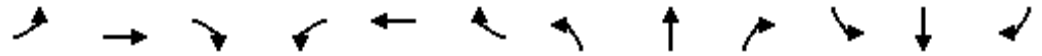
Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 3.76
 Intersection Signal Delay: 187.1
 Intersection LOS: F
 Intersection Capacity Utilization 131.2%
 ICU Level of Service H
 Analysis Period (min) 15

Splits and Phases: 15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl.



HCM Signalized Intersection Capacity Analysis Gateway South Building 4 TIA (JN 10187)
 15: Waterman Av./Waterman Av. & Redlands Bl. /Redlands Bl. 3/27/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↕		↖	↕		↖	↕	↗	↖	↕	↗
Traffic Volume (vph)	682	836	199	251	529	406	66	1219	122	420	744	245
Future Volume (vph)	682	836	199	251	529	406	66	1219	122	420	744	245
Ideal Flow (vphpl)	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.93		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3200	3600		1700	3600		1700	3600	1800	1700	3600	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	726	889	212	267	563	432	70	1297	130	447	791	261
RTOR Reduction (vph)	0	21	0	0	92	0	0	0	87	0	32	0
Lane Group Flow (vph)	726	1080	0	267	903	0	70	1297	43	447	1020	0
Confl. Peds. (#/hr)			3						1			6
Confl. Bikes (#/hr)			1						1			
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	17.4	27.6		10.8	21.0		5.2	32.9	32.9	7.9	35.6	
Effective Green, g (s)	17.4	27.6		10.8	21.0		5.2	32.9	32.9	7.9	35.6	
Actuated g/C Ratio	0.17	0.28		0.11	0.21		0.05	0.33	0.33	0.08	0.36	
Clearance Time (s)	4.6	5.4		4.6	5.4		4.6	6.2	6.2	4.6	6.2	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	556	993		183	756		88	1184	592	134	1281	
v/s Ratio Prot	c0.23	0.30		c0.16	c0.25		0.04	c0.36		c0.26	0.28	
v/s Ratio Perm									0.02			
v/c Ratio	1.31	1.09		1.46	1.19		0.80	1.10	0.07	3.34	0.80	
Uniform Delay, d1	41.3	36.2		44.6	39.5		46.9	33.5	23.1	46.0	28.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	150.3	55.4		234.1	100.0		35.6	56.3	0.2	1070.0	5.2	
Delay (s)	191.6	91.6		278.7	139.5		82.4	89.8	23.3	1116.0	34.2	
Level of Service	F	F		F	F		F	F	C	F	C	
Approach Delay (s)		131.3			169.0			83.7			356.8	
Approach LOS		F			F			F			F	

Intersection Summary		
HCM 2000 Control Delay	183.0	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.40	F
Actuated Cycle Length (s)	100.0	Sum of lost time (s)
Intersection Capacity Utilization	131.2%	20.8
Analysis Period (min)	15	ICU Level of Service
		H

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	682	836	199	251	529	406	66	1219	122	420	744	245
Future Volume (veh/h)	682	836	199	251	529	406	66	1219	122	420	744	245
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1600	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	726	889	205	267	563	391	70	1297	99	447	791	200
Adj No. of Lanes	2	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	514	760	175	175	421	292	87	1156	510	1396	3143	795
Arrive On Green	0.17	0.28	0.28	0.11	0.22	0.22	0.05	0.34	0.34	0.86	1.00	1.00
Sat Flow, veh/h	2956	2752	634	1619	1932	1342	1619	3420	1509	1619	2704	684
Grp Volume(v), veh/h	726	552	542	267	498	456	70	1297	99	447	500	491
Grp Sat Flow(s),veh/h/ln	1478	1710	1676	1619	1710	1563	1619	1710	1509	1619	1710	1678
Q Serve(g_s), s	17.4	27.6	27.6	10.8	21.8	21.8	4.3	33.8	4.6	5.3	0.0	0.0
Cycle Q Clear(g_c), s	17.4	27.6	27.6	10.8	21.8	21.8	4.3	33.8	4.6	5.3	0.0	0.0
Prop In Lane	1.00		0.38	1.00		0.86	1.00		1.00	1.00		0.41
Lane Grp Cap(c), veh/h	514	472	463	175	373	341	87	1156	510	1396	1987	1950
V/C Ratio(X)	1.41	1.17	1.17	1.53	1.34	1.34	0.80	1.12	0.19	0.32	0.25	0.25
Avail Cap(c_a), veh/h	514	472	463	175	373	341	105	1156	510	1396	1987	1950
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.70	0.70	0.70	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.3	36.2	36.2	44.6	39.1	39.1	46.8	33.1	23.5	1.3	0.0	0.0
Incr Delay (d2), s/veh	193.1	91.8	92.5	263.9	168.8	170.3	25.3	66.7	0.8	0.0	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.9	25.0	24.6	17.6	27.7	25.5	2.5	26.6	2.1	2.3	0.2	0.2
LnGrp Delay(d),s/veh	234.4	128.0	128.7	308.5	207.9	209.4	72.1	99.8	24.3	1.4	0.3	0.3
LnGrp LOS	F	F	F	F	F	F	E	F	C	A	A	A
Approach Vol, veh/h		1820			1221			1466			1438	
Approach Delay, s/veh		170.7			230.5			93.4			0.6	
Approach LOS		F			F			F			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	94.8	40.0	16.2	33.0	10.0	124.8	22.0	27.2				
Change Period (Y+Rc), s	6.2	* 6.2	5.4	* 5.4	4.6	6.2	4.6	5.4				
Max Green Setting (Gmax), s	7.0	* 34	10.8	* 28	6.5	34.3	17.4	21.0				
Max Q Clear Time (g_c+I1), s	7.3	35.8	12.8	29.6	6.3	2.0	19.4	23.8				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	10.2	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			122.8									
HCM 2010 LOS			F									
Notes												

Timings
16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

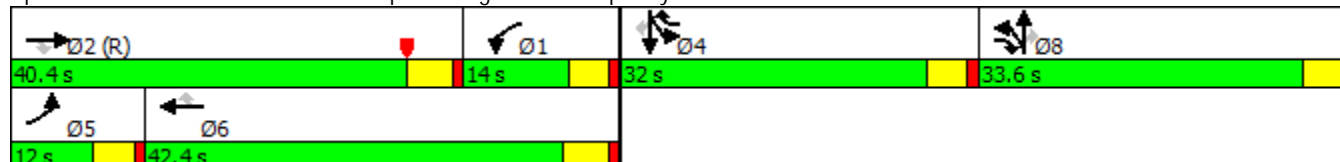


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖↗	↖↗	↖	↖	↗	↗	↖	↗	↖
Traffic Volume (vph)	105	504	158	286	260	517	233	964	319	55	1087	381
Future Volume (vph)	105	504	158	286	260	517	233	964	319	55	1087	381
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	8	1	6	4	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.6	39.1	33.6	9.6	39.1	22.6	33.6	33.6	33.6	22.6	22.6	22.6
Total Split (s)	12.0	40.4	33.6	14.0	42.4	32.0	33.6	33.6	33.6	32.0	32.0	32.0
Total Split (%)	10.0%	33.7%	28.0%	11.7%	35.3%	26.7%	28.0%	28.0%	28.0%	26.7%	26.7%	26.7%
Yellow Time (s)	3.6	4.1	3.6	3.6	4.1	3.6	3.6	3.6	3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lead/Lag	Lead	Lead		Lag	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Recall Mode	None	C-Max	Max	None	None	Max	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	7.4	35.3	69.4	9.4	37.3	65.2	29.0	29.0	29.0	27.4	27.4	27.4
Actuated g/C Ratio	0.06	0.29	0.58	0.08	0.31	0.54	0.24	0.24	0.24	0.23	0.23	0.23
v/c Ratio	1.11	0.52	0.16	1.26	0.45	0.37	0.56	1.25	0.62	0.15	1.45	0.80
Control Delay	157.8	39.8	9.3	188.3	21.1	12.0	46.1	159.6	25.5	38.4	245.8	40.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	157.8	39.8	9.3	188.3	21.1	12.0	46.1	159.6	25.5	38.4	245.8	40.3
LOS	F	D	A	F	C	B	D	F	C	D	F	D
Approach Delay		49.6			63.8			115.7			186.9	
Approach LOS		D			E			F			F	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT, Start of Yellow
 Natural Cycle: 125
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.45
 Intersection Signal Delay: 116.2
 Intersection LOS: F
 Intersection Capacity Utilization 113.6%
 ICU Level of Service H
 Analysis Period (min) 15

Splits and Phases: 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.



HCM Signalized Intersection Capacity Analysis
 16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

Gateway South Building 4 TIA (JN 10187)

3/30/2017



























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	504	158	286	260	517	233	964	319	55	1087	381
Future Volume (vph)	105	504	158	286	260	517	233	964	319	55	1087	381
Ideal Flow (vphpl)	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Lane Util. Factor	1.00	0.95	1.00	0.97	0.91	0.91	0.91	0.91	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	0.99	0.99	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	3200	3600	1377	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	3200	3600	1377	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	115	554	174	314	286	568	256	1059	351	60	1195	419
RTOR Reduction (vph)	0	0	28	0	150	26	0	0	130	0	0	115
Lane Group Flow (vph)	115	554	146	314	420	258	230	1085	221	60	1195	304
Confl. Peds. (#/hr)			4			7			2			
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2	8	1	6	4	8	8		4	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	7.4	35.3	64.3	9.4	37.3	64.7	29.0	29.0	29.0	27.4	27.4	27.4
Effective Green, g (s)	7.4	35.3	64.3	9.4	37.3	64.7	29.0	29.0	29.0	27.4	27.4	27.4
Actuated g/C Ratio	0.06	0.29	0.54	0.08	0.31	0.54	0.24	0.24	0.24	0.23	0.23	0.23
Clearance Time (s)	4.6	5.1	4.6	4.6	5.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	104	1059	1033	250	1119	742	410	870	435	388	822	411
v/s Ratio Prot	c0.07	c0.15	0.03	c0.10	0.12	0.08	0.14	c0.30		0.04	c0.33	
v/s Ratio Perm			0.05			0.11			0.12			0.17
v/c Ratio	1.11	0.52	0.14	1.26	0.38	0.35	0.56	1.25	0.51	0.15	1.45	0.74
Uniform Delay, d1	56.3	35.3	14.0	55.3	32.3	15.7	39.9	45.5	39.3	37.0	46.3	43.0
Progression Factor	1.10	1.08	1.19	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	102.6	1.2	0.2	143.5	0.2	0.3	5.5	120.8	4.2	0.8	211.0	11.3
Delay (s)	164.4	39.5	16.9	198.8	32.5	16.0	45.4	166.3	43.5	37.9	257.3	54.3
Level of Service	F	D	B	F	C	B	D	F	D	D	F	D
Approach Delay (s)		51.9			73.2			123.7			198.6	
Approach LOS		D			E			F			F	

Intersection Summary

HCM 2000 Control Delay	124.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.9
Intersection Capacity Utilization	113.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	504	158	286	260	517	233	964	319	55	1087	381
Future Volume (veh/h)	105	504	158	286	260	517	233	964	319	55	1087	381
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1600	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	115	554	131	314	286	541	256	1059	316	60	1195	382
Adj No. of Lanes	1	2	1	2	1	2	1	2	1	1	2	1
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	100	1006	818	658	814	2044	391	870	369	370	781	349
Arrive On Green	0.12	0.59	0.59	0.22	0.45	0.45	0.24	0.24	0.24	0.23	0.23	0.23
Sat Flow, veh/h	1619	3420	1524	3048	1800	2973	1619	3600	1526	1619	3420	1530
Grp Volume(v), veh/h	115	554	131	314	286	541	256	1059	316	60	1195	382
Grp Sat Flow(s),veh/h/ln	1619	1710	1524	1524	1800	1487	1619	1800	1526	1619	1710	1530
Q Serve(g_s), s	7.4	11.8	3.4	10.8	12.4	8.5	17.1	29.0	23.8	3.6	27.4	27.4
Cycle Q Clear(g_c), s	7.4	11.8	3.4	10.8	12.4	8.5	17.1	29.0	23.8	3.6	27.4	27.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	100	1006	818	658	815	2044	391	870	369	370	781	349
V/C Ratio(X)	1.15	0.55	0.16	0.48	0.35	0.26	0.65	1.22	0.86	0.16	1.53	1.09
Avail Cap(c_a), veh/h	100	1006	818	658	814	2044	391	870	369	370	781	349
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.55	0.55	0.55	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.6	19.9	8.0	41.1	21.4	7.5	41.0	45.5	43.5	37.1	46.3	46.3
Incr Delay (d2), s/veh	113.6	1.2	0.2	0.2	0.3	0.1	8.3	108.2	21.8	0.9	245.1	75.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	5.7	2.2	4.6	6.2	6.0	8.5	27.5	12.2	1.7	39.5	18.9
LnGrp Delay(d),s/veh	166.2	21.1	8.2	41.3	21.6	7.5	49.3	153.7	65.3	38.0	291.4	121.9
LnGrp LOS	F	C	A	D	C	A	D	F	E	D	F	F
Approach Vol, veh/h		800			1141			1631			1637	
Approach Delay, s/veh		39.8			20.4			120.2			242.6	
Approach LOS		D			C			F			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	31.5	40.4		32.0	12.0	59.9		33.6				
Change Period (Y+Rc), s	5.1	* 5.1		4.6	4.6	5.1		4.6				
Max Green Setting (Gmax), s	9.4	* 35		27.4	7.4	37.3		29.0				
Max Q Clear Time (g_c+I1), s	12.8	13.8		29.4	9.4	14.4		31.0				
Green Ext Time (p_c), s	0.0	4.0		0.0	0.0	4.7		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	124.4											
HCM 2010 LOS	F											
Notes												

APPENDIX 8.3:

**HORIZON YEAR (2040) WITHOUT PROJECT CONDITIONS TRAFFIC SIGNAL WARRANT
ANALYSIS WORKSHEETS**

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Figure 4C-3. Warrant 3, Peak Hour

Traffic Conditions = **Horizon Year (2040) Without Project Conditions - Weekday PM Peak Hour**

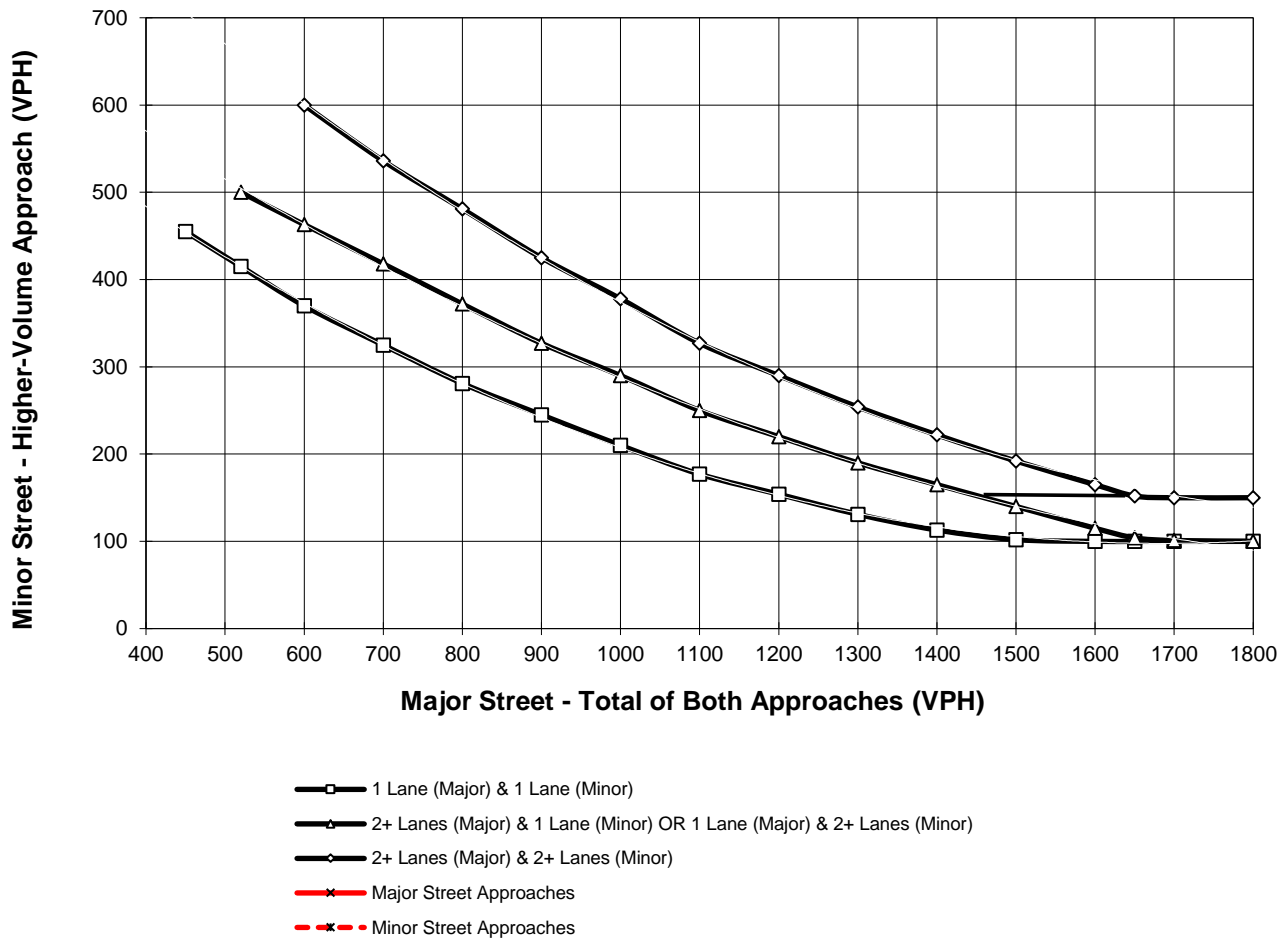
Major Street Name = **Dumas St.**

Total of Both Approaches (VPH) = **33**
 Number of Approach Lanes on Major Street = **1**

Minor Street Name = **Washington Av.**

High Volume Approach (VPH) = **23**
 Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 150 vph applies as the lower threshold for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **Horizon Year (2040) Without Project Conditions - Weekday AM Peak Hour**

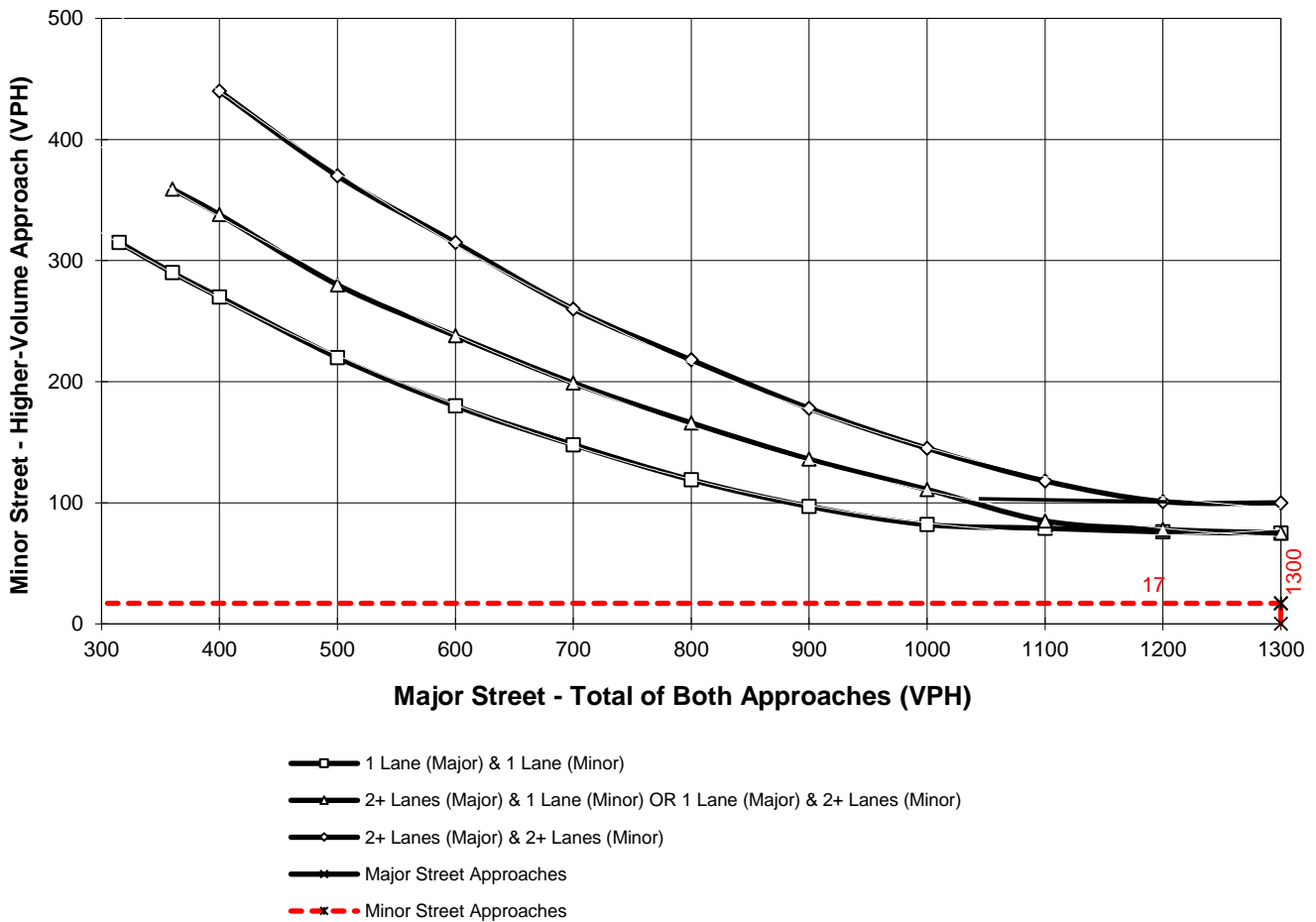
Major Street Name = **Waterman Av.**

Total of Both Approaches (VPH) = **2333**
 Number of Approach Lanes Major Street = **2**

Minor Street Name = **Dumas St.**

High Volume Approach (VPH) = **17**
 Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

APPENDIX 8.4:

**HORIZON YEAR (2040) WITH PROJECT CONDITIONS TRAFFIC SIGNAL WARRANT
ANALYSIS WORKSHEETS**

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Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

<u>DIST</u>	<u>CO</u>	<u>RTE</u>	<u>PM</u>	<u>CALC</u>	<u>TRAFFIC CONDITIONS</u>	<u>2040 WP</u>
Jurisdiction: <u>City of San Bernardino</u>				CHK <u>CHS</u>	DATE <u>07/06/16</u>	DATE <u>07/06/16</u>
Major Street: <u>Washington Avenue</u>					Critical Approach Speed (Major) <u>25</u> mph	
Minor Street: <u>Driveway 1</u>					Critical Approach Speed (Minor) <u>25</u> mph	

Major Street Approach Lanes = 1 lane Minor Street Approach Lanes: 1 lane

Major Street Future ADT = 1,038 vpd Minor Street Future ADT = 367 vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph);

or

In built up area of isolated community of < 10,000 population **URBAN (U)**

(Based on Estimated Average Daily Traffic - See Note)

<u>URBAN</u>	<u>RURAL</u>	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
<u>Satisfied</u>	<u>Not Satisfied</u>				
	XX				
Number of lanes for moving traffic on each approach					
<u>Major Street</u>	<u>Minor Street</u>	<u>Urban</u>	<u>Rural</u>	<u>Urban</u>	<u>Rural</u>
1 1,038	1 367	8,000	5,600	2,400	1,680
2 +	1	9,600	6,720	2,400	1,680
2 +	2 +	9,600	6,720	3,200	2,240
1	2 +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
<u>Satisfied</u>	<u>Not Satisfied</u>				
	XX				
Number of lanes for moving traffic on each approach					
<u>Major Street</u>	<u>Minor Street</u>	<u>Urban</u>	<u>Rural</u>	<u>Urban</u>	<u>Rural</u>
1 1,038	1 367	12,000	8,400	1,200	850
2 +	1	14,400	10,080	1,200	850
2 +	2 +	14,400	10,080	1,600	1,120
1	2 +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B		2 CONDITIONS 80%		2 CONDITIONS 80%	
<u>Satisfied</u>	<u>Not Satisfied</u>				
No one condition satisfied, but following conditions fulfilled 80% of more	XX				
	A				
	13%				
	B				
	9%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.



Figure 4C-3. Warrant 3, Peak Hour

Traffic Conditions = **Horizon Year (2040) With Project Conditions - Weekday PM Peak Hour**

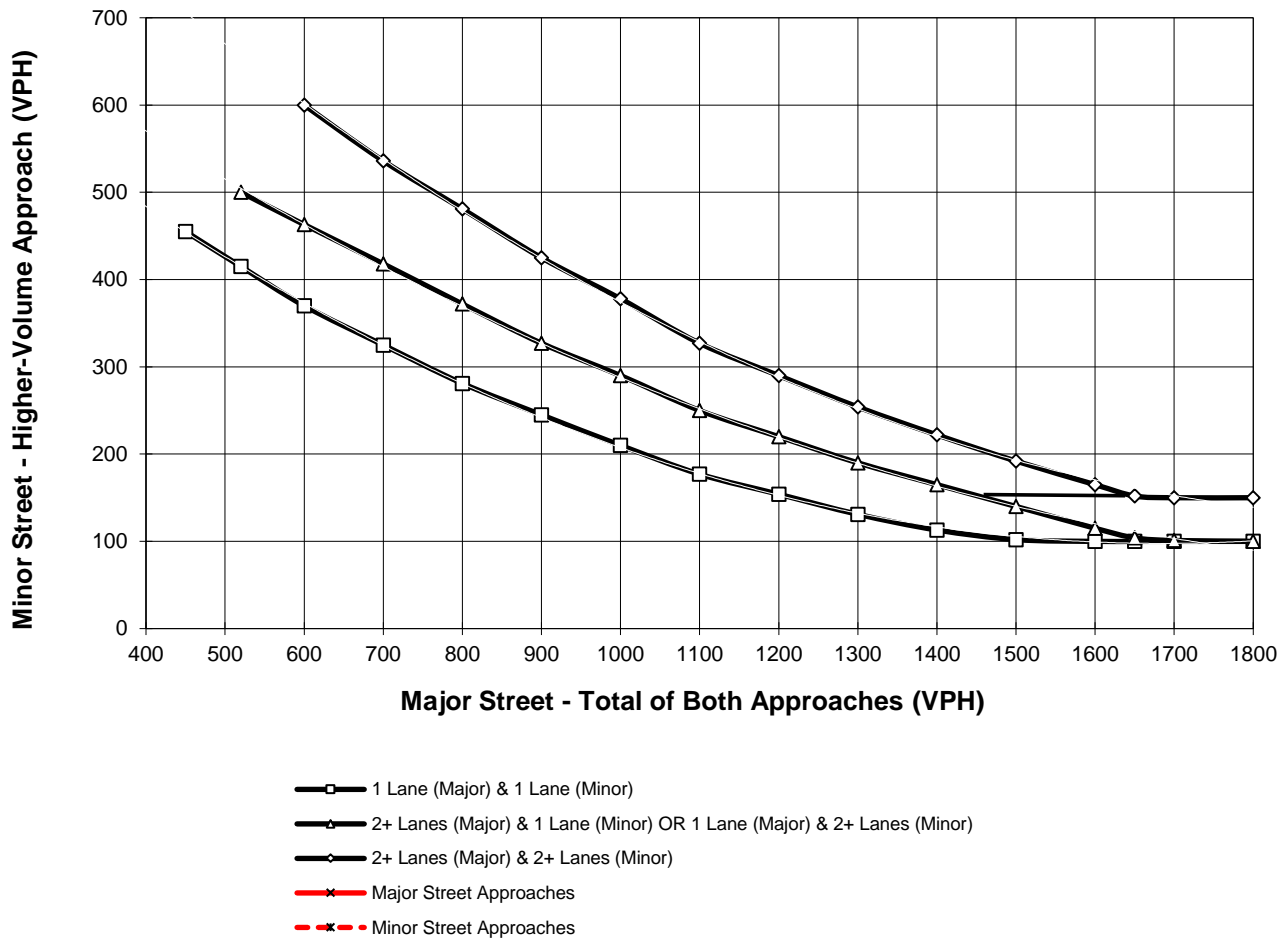
Major Street Name = **Dumas St.**

Total of Both Approaches (VPH) = **33**
 Number of Approach Lanes on Major Street = **1**

Minor Street Name = **Washington Av.**

High Volume Approach (VPH) = **23**
 Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 150 vph applies as the lower threshold for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-3. Warrant 3, Peak Hour

Traffic Conditions = **Horizon Year (2040) With Project (Alternative Access) - Weekday PM Peak Hour**

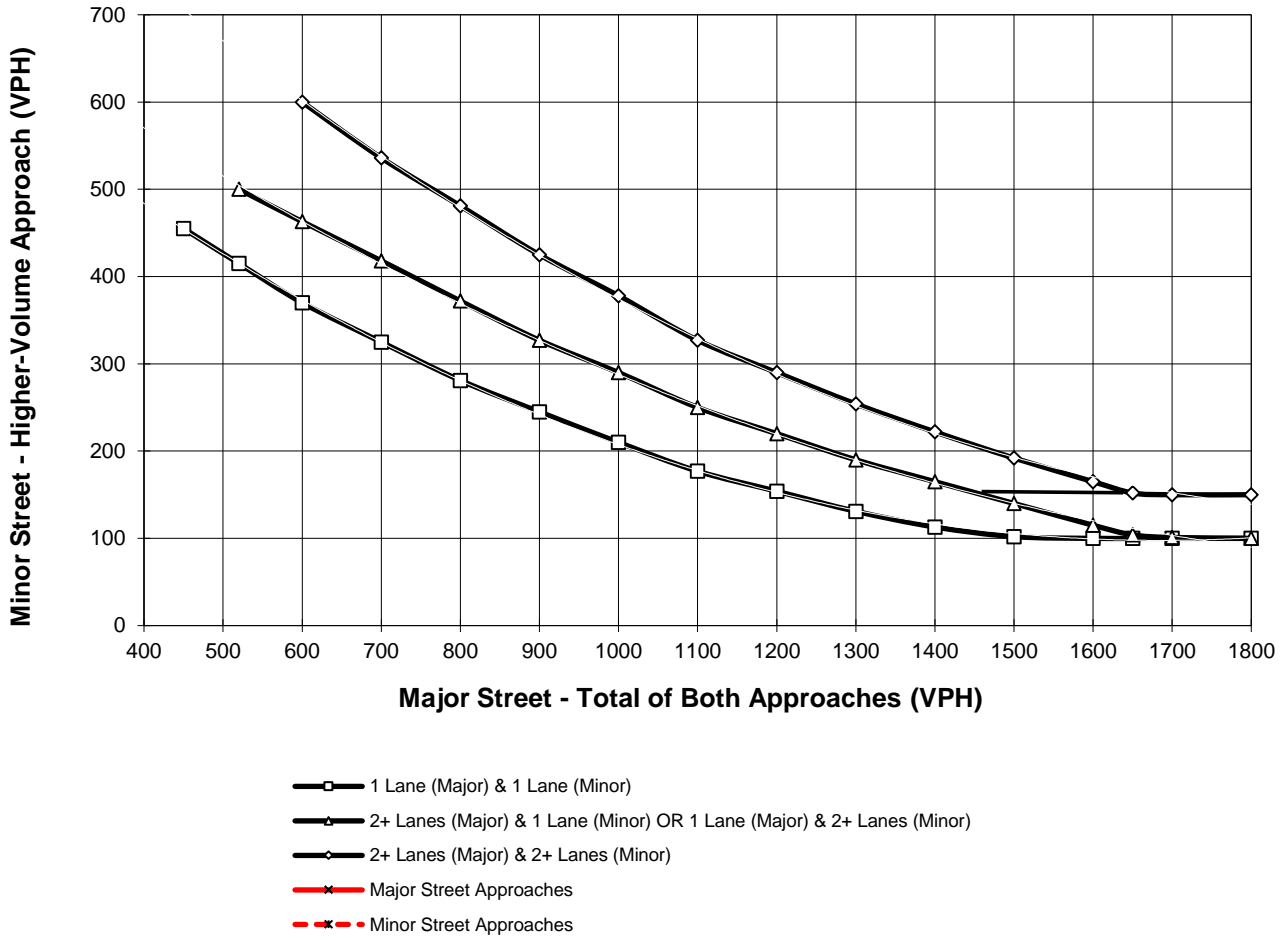
Major Street Name = **Washington Av.**

Total of Both Approaches (VPH) = **66**
 Number of Approach Lanes on Major Street = **1**

Minor Street Name = **Dumas St.**

High Volume Approach (VPH) = **33**
 Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 150 vph applies as the lower threshold for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold for a minor-street approach with one lane



Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **Horizon Year (2040) With Project Conditions - Weekday AM Peak Hour**

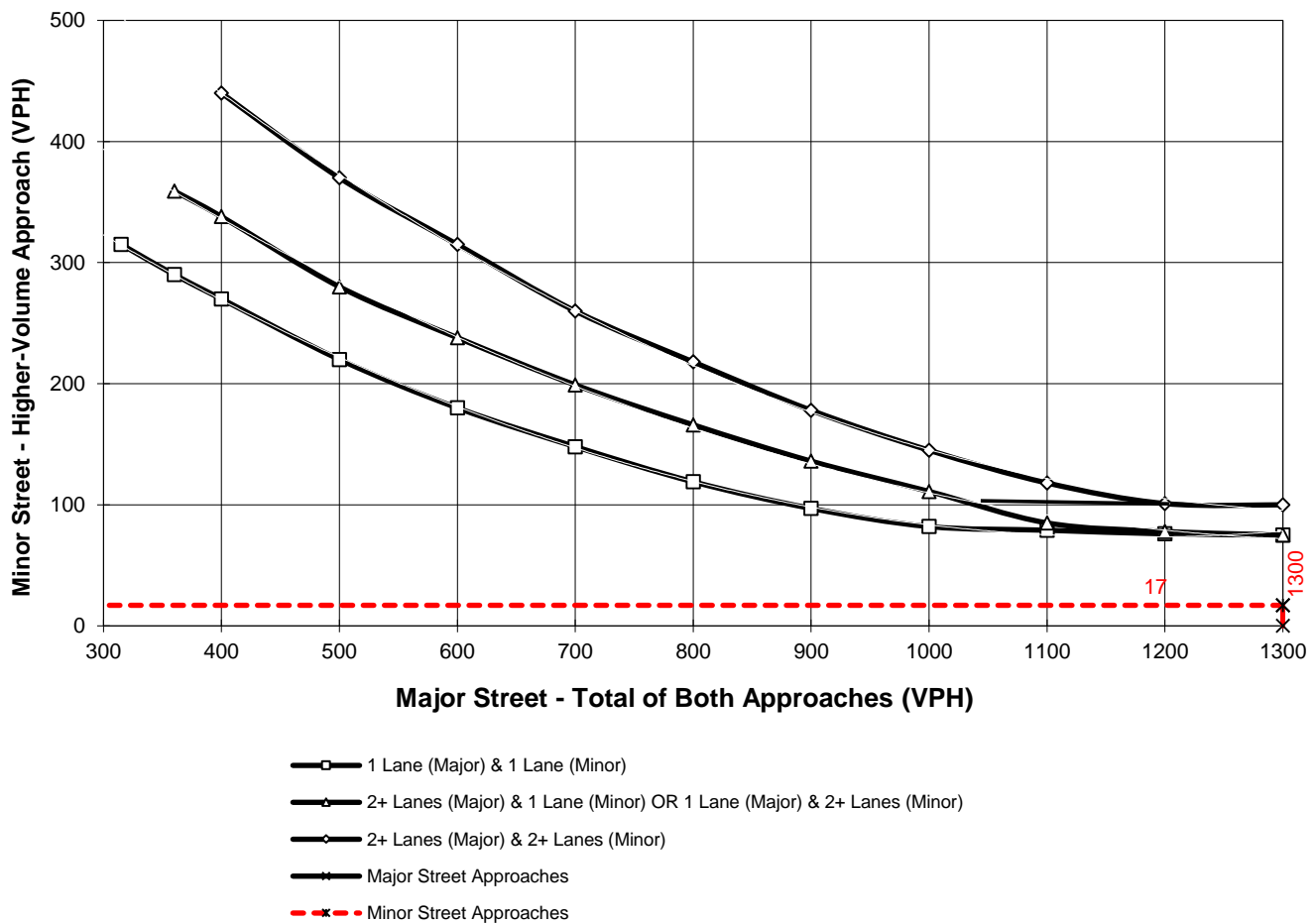
Major Street Name = **Waterman Av.**

Total of Both Approaches (VPH) = **2397**
 Number of Approach Lanes Major Street = **2**

Minor Street Name = **Dumas St.**

High Volume Approach (VPH) = **17**
 Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

APPENDIX 8.5:

**HORIZON YEAR (2040) WITHOUT PROJECT CONDITIONS OFF-RAMP QUEUING
ANALYSIS WORKSHEETS**

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Queues

1: I-215 SB Ramps & Auto Center Rd.



Lane Group	EBT	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	527	614	752	765	304
v/c Ratio	0.34	0.41	1.06	1.02	0.36
Control Delay	10.4	12.4	72.9	59.2	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.4	12.4	72.9	59.2	7.2
Queue Length 50th (ft)	52	80	~326	~292	32
Queue Length 95th (ft)	84	131	#522	#515	78
Internal Link Dist (ft)	663	209		2403	
Turn Bay Length (ft)					465
Base Capacity (vph)	1553	1500	708	750	841
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.34	0.41	1.06	1.02	0.36

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	199	1734	623	463	244	249	1152
v/c Ratio	1.12	0.85	0.43	0.46	0.54	0.52	1.12
Control Delay	112.4	12.4	19.5	10.7	24.1	23.3	87.9
Queue Delay	0.0	18.5	0.0	0.0	0.0	0.0	0.6
Total Delay	112.4	30.9	19.5	10.7	24.1	23.3	88.5
Queue Length 50th (ft)	~81	322	177	146	78	80	~265
Queue Length 95th (ft)	m#103	m324	216	208	145	145	#390
Internal Link Dist (ft)		295	473			974	
Turn Bay Length (ft)	270			230	315		275
Base Capacity (vph)	178	2040	1452	1002	453	480	1033
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	353	0	0	0	0	112
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.12	1.03	0.43	0.46	0.54	0.52	1.25

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.



Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	660	45	670	28	628	640	832
v/c Ratio	0.73	0.42	0.56	0.11	0.69	0.66	0.79
Control Delay	47.8	65.9	34.9	0.9	26.6	25.3	23.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.8	65.9	34.9	0.9	26.6	25.3	23.9
Queue Length 50th (ft)	252	34	222	0	390	389	421
Queue Length 95th (ft)	#348	73	284	0	550	540	623
Internal Link Dist (ft)	873		790			811	
Turn Bay Length (ft)		150			100		215
Base Capacity (vph)	898	136	1200	252	909	964	1057
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.33	0.56	0.11	0.69	0.66	0.79

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Queues
16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	131	211	84	61	853	395	970	233	9	756	131
v/c Ratio	0.43	0.16	0.07	0.33	0.79	0.88	1.02	0.39	0.03	1.28	0.30
Control Delay	48.0	25.3	1.2	54.4	27.0	61.2	75.4	12.9	39.2	178.4	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	25.3	1.2	54.4	27.0	61.2	75.4	12.9	39.2	178.4	5.1
Queue Length 50th (ft)	83	54	0	21	171	294	-401	38	5	-357	0
Queue Length 95th (ft)	#202	84	11	43	215	#485	#536	105	20	#480	32
Internal Link Dist (ft)		1015			1164		440			335	
Turn Bay Length (ft)	85		270	250		800		160	110		110
Base Capacity (vph)	308	1297	1177	212	1395	448	949	594	278	589	430
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.16	0.07	0.29	0.61	0.88	1.02	0.39	0.03	1.28	0.30

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

1: I-215 SB Ramps & Auto Center Rd.



Lane Group	EBT	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	744	548	493	499	185
v/c Ratio	0.45	0.36	0.71	0.68	0.22
Control Delay	9.3	6.7	21.7	20.1	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	9.3	6.7	21.7	20.1	2.9
Queue Length 50th (ft)	63	27	149	148	0
Queue Length 95th (ft)	102	m26	#255	250	30
Internal Link Dist (ft)	663	209		2403	
Turn Bay Length (ft)					465
Base Capacity (vph)	1653	1524	697	738	847
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.45	0.36	0.71	0.68	0.22

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	202	1143	1549	845	96	106	779
v/c Ratio	1.13	0.56	1.07	0.82	0.21	0.22	0.74
Control Delay	132.2	5.3	55.0	9.7	18.7	18.7	21.6
Queue Delay	0.0	0.1	0.0	0.5	0.0	0.0	0.1
Total Delay	132.2	5.4	55.0	10.1	18.7	18.7	21.7
Queue Length 50th (ft)	~81	28	~393	118	28	31	120
Queue Length 95th (ft)	m#170	66	m283	m103	63	67	182
Internal Link Dist (ft)		295	473			974	
Turn Bay Length (ft)	270			230	315		275
Base Capacity (vph)	178	2040	1452	1036	453	480	1055
Starvation Cap Reductn	0	0	0	30	0	0	0
Spillback Cap Reductn	0	124	0	0	0	0	20
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.13	0.60	1.07	0.84	0.21	0.22	0.75

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Queues

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.



Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	995	29	851	84	420	421	453
v/c Ratio	0.71	0.35	0.53	0.41	0.62	0.58	0.51
Control Delay	34.9	66.6	25.6	9.3	34.4	33.1	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	66.6	25.6	9.3	34.4	33.1	12.6
Queue Length 50th (ft)	358	22	246	0	275	271	95
Queue Length 95th (ft)	441	55	306	20	406	395	199
Internal Link Dist (ft)	873		790			811	
Turn Bay Length (ft)		150			100		215
Base Capacity (vph)	1411	90	1608	283	681	721	886
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.32	0.53	0.30	0.62	0.58	0.51

Intersection Summary

Queues
16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	115	554	164	314	845	224	1084	351	60	1195	402
v/c Ratio	1.11	0.52	0.15	1.26	0.60	0.55	1.25	0.62	0.15	1.45	0.77
Control Delay	158.1	40.3	9.1	188.3	18.4	45.6	159.1	25.5	38.4	245.8	37.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	158.1	40.3	9.1	188.3	18.4	45.6	159.1	25.5	38.4	245.8	37.6
Queue Length 50th (ft)	~104	185	56	~156	141	167	~574	123	37	~665	188
Queue Length 95th (ft)	m#180	m224	m71	#250	207	258	#715	227	76	#801	311
Internal Link Dist (ft)		1015			1164		440			335	
Turn Bay Length (ft)	85		270	250		800		160	110		110
Base Capacity (vph)	104	1059	1066	250	1413	410	870	565	388	822	525
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.11	0.52	0.15	1.26	0.60	0.55	1.25	0.62	0.15	1.45	0.77

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

APPENDIX 8.6:

**HORIZON YEAR (2040) WITH PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS
WORKSHEETS**

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Queues

1: I-215 SB Ramps & Auto Center Rd.



Lane Group	EBT	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	529	615	765	778	304
v/c Ratio	0.34	0.41	1.08	1.04	0.36
Control Delay	10.5	12.6	79.1	64.1	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.5	12.6	79.1	64.1	7.2
Queue Length 50th (ft)	53	82	~336	~330	32
Queue Length 95th (ft)	84	133	#533	#528	78
Internal Link Dist (ft)	663	209		2403	
Turn Bay Length (ft)					465
Base Capacity (vph)	1552	1500	708	750	841
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.34	0.41	1.08	1.04	0.36

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	199	1763	637	474	244	249	1182
v/c Ratio	1.12	0.86	0.44	0.47	0.54	0.52	1.14
Control Delay	111.3	12.8	19.8	11.0	24.1	23.3	99.3
Queue Delay	0.0	36.3	0.0	0.0	0.0	0.0	0.6
Total Delay	111.3	49.1	19.8	11.0	24.1	23.3	99.9
Queue Length 50th (ft)	~81	328	183	153	78	80	~279
Queue Length 95th (ft)	m#100	m325	226	247	145	145	#405
Internal Link Dist (ft)		295	473			974	
Turn Bay Length (ft)	270			230	315		275
Base Capacity (vph)	178	2040	1452	1008	453	480	1033
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	400	0	0	0	0	113
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.12	1.07	0.44	0.47	0.54	0.52	1.28

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Queues

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.



Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	660	45	670	28	628	640	832
v/c Ratio	0.73	0.42	0.56	0.11	0.69	0.66	0.79
Control Delay	47.8	65.9	34.9	0.9	26.6	25.3	23.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.8	65.9	34.9	0.9	26.6	25.3	23.9
Queue Length 50th (ft)	252	34	222	0	390	389	421
Queue Length 95th (ft)	#348	73	284	0	550	540	623
Internal Link Dist (ft)	873		790			811	
Turn Bay Length (ft)		150			100		215
Base Capacity (vph)	898	136	1200	252	909	964	1057
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.33	0.56	0.11	0.69	0.66	0.79

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Queues

16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.

3/24/2017



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	131	211	87	61	867	406	971	233	9	756	136
v/c Ratio	0.43	0.16	0.07	0.33	0.79	0.91	1.02	0.39	0.03	1.28	0.32
Control Delay	48.4	25.3	1.2	54.4	27.3	64.8	75.7	12.9	39.2	178.4	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.4	25.3	1.2	54.4	27.3	64.8	75.7	12.9	39.2	178.4	5.8
Queue Length 50th (ft)	83	54	0	21	175	305	-401	38	5	-357	0
Queue Length 95th (ft)	#202	84	11	43	221	#504	#536	105	20	#480	36
Internal Link Dist (ft)		1015			1164		440			335	
Turn Bay Length (ft)	85		270	250		800		160	110		110
Base Capacity (vph)	303	1297	1178	212	1395	448	949	594	278	589	430
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.16	0.07	0.29	0.62	0.91	1.02	0.39	0.03	1.28	0.32

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

1: I-215 SB Ramps & Auto Center Rd.



Lane Group	EBT	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	745	550	500	504	185
v/c Ratio	0.45	0.36	0.72	0.68	0.22
Control Delay	9.3	6.5	22.2	20.3	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	9.3	6.5	22.2	20.3	2.9
Queue Length 50th (ft)	63	27	152	150	0
Queue Length 95th (ft)	102	m26	#267	252	30
Internal Link Dist (ft)	663	209		2403	
Turn Bay Length (ft)					465
Base Capacity (vph)	1653	1524	697	738	847
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.45	0.36	0.72	0.68	0.22

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

2: I-215 NB Ramps & Auto Center Rd./Orange Show Rd.



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	202	1156	1585	873	96	106	794
v/c Ratio	1.30	0.57	1.06	0.82	0.21	0.22	0.75
Control Delay	197.8	5.3	49.2	9.9	18.7	18.7	22.4
Queue Delay	0.0	0.1	0.0	0.5	0.0	0.0	0.2
Total Delay	197.8	5.4	49.2	10.5	18.7	18.7	22.6
Queue Length 50th (ft)	~90	28	~393	126	28	31	124
Queue Length 95th (ft)	m#178	66	m272	m107	63	67	188
Internal Link Dist (ft)		295	473			974	
Turn Bay Length (ft)	270			230	315		275
Base Capacity (vph)	155	2040	1500	1059	453	480	1052
Starvation Cap Reductn	0	0	0	31	0	0	0
Spillback Cap Reductn	0	134	0	0	0	0	20
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.30	0.61	1.06	0.85	0.21	0.22	0.77

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Queues

8: Club Center Drive/I-10 EB Off Ramp & Redlands Bl./Redlands Bl.



Lane Group	EBT	WBL	WBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	995	29	851	84	420	421	453
v/c Ratio	0.71	0.35	0.53	0.41	0.62	0.58	0.51
Control Delay	34.9	66.6	25.6	9.3	34.4	33.1	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	66.6	25.6	9.3	34.4	33.1	12.6
Queue Length 50th (ft)	358	22	246	0	275	271	95
Queue Length 95th (ft)	441	55	306	20	406	395	199
Internal Link Dist (ft)	873		790			811	
Turn Bay Length (ft)		150			100		215
Base Capacity (vph)	1411	90	1608	283	681	721	886
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.32	0.53	0.30	0.62	0.58	0.51

Intersection Summary

Queues
16: I-10 WB Ramps/Carnegie Dr. & Hospitality Ln.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	115	554	174	314	854	230	1085	351	60	1195	419
v/c Ratio	1.11	0.52	0.16	1.26	0.60	0.56	1.25	0.62	0.15	1.45	0.80
Control Delay	157.8	39.8	9.3	188.3	18.4	46.1	159.6	25.5	38.4	245.8	40.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	157.8	39.8	9.3	188.3	18.4	46.1	159.6	25.5	38.4	245.8	40.3
Queue Length 50th (ft)	~105	181	60	~156	142	172	~575	123	37	~665	204
Queue Length 95th (ft)	m#177	m218	m75	#250	208	265	#716	227	76	#801	#356
Internal Link Dist (ft)		1015			1164		440			335	
Turn Bay Length (ft)	85		270	250		800		160	110		110
Base Capacity (vph)	104	1059	1066	250	1418	410	870	565	388	822	525
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.11	0.52	0.16	1.26	0.60	0.56	1.25	0.62	0.15	1.45	0.80

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

APPENDIX 8.7:

**WATERMAN AVENUE AND ORANGE SHOW ROAD PEAK HOUR QUEUING ANALYSIS
FOR HORIZON YEAR (2040) WITH PROJECT CONDITIONS**

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Queuing and Blocking Report
 Horizon Year (2040) With Project - AM Peak Hour

3/28/2017

Intersection: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	R	L	T	T	R	L
Maximum Queue (ft)	254	228	218	293	273	340	89	240	285	313	64	301
Average Queue (ft)	136	109	113	122	118	168	23	125	182	190	26	124
95th Queue (ft)	221	183	180	229	217	283	56	210	260	268	52	253
Link Distance (ft)		1440	1440	1440		2230	2230		657	657	657	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	210				210			225				250
Storage Blk Time (%)	2	0			2	5		1	3			0
Queuing Penalty (veh)	5	0			8	7		5	3			1

Intersection: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	482	461	55
Average Queue (ft)	280	254	26
95th Queue (ft)	430	408	48
Link Distance (ft)	1268	1268	1268
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)	16		
Queuing Penalty (veh)	16		

Queuing and Blocking Report
 Horizon Year (2040) With Project - PM Peak Hour

3/28/2017

Intersection: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	R	L	T	T	R	L
Maximum Queue (ft)	290	628	582	161	305	2245	2245	340	673	648	124	320
Average Queue (ft)	246	353	328	57	301	2245	2235	338	641	404	58	218
95th Queue (ft)	342	684	641	120	326	2249	2326	359	749	676	103	391
Link Distance (ft)		1440	1440	1440		2230	2230		657	657	657	
Upstream Blk Time (%)						100	55		54	1		
Queuing Penalty (veh)						0	0		276	6		
Storage Bay Dist (ft)	210				210			225				250
Storage Blk Time (%)	51	5			92	46		88	17			0
Queuing Penalty (veh)	217	11			561	95		450	54			0

Intersection: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	682	655	179
Average Queue (ft)	431	404	38
95th Queue (ft)	654	613	121
Link Distance (ft)	1268	1268	1268
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)	46		
Queuing Penalty (veh)	65		

Queuing and Blocking Report
 2040 WP - PM Peak Hour WITH IMPROVEMENTS

4/4/2017

Intersection: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	R	L	L	T	T	R
Maximum Queue (ft)	290	1309	1289	398	305	2239	2239	218	340	497	500	124
Average Queue (ft)	284	980	928	82	250	2224	2149	122	169	289	301	53
95th Queue (ft)	323	1645	1584	414	402	2367	2752	186	318	436	436	102
Link Distance (ft)		1475	1475	1475		2224	2224			657	657	657
Upstream Blk Time (%)		10	1	0		91	52					
Queuing Penalty (veh)		0	0	0		0	0					
Storage Bay Dist (ft)	210				210			225	225			
Storage Blk Time (%)	86	18			8	70		0	0	19		
Queuing Penalty (veh)	367	43			49	145		1	1	59		

Intersection: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	319	449	417	80
Average Queue (ft)	129	286	264	37
95th Queue (ft)	268	409	382	65
Link Distance (ft)		1268	1268	1268
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	250			
Storage Blk Time (%)	0	18		
Queuing Penalty (veh)	0	26		

APPENDIX 8.9:

**HORIZON YEAR (2040) WITHOUT PROJECT CONDITIONS INTERSECTION OPERATIONS
ANALYSIS WORKSHEETS WITH IMPROVEMENTS**

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Timings
3: E St. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/28/2017

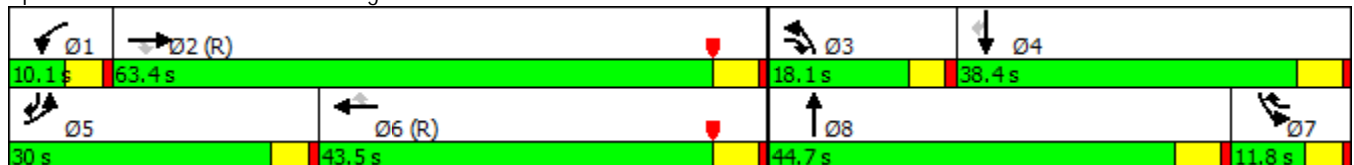


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑	↗	↔↔	↑↑	↗	↔↔	↑↑	↔↔	↑↑	↗
Traffic Volume (vph)	429	1345	808	98	574	68	137	201	74	230	202
Future Volume (vph)	429	1345	808	98	574	68	137	201	74	230	202
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	7	4	5
Permitted Phases			2			6					4
Detector Phase	5	2	3	1	6	7	3	8	7	4	5
Switch Phase											
Minimum Initial (s)	5.0	10.0	5.0	5.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0
Minimum Split (s)	9.6	39.4	9.6	9.6	39.4	9.6	9.6	38.4	9.6	38.4	9.6
Total Split (s)	30.0	63.4	18.1	10.1	43.5	11.8	18.1	44.7	11.8	38.4	30.0
Total Split (%)	23.1%	48.8%	13.9%	7.8%	33.5%	9.1%	13.9%	34.4%	9.1%	29.5%	23.1%
Yellow Time (s)	3.6	4.4	3.6	3.6	4.4	3.6	3.6	4.4	3.6	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	4.6	5.4	4.6	4.6	5.4	4.6	5.4	4.6
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max	None	None	Max	None	Max	None
Act Effct Green (s)	22.3	58.0	76.6	5.5	41.2	49.2	13.2	39.3	7.2	33.3	60.9
Actuated g/C Ratio	0.17	0.45	0.59	0.04	0.32	0.38	0.10	0.30	0.06	0.26	0.47
v/c Ratio	0.84	0.90	0.75	0.78	0.54	0.10	0.91	0.30	0.45	0.27	0.25
Control Delay	65.5	42.0	18.5	90.8	56.7	8.3	104.9	25.9	67.4	39.6	13.5
Queue Delay	0.0	46.5	13.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.5	88.4	32.5	90.8	56.7	8.3	104.9	25.9	67.4	39.6	13.5
LOS	E	F	C	F	E	A	F	C	E	D	B
Approach Delay		67.1			56.8			49.7		33.2	
Approach LOS		E			E			D		C	

Intersection Summary

Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 110
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 59.5
 Intersection LOS: E
 Intersection Capacity Utilization 89.7%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 3: E St. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
3: E St. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/28/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	429	1345	808	98	574	68	137	201	119	74	230	202	
Future Volume (vph)	429	1345	808	98	574	68	137	201	119	74	230	202	
Ideal Flow (vphp)	1700	1900	1900	1700	1900	1900	1700	1900	1800	1700	1900	1900	
Total Lost time (s)	4.6	5.4	4.6	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6	
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	0.95	1.00	
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99		1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	3400	3800	1900	3400	3800	1900	1700	3800		3400	3800	1900	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	3400	3800	1900	3400	3800	1900	1700	3800		3400	3800	1900	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	
Adj. Flow (vph)	488	1528	918	111	652	77	156	228	135	84	261	230	
RTOR Reduction (vph)	0	0	110	0	0	48	0	67	0	0	0	46	
Lane Group Flow (vph)	488	1528	808	111	652	29	156	296	0	84	261	184	
Confl. Peds. (#/hr)									2				
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov	
Protected Phases	5	2	3	1	6	7	3	8		7	4	5	
Permitted Phases			2			6						4	
Actuated Green, G (s)	22.3	58.0	71.2	5.5	41.2	48.4	13.2	39.3		7.2	33.3	55.6	
Effective Green, g (s)	22.3	58.0	71.2	5.5	41.2	48.4	13.2	39.3		7.2	33.3	55.6	
Actuated g/C Ratio	0.17	0.45	0.55	0.04	0.32	0.37	0.10	0.30		0.06	0.26	0.43	
Clearance Time (s)	4.6	5.4	4.6	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6	
Vehicle Extension (s)	2.0	4.0	2.0	2.0	4.0	2.0	2.0	3.0		2.0	3.0	2.0	
Lane Grp Cap (vph)	583	1695	1040	143	1204	707	172	1148		188	973	812	
v/s Ratio Prot	c0.14	c0.40	0.08	0.03	0.17	0.00	c0.09	0.08		c0.02	c0.07	0.04	
v/s Ratio Perm			0.35			0.01						0.06	
v/c Ratio	0.84	0.90	0.78	0.78	0.54	0.04	0.91	0.26		0.45	0.27	0.23	
Uniform Delay, d1	52.1	33.4	23.1	61.6	36.6	26.0	57.8	34.3		59.5	38.6	23.6	
Progression Factor	1.00	1.00	1.00	0.98	1.47	1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2	9.7	8.2	3.4	19.1	1.6	0.0	41.8	0.5		0.6	0.7	0.1	
Delay (s)	61.8	41.6	26.5	79.7	55.5	26.0	99.6	34.9		60.1	39.3	23.6	
Level of Service	E	D	C	E	E	C	F	C		E	D	C	
Approach Delay (s)		40.2			56.0			54.3			36.1		
Approach LOS		D			E			D			D		
Intersection Summary													
HCM 2000 Control Delay			44.0									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.73										
Actuated Cycle Length (s)			130.0									Sum of lost time (s)	20.0
Intersection Capacity Utilization			89.7%									ICU Level of Service	E
Analysis Period (min)			15										
c Critical Lane Group													

HCM 2010 Signalized Intersection Summary
 3: E St. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/28/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	429	1345	808	98	574	68	137	201	119	74	230	202
Future Volume (veh/h)	429	1345	808	98	574	68	137	201	119	74	230	202
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1900	1900	1700	1900	1900	1700	1900	1800	1700	1900	1900
Adj Flow Rate, veh/h	488	1528	667	111	652	46	156	228	103	84	261	208
Adj No. of Lanes	2	2	1	2	2	1	2	2	0	2	2	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	537	1643	840	133	1179	592	204	739	323	126	1024	734
Arrive On Green	0.17	0.46	0.46	0.08	0.65	0.65	0.06	0.30	0.30	0.04	0.28	0.28
Sat Flow, veh/h	3141	3610	1615	3141	3610	1615	3141	2445	1069	3141	3610	1615
Grp Volume(v), veh/h	488	1528	667	111	652	46	156	166	165	84	261	208
Grp Sat Flow(s),veh/h/ln	1570	1805	1615	1570	1805	1615	1570	1805	1709	1570	1805	1615
Q Serve(g_s), s	19.8	52.0	43.9	4.5	12.7	0.4	6.4	9.2	9.7	3.4	7.3	10.5
Cycle Q Clear(g_c), s	19.8	52.0	43.9	4.5	12.7	0.4	6.4	9.2	9.7	3.4	7.3	10.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.63	1.00		1.00
Lane Grp Cap(c), veh/h	537	1643	840	133	1179	592	204	546	517	126	1024	734
V/C Ratio(X)	0.91	0.93	0.79	0.84	0.55	0.08	0.77	0.30	0.32	0.67	0.25	0.28
Avail Cap(c_a), veh/h	614	1643	840	133	1179	592	326	546	517	174	1024	734
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.19	0.19	0.19	0.87	0.87	0.87	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.9	33.4	25.5	59.1	17.4	5.5	59.8	34.9	35.0	61.5	35.9	22.2
Incr Delay (d2), s/veh	3.6	2.5	1.5	29.9	1.6	0.2	2.3	1.4	1.6	2.3	0.6	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.9	26.5	19.9	2.5	6.4	0.3	2.8	4.8	4.8	1.5	3.7	4.9
LnGrp Delay(d),s/veh	56.5	36.0	27.0	88.9	19.0	5.7	62.1	36.3	36.6	63.8	36.5	23.2
LnGrp LOS	E	D	C	F	B	A	E	D	D	E	D	C
Approach Vol, veh/h		2683			809			487			553	
Approach Delay, s/veh		37.5			27.9			44.7			35.6	
Approach LOS		D			C			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.1	64.6	13.0	42.3	26.8	47.9	10.6	44.7				
Change Period (Y+Rc), s	4.6	5.4	4.6	5.4	4.6	5.4	5.4	* 5.4				
Max Green Setting (Gmax), s	5.5	58.0	13.5	33.0	25.4	38.1	7.2	* 39				
Max Q Clear Time (g_c+I1), s	6.5	54.0	8.4	12.5	21.8	14.7	5.4	11.7				
Green Ext Time (p_c), s	0.0	3.9	0.1	2.3	0.4	21.4	0.1	1.9				
Intersection Summary												
HCM 2010 Ctrl Delay			36.3									
HCM 2010 LOS			D									
Notes												

Timings

9: Waterman Av. & Orange Show Rd./Orange Show Rd.

4/6/2017

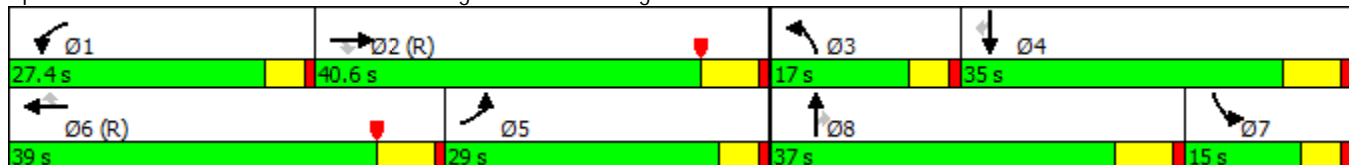


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	211	525	369	141	346	93	112	703	105	101	826	107
Future Volume (vph)	211	525	369	141	346	93	112	703	105	101	826	107
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.2	35.2	9.6	35.2	35.2	9.6	33.2	33.2	9.6	33.2	33.2
Total Split (s)	29.0	40.6	40.6	27.4	39.0	39.0	17.0	37.0	37.0	15.0	35.0	35.0
Total Split (%)	24.2%	33.8%	33.8%	22.8%	32.5%	32.5%	14.2%	30.8%	30.8%	12.5%	29.2%	29.2%
Yellow Time (s)	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Act Effect Green (s)	24.4	41.3	41.3	15.9	32.8	32.8	11.5	30.8	30.8	10.4	29.7	29.7
Actuated g/C Ratio	0.20	0.34	0.34	0.13	0.27	0.27	0.10	0.26	0.26	0.09	0.25	0.25
v/c Ratio	0.71	0.49	0.50	0.73	0.82	0.17	0.80	0.88	0.20	0.80	1.08	0.22
Control Delay	57.0	33.6	7.4	67.9	55.6	0.6	86.0	55.4	1.6	89.1	96.3	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.0	33.6	7.4	67.9	55.6	0.6	86.0	55.4	1.6	89.1	96.3	2.7
LOS	E	C	A	E	E	A	F	E	A	F	F	A
Approach Delay		29.3			49.8			52.9			86.0	
Approach LOS		C			D			D			F	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.08
 Intersection Signal Delay: 54.6
 Intersection LOS: D
 Intersection Capacity Utilization 78.6%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

4/6/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	211	525	369	141	346	93	112	703	105	101	826	107
Future Volume (vph)	211	525	369	141	346	93	112	703	105	101	826	107
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	245	610	429	164	402	108	130	817	122	117	960	124
RTOR Reduction (vph)	0	0	247	0	0	78	0	0	91	0	0	93
Lane Group Flow (vph)	245	610	182	164	402	30	130	817	31	117	960	31
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	24.4	41.3	41.3	15.9	32.8	32.8	11.5	30.8	30.8	10.4	29.7	29.7
Effective Green, g (s)	24.4	41.3	41.3	15.9	32.8	32.8	11.5	30.8	30.8	10.4	29.7	29.7
Actuated g/C Ratio	0.20	0.34	0.34	0.13	0.27	0.27	0.10	0.26	0.26	0.09	0.25	0.25
Clearance Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	345	1239	619	225	492	492	162	924	462	147	891	445
v/s Ratio Prot	c0.14	0.17		0.10	c0.22		0.08	c0.23		0.07	c0.27	
v/s Ratio Perm			0.10			0.02			0.02			0.02
v/c Ratio	0.71	0.49	0.29	0.73	0.82	0.06	0.80	0.88	0.07	0.80	1.08	0.07
Uniform Delay, d1	44.5	31.1	28.7	50.0	40.8	32.2	53.1	42.9	33.7	53.8	45.1	34.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.6	1.4	1.2	9.6	14.0	0.2	23.0	12.1	0.3	23.6	53.2	0.3
Delay (s)	50.1	32.5	29.9	59.6	54.8	32.4	76.1	55.0	34.0	77.3	98.4	34.9
Level of Service	D	C	C	E	D	C	E	D	C	E	F	C
Approach Delay (s)		35.0			52.4			55.1			89.8	
Approach LOS		C			D			E			F	

Intersection Summary

























HCM 2000 Control Delay	58.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

4/6/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	211	525	369	141	346	93	112	703	105	101	826	107
Future Volume (veh/h)	211	525	369	141	346	93	112	703	105	101	826	107
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	245	610	330	164	402	67	130	817	86	117	960	101
Adj No. of Lanes	1	2	1	1	1	1	2	2	1	1	2	1
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	287	1187	531	189	492	418	180	878	393	139	1022	457
Arrive On Green	0.18	0.35	0.35	0.12	0.27	0.27	0.06	0.26	0.26	0.09	0.30	0.30
Sat Flow, veh/h	1619	3420	1530	1619	1800	1530	3141	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	245	610	330	164	402	67	130	817	86	117	960	101
Grp Sat Flow(s),veh/h/ln	1619	1710	1530	1619	1800	1530	1570	1710	1530	1619	1710	1530
Q Serve(g_s), s	17.6	17.0	21.5	11.9	25.1	4.0	4.9	28.0	3.8	8.5	32.8	3.6
Cycle Q Clear(g_c), s	17.6	17.0	21.5	11.9	25.1	4.0	4.9	28.0	3.8	8.5	32.8	3.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	287	1187	531	189	492	418	180	878	393	139	1022	457
V/C Ratio(X)	0.85	0.51	0.62	0.87	0.82	0.16	0.72	0.93	0.22	0.84	0.94	0.22
Avail Cap(c_a), veh/h	329	1187	531	308	492	418	325	878	393	140	1022	457
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.33	0.33	0.33	1.00	1.00	1.00	0.66	0.66	0.66	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.9	31.1	32.6	52.1	40.8	33.1	55.6	43.6	18.3	54.0	41.0	11.4
Incr Delay (d2), s/veh	5.9	0.5	1.8	7.8	14.0	0.8	1.4	12.9	0.8	32.4	16.9	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	8.1	9.4	5.7	14.3	1.8	2.2	14.7	1.7	5.1	17.9	1.6
LnGrp Delay(d),s/veh	53.7	31.7	34.4	59.9	54.8	34.0	57.0	56.4	19.1	86.4	57.9	12.5
LnGrp LOS	D	C	C	E	D	C	E	E	B	F	E	B
Approach Vol, veh/h		1185			633			1033			1178	
Approach Delay, s/veh		37.0			53.9			53.4			56.8	
Approach LOS		D			D			D			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.6	47.9	11.5	42.1	27.5	39.0	16.5	37.0				
Change Period (Y+Rc), s	4.6	6.2	4.6	6.2	6.2	* 6.2	6.2	* 6.2				
Max Green Setting (Gmax), s	22.8	34.4	12.4	28.8	24.4	* 33	10.4	* 31				
Max Q Clear Time (g_c+I1), s	13.9	23.5	6.9	34.8	19.6	27.1	10.5	30.0				
Green Ext Time (p_c), s	0.1	5.1	0.1	0.0	0.6	1.6	0.0	0.4				
Intersection Summary												
HCM 2010 Ctrl Delay			49.7									
HCM 2010 LOS			D									
Notes												

Timings
13: Waterman Av. & I-10 WB On Ramp



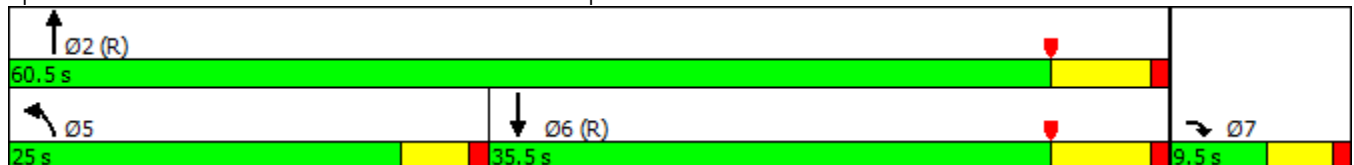
Lane Group	NBL	NBT	SBT	Ø7
Lane Configurations	↵	↑↑	↑↑↑	
Traffic Volume (vph)	363	2515	1471	
Future Volume (vph)	363	2515	1471	
Turn Type	Prot	NA	NA	
Protected Phases	5	2	6	7
Permitted Phases				
Detector Phase	5	2	6	
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	5.0
Minimum Split (s)	14.6	16.2	16.2	9.5
Total Split (s)	25.0	60.5	35.5	9.5
Total Split (%)	35.7%	86.4%	50.7%	14%
Yellow Time (s)	3.6	5.2	5.2	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	
Total Lost Time (s)	4.6	6.2	6.2	
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?	Yes		Yes	
Recall Mode	None	C-Max	C-Max	None
Act Effect Green (s)	18.9	70.0	40.3	
Actuated g/C Ratio	0.27	1.00	0.58	
v/c Ratio	0.78	0.69	0.52	
Control Delay	34.8	1.0	10.2	
Queue Delay	0.0	0.0	0.6	
Total Delay	34.8	1.0	10.8	
LOS	C	A	B	
Approach Delay		5.3	10.8	
Approach LOS		A	B	

Intersection Summary

Cycle Length: 70
 Actuated Cycle Length: 70
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 7.3
 Intersection Capacity Utilization 74.7%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service D

Splits and Phases: 13: Waterman Av. & I-10 WB On Ramp





Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	363	2515	1471	189
Future Volume (vph)	0	0	363	2515	1471	189
Ideal Flow (vphp)	1900	1900	1800	1900	1900	1900
Total Lost time (s)			4.6	6.2	6.2	
Lane Util. Factor			1.00	0.95	0.91	
Frt			1.00	1.00	0.98	
Flt Protected			0.95	1.00	1.00	
Satd. Flow (prot)			1800	3800	5700	
Flt Permitted			0.95	1.00	1.00	
Satd. Flow (perm)			1800	3800	5700	
Peak-hour factor, PHF	0.90	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	378	2620	1532	197
RTOR Reduction (vph)	0	0	0	0	17	0
Lane Group Flow (vph)	0	0	378	2620	1712	0
Turn Type		Prot	Prot	NA	NA	
Protected Phases		7	5	2	6	
Permitted Phases						
Actuated Green, G (s)			18.9	70.0	40.3	
Effective Green, g (s)			18.9	70.0	40.3	
Actuated g/C Ratio			0.27	1.00	0.58	
Clearance Time (s)			4.6	6.2	6.2	
Vehicle Extension (s)			2.0	3.0	3.0	
Lane Grp Cap (vph)			486	3800	3281	
v/s Ratio Prot			0.21	c0.69	0.30	
v/s Ratio Perm						
v/c Ratio			0.78	0.69	0.52	
Uniform Delay, d1			23.6	0.0	9.0	
Progression Factor			1.00	1.00	1.00	
Incremental Delay, d2			7.0	1.0	0.6	
Delay (s)			30.6	1.0	9.6	
Level of Service			C	A	A	
Approach Delay (s)	0.0			4.8	9.6	
Approach LOS	A			A	A	

Intersection Summary

HCM 2000 Control Delay	6.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	0	0	363	2515	1471	189		
Future Volume (veh/h)	0	0	363	2515	1471	189		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	0	1900	1800	1900	1900	1900		
Adj Flow Rate, veh/h	0	0	378	2620	1532	0		
Adj No. of Lanes	0	1	1	2	3	0		
Peak Hour Factor	0.90	0.96	0.96	0.96	0.96	0.96		
Percent Heavy Veh, %	0	0	0	0	0	0		
Cap, veh/h	0	0	420	3290	3116	0		
Arrive On Green	0.00	0.00	0.25	0.91	0.60	0.00		
Sat Flow, veh/h	0		1714	3705	5529	0		
Grp Volume(v), veh/h	0.0		378	2620	1532	0		
Grp Sat Flow(s),veh/h/ln			1714	1805	1729	0		
Q Serve(g_s), s			14.9	16.4	11.7	0.0		
Cycle Q Clear(g_c), s			14.9	16.4	11.7	0.0		
Prop In Lane			1.00			0.00		
Lane Grp Cap(c), veh/h			420	3290	3116	0		
V/C Ratio(X)			0.90	0.80	0.49	0.00		
Avail Cap(c_a), veh/h			500	3290	3116	0		
HCM Platoon Ratio			1.00	1.00	1.00	1.00		
Upstream Filter(I)			1.00	1.00	0.74	0.00		
Uniform Delay (d), s/veh			25.6	1.0	7.9	0.0		
Incr Delay (d2), s/veh			15.7	2.1	0.4	0.0		
Initial Q Delay(d3),s/veh			0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln			8.9	8.2	5.7	0.0		
LnGrp Delay(d),s/veh			41.3	3.1	8.3	0.0		
LnGrp LOS			D	A	A			
Approach Vol, veh/h				2998	1532			
Approach Delay, s/veh				7.9	8.3			
Approach LOS				A	A			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		
Phs Duration (G+Y+Rc), s		70.0			21.8	48.2		
Change Period (Y+Rc), s		6.2			4.6	6.2		
Max Green Setting (Gmax), s		54.3			20.4	29.3		
Max Q Clear Time (g_c+I1), s		18.4			16.9	13.7		
Green Ext Time (p_c), s		34.6			0.2	15.3		
Intersection Summary								
HCM 2010 Ctrl Delay			8.1					
HCM 2010 LOS			A					

Timings
3: E St. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/28/2017

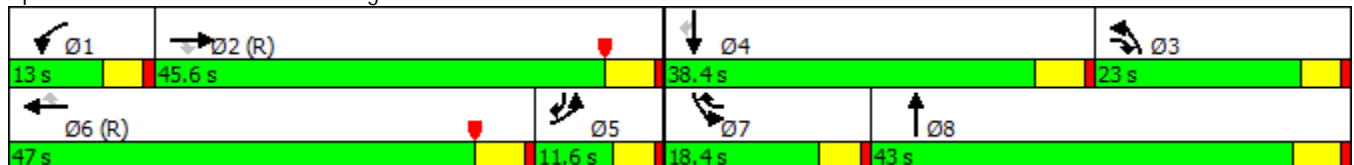


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑	↔	↔↔	↑↑	↔	↔↔	↑↔	↔↔	↑↑	↔
Traffic Volume (vph)	318	1043	434	251	1155	198	402	483	189	389	437
Future Volume (vph)	318	1043	434	251	1155	198	402	483	189	389	437
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	7	4	5
Permitted Phases			2			6					4
Detector Phase	5	2	3	1	6	7	3	8	7	4	5
Switch Phase											
Minimum Initial (s)	5.0	10.0	5.0	5.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0
Minimum Split (s)	9.6	39.4	9.6	9.6	39.4	9.6	9.6	38.4	9.6	38.4	9.6
Total Split (s)	11.6	45.6	23.0	13.0	47.0	18.4	23.0	43.0	18.4	38.4	11.6
Total Split (%)	9.7%	38.0%	19.2%	10.8%	39.2%	15.3%	19.2%	35.8%	15.3%	32.0%	9.7%
Yellow Time (s)	3.6	4.4	3.6	3.6	4.4	3.6	3.6	4.4	3.6	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	4.6	5.4	4.6	4.6	5.4	4.6	5.4	4.6
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max	None	None	Max	None	Max	None
Act Effct Green (s)	7.0	40.2	59.4	8.4	41.6	53.5	18.4	40.3	11.1	33.0	45.4
Actuated g/C Ratio	0.06	0.34	0.50	0.07	0.35	0.45	0.15	0.34	0.09	0.28	0.38
v/c Ratio	1.67	0.85	0.45	1.10	0.91	0.23	1.61	0.52	0.63	0.39	0.58
Control Delay	358.0	45.0	9.8	132.2	26.7	0.7	326.0	32.1	61.2	36.6	25.2
Queue Delay	0.0	4.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	358.0	49.8	9.9	132.2	26.7	0.7	326.0	32.1	61.2	36.6	25.2
LOS	F	D	A	F	C	A	F	C	E	D	C
Approach Delay		94.7			40.0			144.9		36.3	
Approach LOS		F			D			F		D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.67
 Intersection Signal Delay: 77.4
 Intersection LOS: E
 Intersection Capacity Utilization 99.1%
 ICU Level of Service F
 Analysis Period (min) 15

Splits and Phases: 3: E St. & Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
3: E St. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/28/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	318	1043	434	251	1155	198	402	483	163	189	389	437
Future Volume (vph)	318	1043	434	251	1155	198	402	483	163	189	389	437
Ideal Flow (vphp)	1700	1900	1900	1700	1900	1900	1700	1900	1800	1700	1900	1900
Total Lost time (s)	4.6	5.4	4.6	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	0.95	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3400	3800	1900	3400	3800	1900	1700	3800		3400	3800	1900
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3400	3800	1900	3400	3800	1900	1700	3800		3400	3800	1900
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	331	1086	452	261	1203	206	419	503	170	197	405	455
RTOR Reduction (vph)	0	0	62	0	0	67	0	27	0	0	0	75
Lane Group Flow (vph)	331	1086	390	261	1203	139	419	646	0	197	405	380
Confl. Peds. (#/hr)									2			2
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	7.0	40.2	58.6	8.4	41.6	52.7	18.4	40.3		11.1	33.0	40.0
Effective Green, g (s)	7.0	40.2	58.6	8.4	41.6	52.7	18.4	40.3		11.1	33.0	40.0
Actuated g/C Ratio	0.06	0.34	0.49	0.07	0.35	0.44	0.15	0.34		0.09	0.28	0.33
Clearance Time (s)	4.6	5.4	4.6	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6
Vehicle Extension (s)	2.0	4.0	2.0	2.0	4.0	2.0	2.0	3.0		2.0	3.0	2.0
Lane Grp Cap (vph)	198	1273	927	238	1317	834	260	1276		314	1045	706
v/s Ratio Prot	c0.10	0.29	0.06	0.08	c0.32	0.02	c0.25	0.17		0.06	0.11	c0.03
v/s Ratio Perm			0.14			0.06						0.17
v/c Ratio	1.67	0.85	0.42	1.10	0.91	0.17	1.61	0.51		0.63	0.39	0.54
Uniform Delay, d1	56.5	37.2	19.8	55.8	37.5	20.4	50.8	31.9		52.5	35.3	32.5
Progression Factor	1.00	1.00	1.00	1.24	0.52	0.07	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	323.4	7.4	0.1	71.1	6.5	0.0	292.4	1.4		2.8	1.1	0.4
Delay (s)	379.9	44.5	19.9	140.0	25.9	1.4	343.2	33.3		55.3	36.4	32.9
Level of Service	F	D	B	F	C	A	F	C		E	D	C
Approach Delay (s)		98.0			40.7			152.2			38.4	
Approach LOS		F			D			F			D	

Intersection Summary

HCM 2000 Control Delay	80.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	99.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	318	1043	434	251	1155	198	402	483	163	189	389	437
Future Volume (veh/h)	318	1043	434	251	1155	198	402	483	163	189	389	437
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1900	1900	1700	1900	1900	1700	1900	1800	1700	1900	1900
Adj Flow Rate, veh/h	331	1086	276	261	1203	150	419	503	139	197	405	348
Adj No. of Lanes	2	2	1	2	2	1	2	2	0	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	1103	2290	1265	220	1251	688	468	983	270	249	993	1010
Arrive On Green	0.35	0.63	0.63	0.14	0.69	0.69	0.15	0.35	0.35	0.08	0.28	0.28
Sat Flow, veh/h	3141	3610	1615	3141	3610	1615	3141	2799	769	3141	3610	1611
Grp Volume(v), veh/h	331	1086	276	261	1203	150	419	323	319	197	405	348
Grp Sat Flow(s),veh/h/ln	1570	1805	1615	1570	1805	1615	1570	1805	1763	1570	1805	1611
Q Serve(g_s), s	9.2	18.9	2.7	8.4	36.8	2.5	15.7	17.0	17.2	7.4	11.0	0.0
Cycle Q Clear(g_c), s	9.2	18.9	2.7	8.4	36.8	2.5	15.7	17.0	17.2	7.4	11.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.44	1.00		1.00
Lane Grp Cap(c), veh/h	1103	2290	1265	220	1251	688	468	634	619	249	993	1010
V/C Ratio(X)	0.30	0.47	0.22	1.19	0.96	0.22	0.90	0.51	0.51	0.79	0.41	0.34
Avail Cap(c_a), veh/h	1103	2290	1265	220	1251	688	482	634	619	361	993	1010
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.62	0.62	0.62	0.42	0.42	0.42	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.2	11.5	8.3	51.6	17.7	9.3	50.2	30.8	30.8	54.3	35.5	10.7
Incr Delay (d2), s/veh	0.0	0.4	0.2	102.1	9.6	0.3	18.2	2.9	3.0	4.3	1.2	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	9.5	1.2	6.7	19.4	1.2	8.0	9.0	8.8	3.3	5.6	5.7
LnGrp Delay(d),s/veh	28.3	11.9	8.5	153.7	27.3	9.6	68.4	33.7	33.9	58.5	36.8	11.6
LnGrp LOS	C	B	A	F	C	A	E	C	C	E	D	B
Approach Vol, veh/h		1693			1614			1061			950	
Approach Delay, s/veh		14.6			46.1			47.4			32.1	
Approach LOS		B			D			D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.0	82.6	23.3	38.4	48.6	47.0	14.1	47.5				
Change Period (Y+Rc), s	4.6	5.4	5.4	* 5.4	5.4	* 5.4	4.6	5.4				
Max Green Setting (Gmax), s	8.4	40.2	18.4	* 33	7.0	* 42	13.8	37.6				
Max Q Clear Time (g_c+I1), s	10.4	20.9	17.7	13.0	11.2	38.8	9.4	19.2				
Green Ext Time (p_c), s	0.0	11.6	0.1	3.6	0.0	2.3	0.1	4.3				
Intersection Summary												
HCM 2010 Ctrl Delay			33.8									
HCM 2010 LOS			C									
Notes												

Timings

9: Waterman Av. & Orange Show Rd./Orange Show Rd.

4/6/2017

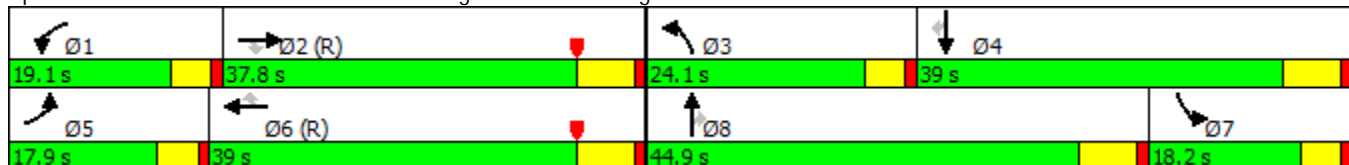


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑	↗	↘↗	↑↑	↗	↘	↑↑	↗
Traffic Volume (vph)	242	849	172	202	611	119	272	1016	187	143	957	155
Future Volume (vph)	242	849	172	202	611	119	272	1016	187	143	957	155
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.2	35.2	9.6	35.2	35.2	9.6	33.2	33.2	9.6	33.2	33.2
Total Split (s)	17.9	37.8	37.8	19.1	39.0	39.0	24.1	44.9	44.9	18.2	39.0	39.0
Total Split (%)	14.9%	31.5%	31.5%	15.9%	32.5%	32.5%	20.1%	37.4%	37.4%	15.2%	32.5%	32.5%
Yellow Time (s)	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Act Effect Green (s)	13.3	31.6	31.6	14.5	32.8	32.8	19.5	38.7	38.7	13.6	32.8	32.8
Actuated g/C Ratio	0.11	0.26	0.26	0.12	0.27	0.27	0.16	0.32	0.32	0.11	0.27	0.27
v/c Ratio	1.36	0.94	0.30	1.04	1.31	0.20	1.04	0.92	0.28	0.79	1.02	0.27
Control Delay	231.6	62.0	7.3	124.8	188.6	2.6	113.0	52.7	7.6	79.4	77.9	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	231.6	62.0	7.3	124.8	188.6	2.6	113.0	52.7	7.6	79.4	77.9	9.2
LOS	F	E	A	F	F	A	F	D	A	E	E	A
Approach Delay		87.1			151.0			58.1			69.6	
Approach LOS		F			F			E			E	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 14.1 (12%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.36
 Intersection Signal Delay: 86.1
 Intersection LOS: F
 Intersection Capacity Utilization 105.4%
 ICU Level of Service G
 Analysis Period (min) 15

Splits and Phases: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

























4/6/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	242	849	172	202	611	119	272	1016	187	143	957	155
Future Volume (vph)	242	849	172	202	611	119	272	1016	187	143	957	155
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	255	894	181	213	643	125	286	1069	197	151	1007	163
RTOR Reduction (vph)	0	0	127	0	0	91	0	0	115	0	0	102
Lane Group Flow (vph)	255	894	54	213	643	34	286	1069	82	151	1007	61
Confl. Peds. (#/hr)			1						1			
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	13.3	31.6	31.6	14.5	32.8	32.8	19.5	38.7	38.7	13.6	32.8	32.8
Effective Green, g (s)	13.3	31.6	31.6	14.5	32.8	32.8	19.5	38.7	38.7	13.6	32.8	32.8
Actuated g/C Ratio	0.11	0.26	0.26	0.12	0.27	0.27	0.16	0.32	0.32	0.11	0.27	0.27
Clearance Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	188	948	474	205	492	492	276	1161	580	192	984	492
v/s Ratio Prot	c0.15	0.25		0.13	c0.36		c0.17	0.30		0.09	c0.28	
v/s Ratio Perm			0.03			0.02			0.05			0.03
v/c Ratio	1.36	0.94	0.11	1.04	1.31	0.07	1.04	0.92	0.14	0.79	1.02	0.12
Uniform Delay, d1	53.4	43.3	33.6	52.8	43.6	32.3	50.2	39.2	28.9	51.8	43.6	32.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	191.0	18.3	0.5	73.5	152.2	0.3	63.9	13.2	0.5	17.5	34.8	0.5
Delay (s)	244.3	61.6	34.1	126.2	195.8	32.6	114.1	52.3	29.4	69.3	78.4	33.3
Level of Service	F	E	C	F	F	C	F	D	C	E	E	C
Approach Delay (s)		92.9			159.9			60.8			71.8	
Approach LOS		F			F			E			E	

Intersection Summary		
HCM 2000 Control Delay	90.6	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.16	F
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	105.4%	21.6
Analysis Period (min)	15	ICU Level of Service
		G

c Critical Lane Group

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	242	849	172	202	611	119	272	1016	187	143	957	155
Future Volume (veh/h)	242	849	172	202	611	119	272	1016	187	143	957	155
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	255	894	128	213	643	90	286	1069	146	151	1007	125
Adj No. of Lanes	1	2	1	1	1	1	2	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	179	1815	802	196	974	827	341	1103	493	175	1147	513
Arrive On Green	0.11	0.53	0.53	0.12	0.54	0.54	0.11	0.32	0.32	0.11	0.34	0.34
Sat Flow, veh/h	1619	3420	1510	1619	1800	1530	3141	3420	1529	1619	3420	1530
Grp Volume(v), veh/h	255	894	128	213	643	90	286	1069	146	151	1007	125
Grp Sat Flow(s),veh/h/ln	1619	1710	1510	1619	1800	1530	1570	1710	1529	1619	1710	1530
Q Serve(g_s), s	13.3	19.9	5.2	14.5	30.6	3.9	10.7	37.0	9.4	11.0	33.3	7.1
Cycle Q Clear(g_c), s	13.3	19.9	5.2	14.5	30.6	3.9	10.7	37.0	9.4	11.0	33.3	7.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	179	1815	802	196	974	827	341	1103	493	175	1147	513
V/C Ratio(X)	1.42	0.49	0.16	1.09	0.66	0.11	0.84	0.97	0.30	0.86	0.88	0.24
Avail Cap(c_a), veh/h	179	1815	802	196	974	827	510	1103	493	183	1147	513
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.19	0.19	0.19	1.00	1.00	1.00	0.09	0.09	0.09	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.3	17.9	14.4	52.8	19.7	17.5	52.5	40.1	36.5	52.6	37.6	28.9
Incr Delay (d2), s/veh	195.9	0.2	0.1	90.0	3.5	0.3	0.5	3.7	0.1	29.5	9.6	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.7	9.4	2.2	11.4	16.1	1.7	4.7	17.9	4.0	6.4	17.2	3.2
LnGrp Delay(d),s/veh	249.2	18.1	14.5	142.8	23.2	17.7	52.9	43.7	36.7	82.2	47.1	30.0
LnGrp LOS	F	B	B	F	C	B	D	D	D	F	D	C
Approach Vol, veh/h		1277			946			1501			1283	
Approach Delay, s/veh		63.9			49.6			44.8			49.6	
Approach LOS		E			D			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.1	70.9	17.6	46.5	17.9	72.1	19.2	44.9				
Change Period (Y+Rc), s	4.6	6.2	4.6	6.2	4.6	6.2	6.2	* 6.2				
Max Green Setting (Gmax), s	14.5	31.6	19.5	32.8	13.3	32.8	13.6	* 39				
Max Q Clear Time (g_c+I1), s	16.5	21.9	12.7	35.3	15.3	32.6	13.0	39.0				
Green Ext Time (p_c), s	0.0	7.6	0.3	0.0	0.0	0.2	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			51.8									
HCM 2010 LOS			D									
Notes												

Timings
13: Waterman Av. & I-10 WB On Ramp

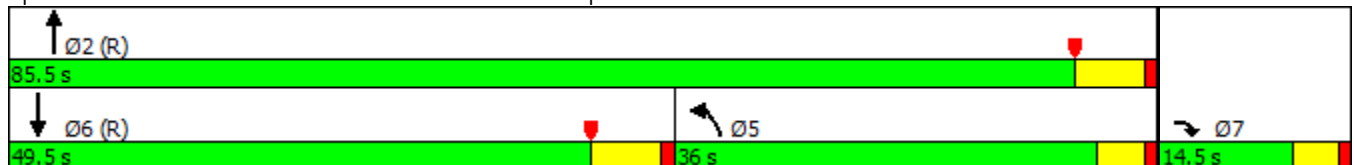


Lane Group	NBL	NBT	SBT	Ø7
Lane Configurations	↶	↑↑	↑↑↑	
Traffic Volume (vph)	661	1970	2053	
Future Volume (vph)	661	1970	2053	
Turn Type	Prot	NA	NA	
Protected Phases	5	2	6	7
Permitted Phases				
Detector Phase	5	2	6	
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	14.5	16.2	16.2	14.5
Total Split (s)	36.0	85.5	49.5	14.5
Total Split (%)	36.0%	85.5%	49.5%	15%
Yellow Time (s)	3.5	5.2	5.2	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	
Total Lost Time (s)	4.5	6.2	6.2	
Lead/Lag	Lag		Lead	
Lead-Lag Optimize?	Yes		Yes	
Recall Mode	None	C-Max	C-Max	None
Act Effct Green (s)	31.5	100.0	57.8	
Actuated g/C Ratio	0.32	1.00	0.58	
v/c Ratio	1.27	0.56	0.95	
Control Delay	164.9	0.6	26.4	
Queue Delay	0.0	0.0	44.8	
Total Delay	164.9	0.6	71.3	
LOS	F	A	E	
Approach Delay		41.9	71.3	
Approach LOS		D	E	

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.27
 Intersection Signal Delay: 57.3
 Intersection LOS: E
 Intersection Capacity Utilization 106.4%
 ICU Level of Service G
 Analysis Period (min) 15

Splits and Phases: 13: Waterman Av. & I-10 WB On Ramp



HCM Signalized Intersection Capacity Analysis
 13: Waterman Av. & I-10 WB On Ramp

Gateway South Building 4 TIA (JN 10187)

3/28/2017



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↖	↑↑	↑↑↗	
Traffic Volume (vph)	0	0	661	1970	2053	859
Future Volume (vph)	0	0	661	1970	2053	859
Ideal Flow (vphp)	1900	1900	1800	1900	1900	1900
Total Lost time (s)			4.5	6.2	6.2	
Lane Util. Factor			1.00	0.95	0.91	
Frt			1.00	1.00	0.96	
Flt Protected			0.95	1.00	1.00	
Satd. Flow (prot)			1800	3800	5700	
Flt Permitted			0.95	1.00	1.00	
Satd. Flow (perm)			1800	3800	5700	
Peak-hour factor, PHF	0.90	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	718	2141	2232	934
RTOR Reduction (vph)	0	0	0	0	56	0
Lane Group Flow (vph)	0	0	718	2141	3110	0
Turn Type		Prot	Prot	NA	NA	
Protected Phases		7	5	2	6	
Permitted Phases						
Actuated Green, G (s)			31.5	100.0	57.8	
Effective Green, g (s)			31.5	100.0	57.8	
Actuated g/C Ratio			0.32	1.00	0.58	
Clearance Time (s)			4.5	6.2	6.2	
Vehicle Extension (s)			2.0	3.0	3.0	
Lane Grp Cap (vph)			567	3800	3294	
v/s Ratio Prot			c0.40	0.56	c0.55	
v/s Ratio Perm						
v/c Ratio			1.27	0.56	0.94	
Uniform Delay, d1			34.2	0.0	19.6	
Progression Factor			1.00	1.00	1.00	
Incremental Delay, d2			133.4	0.6	7.2	
Delay (s)			167.7	0.6	26.8	
Level of Service			F	A	C	
Approach Delay (s)	0.0			42.6	26.8	
Approach LOS	A			D	C	

Intersection Summary

HCM 2000 Control Delay	34.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.2
Intersection Capacity Utilization	106.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	0	0	661	1970	2053	859		
Future Volume (veh/h)	0	0	661	1970	2053	859		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	0	1900	1800	1900	1900	1900		
Adj Flow Rate, veh/h	0	0	718	2141	2232	0		
Adj No. of Lanes	0	1	1	2	3	0		
Peak Hour Factor	0.90	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	0	0	0	0	0	0		
Cap, veh/h	0	0	759	3386	2246	0		
Arrive On Green	0.00	0.00	0.44	0.94	0.43	0.00		
Sat Flow, veh/h	0		1714	3705	5529	0		
Grp Volume(v), veh/h	0.0		718	2141	2232	0		
Grp Sat Flow(s),veh/h/ln			1714	1805	1729	0		
Q Serve(g_s), s			40.1	9.0	42.8	0.0		
Cycle Q Clear(g_c), s			40.1	9.0	42.8	0.0		
Prop In Lane			1.00			0.00		
Lane Grp Cap(c), veh/h			759	3386	2246	0		
V/C Ratio(X)			0.95	0.63	0.99	0.00		
Avail Cap(c_a), veh/h			759	3386	2246	0		
HCM Platoon Ratio			1.00	1.00	1.00	1.00		
Upstream Filter(I)			1.00	1.00	0.36	0.00		
Uniform Delay (d), s/veh			26.7	0.5	28.2	0.0		
Incr Delay (d2), s/veh			20.3	0.9	10.1	0.0		
Initial Q Delay(d3),s/veh			0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln			23.2	4.3	22.3	0.0		
LnGrp Delay(d),s/veh			46.9	1.4	38.3	0.0		
LnGrp LOS			D	A	D			
Approach Vol, veh/h				2859	2232			
Approach Delay, s/veh				12.8	38.3			
Approach LOS				B	D			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		
Phs Duration (G+Y+Rc), s		100.0			50.5	49.5		
Change Period (Y+Rc), s		6.2			6.2	* 6.2		
Max Green Setting (Gmax), s		79.3			31.5	* 43		
Max Q Clear Time (g_c+I1), s		11.0			42.1	44.8		
Green Ext Time (p_c), s		36.9			0.0	0.0		
Intersection Summary								
HCM 2010 Ctrl Delay			24.0					
HCM 2010 LOS			C					
Notes								

APPENDIX 8.10:

**HORIZON YEAR (2040) WITH PROJECT CONDITIONS INTERSECTION OPERATIONS
ANALYSIS WORKSHEETS WITH IMPROVEMENTS**

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Timings
3: E St. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/28/2017

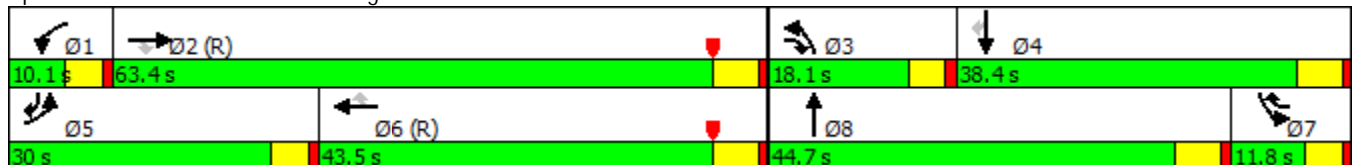


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑	↗	↔↔	↑↑	↗	↔↔	↑↑	↔↔	↑↑	↗
Traffic Volume (vph)	429	1399	808	99	597	69	137	201	76	230	202
Future Volume (vph)	429	1399	808	99	597	69	137	201	76	230	202
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	7	4	5
Permitted Phases			2			6					4
Detector Phase	5	2	3	1	6	7	3	8	7	4	5
Switch Phase											
Minimum Initial (s)	5.0	10.0	5.0	5.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0
Minimum Split (s)	9.6	39.4	9.6	9.6	39.4	9.6	9.6	38.4	9.6	38.4	9.6
Total Split (s)	30.0	63.4	18.1	10.1	43.5	11.8	18.1	44.7	11.8	38.4	30.0
Total Split (%)	23.1%	48.8%	13.9%	7.8%	33.5%	9.1%	13.9%	34.4%	9.1%	29.5%	23.1%
Yellow Time (s)	3.6	4.4	3.6	3.6	4.4	3.6	3.6	4.4	3.6	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	4.6	5.4	4.6	4.6	5.4	4.6	5.4	4.6
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max	None	None	Max	None	Max	None
Act Effct Green (s)	22.3	58.0	76.6	5.5	41.2	49.2	13.2	39.3	7.2	33.3	60.9
Actuated g/C Ratio	0.17	0.45	0.59	0.04	0.32	0.38	0.10	0.30	0.06	0.26	0.47
v/c Ratio	0.84	0.94	0.75	0.79	0.56	0.10	0.91	0.30	0.46	0.27	0.25
Control Delay	65.5	46.0	18.5	92.7	56.6	8.1	104.9	26.0	67.7	39.6	14.0
Queue Delay	0.0	45.0	13.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.5	91.0	32.5	92.7	56.6	8.1	104.9	26.0	67.7	39.6	14.0
LOS	E	F	C	F	E	A	F	C	E	D	B
Approach Delay		68.9			56.9			49.6		33.6	
Approach LOS		E			E			D		C	

Intersection Summary

Cycle Length: 130
 Actuated Cycle Length: 130
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 120
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.94
 Intersection Signal Delay: 60.7
 Intersection LOS: E
 Intersection Capacity Utilization 91.2%
 ICU Level of Service F
 Analysis Period (min) 15
































Splits and Phases: 3: E St. & Orange Show Rd.


























HCM Signalized Intersection Capacity Analysis
3: E St. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/28/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 		 	 		 	 	
Traffic Volume (vph)	429	1399	808	99	597	69	137	201	120	76	230	202
Future Volume (vph)	429	1399	808	99	597	69	137	201	120	76	230	202
Ideal Flow (vphp)	1700	1900	1900	1700	1900	1900	1700	1900	1800	1700	1900	1900
Total Lost time (s)	4.6	5.4	4.6	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	0.95	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3400	3800	1900	3400	3800	1900	1700	3800		3400	3800	1900
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3400	3800	1900	3400	3800	1900	1700	3800		3400	3800	1900
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	488	1590	918	112	678	78	156	228	136	86	261	230
RTOR Reduction (vph)	0	0	110	0	0	49	0	67	0	0	0	43
Lane Group Flow (vph)	488	1590	808	113	678	29	156	297	0	86	261	187
Confl. Peds. (#/hr)									2			
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	22.3	58.0	71.2	5.5	41.2	48.4	13.2	39.3		7.2	33.3	55.6
Effective Green, g (s)	22.3	58.0	71.2	5.5	41.2	48.4	13.2	39.3		7.2	33.3	55.6
Actuated g/C Ratio	0.17	0.45	0.55	0.04	0.32	0.37	0.10	0.30		0.06	0.26	0.43
Clearance Time (s)	4.6	5.4	4.6	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6
Vehicle Extension (s)	2.0	4.0	2.0	2.0	4.0	2.0	2.0	3.0		2.0	3.0	2.0
Lane Grp Cap (vph)	583	1695	1040	143	1204	707	172	1148		188	973	812
v/s Ratio Prot	c0.14	c0.42	0.08	0.03	0.18	0.00	c0.09	0.08		c0.03	c0.07	0.04
v/s Ratio Perm			0.35			0.01						0.06
v/c Ratio	0.84	0.94	0.78	0.79	0.56	0.04	0.91	0.26		0.46	0.27	0.23
Uniform Delay, d1	52.1	34.3	23.1	61.7	36.9	26.0	57.8	34.3		59.5	38.6	23.6
Progression Factor	1.00	1.00	1.00	0.98	1.45	109.71	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	9.7	11.4	3.4	21.7	1.7	0.0	41.8	0.5		0.6	0.7	0.1
Delay (s)	61.8	45.7	26.5	82.3	55.4	2853.2	99.6	34.9		60.2	39.3	23.7
Level of Service	E	D	C	F	E	F	F	C		E	D	C
Approach Delay (s)		42.4			310.0			54.3			36.2	
Approach LOS		D			F			D			D	
Intersection Summary												
HCM 2000 Control Delay			89.8									F
HCM 2000 Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			130.0						20.0			
Intersection Capacity Utilization			91.2%									F
ICU Level of Service												
Analysis Period (min)			15									
c Critical Lane Group												

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	429	1399	808	99	597	69	137	201	120	76	230	202
Future Volume (veh/h)	429	1399	808	99	597	69	137	201	120	76	230	202
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1900	1900	1700	1900	1900	1700	1900	1800	1700	1900	1900
Adj Flow Rate, veh/h	488	1590	667	112	678	47	156	228	104	86	261	208
Adj No. of Lanes	2	2	1	2	2	1	2	2	0	2	2	1
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	537	1641	839	133	1176	592	204	737	325	128	1027	736
Arrive On Green	0.17	0.45	0.45	0.08	0.65	0.65	0.06	0.30	0.30	0.04	0.28	0.28
Sat Flow, veh/h	3141	3610	1615	3141	3610	1615	3141	2437	1076	3141	3610	1615
Grp Volume(v), veh/h	488	1590	667	112	678	47	156	167	165	86	261	208
Grp Sat Flow(s),veh/h/ln	1570	1805	1615	1570	1805	1615	1570	1805	1708	1570	1805	1615
Q Serve(g_s), s	19.8	55.8	44.0	4.6	13.6	0.4	6.4	9.2	9.7	3.5	7.2	10.5
Cycle Q Clear(g_c), s	19.8	55.8	44.0	4.6	13.6	0.4	6.4	9.2	9.7	3.5	7.2	10.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.63	1.00		1.00
Lane Grp Cap(c), veh/h	537	1641	839	133	1176	592	204	546	516	128	1027	736
V/C Ratio(X)	0.91	0.97	0.80	0.84	0.58	0.08	0.77	0.31	0.32	0.67	0.25	0.28
Avail Cap(c_a), veh/h	614	1641	839	133	1176	592	326	546	516	174	1027	736
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.19	0.19	0.19	0.87	0.87	0.87	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.9	34.6	25.6	59.1	17.6	5.5	59.8	34.9	35.0	61.5	35.9	22.1
Incr Delay (d2), s/veh	3.6	4.8	1.5	31.3	1.8	0.2	2.3	1.4	1.6	2.3	0.6	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.9	28.9	19.9	2.5	6.9	0.3	2.8	4.8	4.8	1.6	3.7	4.9
LnGrp Delay(d),s/veh	56.5	39.4	27.1	90.4	19.4	5.7	62.1	36.3	36.7	63.7	36.5	23.1
LnGrp LOS	E	D	C	F	B	A	E	D	D	E	D	C
Approach Vol, veh/h		2745			837			488			555	
Approach Delay, s/veh		39.4			28.2			44.7			35.7	
Approach LOS		D			C			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.1	64.5	13.0	42.4	26.8	47.8	10.7	44.7				
Change Period (Y+Rc), s	4.6	5.4	4.6	5.4	4.6	5.4	5.4	* 5.4				
Max Green Setting (Gmax), s	5.5	58.0	13.5	33.0	25.4	38.1	7.2	* 39				
Max Q Clear Time (g_c+I1), s	6.6	57.8	8.4	12.5	21.8	15.6	5.5	11.7				
Green Ext Time (p_c), s	0.0	0.2	0.1	2.3	0.4	20.9	0.1	1.9				
Intersection Summary												
HCM 2010 Ctrl Delay			37.5									
HCM 2010 LOS			D									
Notes												

Timings

9: Waterman Av. & Orange Show Rd./Orange Show Rd.

4/6/2017

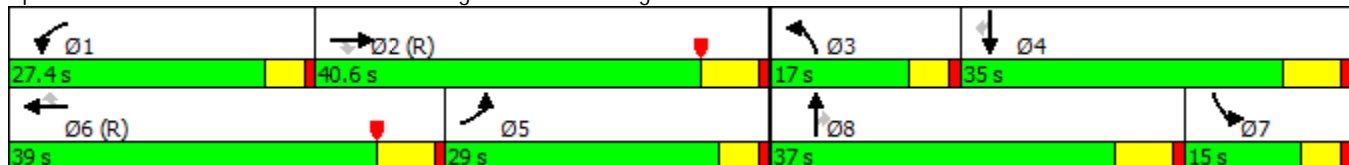


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (vph)	211	525	403	150	346	93	127	704	109	101	828	107
Future Volume (vph)	211	525	403	150	346	93	127	704	109	101	828	107
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.2	35.2	9.6	35.2	35.2	9.6	33.2	33.2	9.6	33.2	33.2
Total Split (s)	29.0	40.6	40.6	27.4	39.0	39.0	17.0	37.0	37.0	15.0	35.0	35.0
Total Split (%)	24.2%	33.8%	33.8%	22.8%	32.5%	32.5%	14.2%	30.8%	30.8%	12.5%	29.2%	29.2%
Yellow Time (s)	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Act Effect Green (s)	24.4	40.7	40.7	16.5	32.8	32.8	12.0	30.8	30.8	10.4	29.2	29.2
Actuated g/C Ratio	0.20	0.34	0.34	0.14	0.27	0.27	0.10	0.26	0.26	0.09	0.24	0.24
v/c Ratio	0.71	0.50	0.55	0.74	0.82	0.17	0.88	0.89	0.21	0.80	1.10	0.22
Control Delay	57.0	34.2	10.4	68.0	55.6	0.6	95.8	55.6	2.0	89.1	103.9	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.0	34.2	10.4	68.0	55.6	0.6	95.8	55.6	2.0	89.1	103.9	2.8
LOS	E	C	B	E	E	A	F	E	A	F	F	A
Approach Delay		30.0			50.0			54.8			92.0	
Approach LOS		C			D			D			F	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.10
 Intersection Signal Delay: 56.8
 Intersection LOS: E
 Intersection Capacity Utilization 78.6%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

4/6/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	211	525	403	150	346	93	127	704	109	101	828	107
Future Volume (vph)	211	525	403	150	346	93	127	704	109	101	828	107
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	245	610	469	174	402	108	148	819	127	117	963	124
RTOR Reduction (vph)	0	0	243	0	0	78	0	0	94	0	0	94
Lane Group Flow (vph)	245	610	226	174	402	30	148	819	33	117	963	30
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7		4
Permitted Phases			2			6			8			4
Actuated Green, G (s)	24.4	40.7	40.7	16.5	32.8	32.8	12.0	30.8	30.8	10.4	29.2	29.2
Effective Green, g (s)	24.4	40.7	40.7	16.5	32.8	32.8	12.0	30.8	30.8	10.4	29.2	29.2
Actuated g/C Ratio	0.20	0.34	0.34	0.14	0.27	0.27	0.10	0.26	0.26	0.09	0.24	0.24
Clearance Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	345	1221	610	233	492	492	170	924	462	147	876	438
v/s Ratio Prot	c0.14	0.17		0.10	c0.22		0.09	c0.23		0.07	c0.27	
v/s Ratio Perm			0.13			0.02			0.02			0.02
v/c Ratio	0.71	0.50	0.37	0.75	0.82	0.06	0.87	0.89	0.07	0.80	1.10	0.07
Uniform Delay, d1	44.5	31.5	30.0	49.7	40.8	32.2	53.2	42.9	33.8	53.8	45.4	34.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.6	1.5	1.7	10.8	14.0	0.2	34.3	12.3	0.3	23.6	61.3	0.3
Delay (s)	50.1	33.0	31.7	60.6	54.8	32.4	87.6	55.2	34.1	77.3	106.7	35.2
Level of Service	D	C	C	E	D	C	F	E	C	E	F	D
Approach Delay (s)		35.7			52.7			57.1			96.5	
Approach LOS		D			D			E			F	

Intersection Summary

























HCM 2000 Control Delay	60.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

4/6/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	211	525	403	150	346	93	127	704	109	101	828	107
Future Volume (veh/h)	211	525	403	150	346	93	127	704	109	101	828	107
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	245	610	370	174	402	67	148	819	91	117	963	101
Adj No. of Lanes	1	2	1	1	1	1	2	2	1	1	2	1
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	287	1166	522	199	492	418	199	878	393	139	1001	448
Arrive On Green	0.18	0.34	0.34	0.12	0.27	0.27	0.06	0.26	0.26	0.09	0.29	0.29
Sat Flow, veh/h	1619	3420	1530	1619	1800	1530	3141	3420	1530	1619	3420	1530
Grp Volume(v), veh/h	245	610	370	174	402	67	148	819	91	117	963	101
Grp Sat Flow(s),veh/h/ln	1619	1710	1530	1619	1800	1530	1570	1710	1530	1619	1710	1530
Q Serve(g_s), s	17.6	17.2	25.2	12.7	25.1	4.0	5.6	28.1	4.0	8.5	33.3	3.6
Cycle Q Clear(g_c), s	17.6	17.2	25.2	12.7	25.1	4.0	5.6	28.1	4.0	8.5	33.3	3.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	287	1166	522	199	492	418	199	878	393	139	1001	448
V/C Ratio(X)	0.85	0.52	0.71	0.87	0.82	0.16	0.74	0.93	0.23	0.84	0.96	0.23
Avail Cap(c_a), veh/h	329	1166	522	308	492	418	325	878	393	140	1001	448
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.09	1.00	1.00	1.00	0.94	0.94	0.94	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.9	31.7	34.4	51.7	40.8	33.1	55.2	43.6	17.9	54.0	41.8	11.7
Incr Delay (d2), s/veh	1.7	0.2	0.8	10.6	14.0	0.8	1.9	17.1	1.3	32.4	20.6	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.0	8.2	10.7	6.2	14.3	1.8	2.5	15.3	1.8	5.1	18.5	1.7
LnGrp Delay(d),s/veh	49.6	31.9	35.1	62.3	54.8	34.0	57.2	60.6	19.2	86.4	62.4	12.9
LnGrp LOS	D	C	D	E	D	C	E	E	B	F	E	B
Approach Vol, veh/h		1225			643			1058			1181	
Approach Delay, s/veh		36.4			54.6			56.6			60.5	
Approach LOS		D			D			E			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.4	47.1	12.2	41.3	27.5	39.0	16.5	37.0				
Change Period (Y+Rc), s	4.6	6.2	4.6	6.2	6.2	* 6.2	6.2	* 6.2				
Max Green Setting (Gmax), s	22.8	34.4	12.4	28.8	24.4	* 33	10.4	* 31				
Max Q Clear Time (g_c+I1), s	14.7	27.2	7.6	35.3	19.6	27.1	10.5	30.1				
Green Ext Time (p_c), s	0.1	3.9	0.1	0.0	0.6	1.6	0.0	0.4				
Intersection Summary												
HCM 2010 Ctrl Delay			51.4									
HCM 2010 LOS			D									
Notes												

Timings
13: Waterman Av. & I-10 WB On Ramp



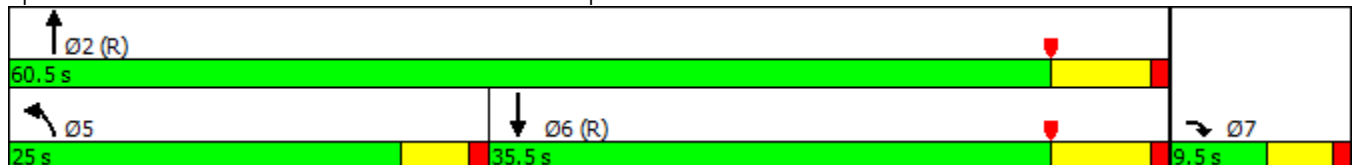
Lane Group	NBL	NBT	SBT	Ø7
Lane Configurations	↵	↑↑	↑↑↑	
Traffic Volume (vph)	363	2542	1481	
Future Volume (vph)	363	2542	1481	
Turn Type	Prot	NA	NA	
Protected Phases	5	2	6	7
Permitted Phases				
Detector Phase	5	2	6	
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	5.0
Minimum Split (s)	14.6	16.2	16.2	9.5
Total Split (s)	25.0	60.5	35.5	9.5
Total Split (%)	35.7%	86.4%	50.7%	14%
Yellow Time (s)	3.6	5.2	5.2	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	
Total Lost Time (s)	4.6	6.2	6.2	
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?	Yes		Yes	
Recall Mode	None	C-Max	C-Max	None
Act Effect Green (s)	18.9	70.0	40.3	
Actuated g/C Ratio	0.27	1.00	0.58	
v/c Ratio	0.78	0.70	0.53	
Control Delay	34.8	1.1	10.2	
Queue Delay	0.0	0.0	0.7	
Total Delay	34.8	1.1	10.9	
LOS	C	A	B	
Approach Delay		5.3	10.9	
Approach LOS		A	B	

Intersection Summary

Cycle Length: 70
 Actuated Cycle Length: 70
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 7.3
 Intersection Capacity Utilization 75.4%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service D

Splits and Phases: 13: Waterman Av. & I-10 WB On Ramp



HCM Signalized Intersection Capacity Analysis
 13: Waterman Av. & I-10 WB On Ramp



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↘	↑↑	↑↑↔	
Traffic Volume (vph)	0	0	363	2542	1481	195
Future Volume (vph)	0	0	363	2542	1481	195
Ideal Flow (vphp)	1900	1900	1800	1900	1900	1900
Total Lost time (s)			4.6	6.2	6.2	
Lane Util. Factor			1.00	0.95	0.91	
Frt			1.00	1.00	0.98	
Flt Protected			0.95	1.00	1.00	
Satd. Flow (prot)			1800	3800	5700	
Flt Permitted			0.95	1.00	1.00	
Satd. Flow (perm)			1800	3800	5700	
Peak-hour factor, PHF	0.90	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	378	2648	1543	203
RTOR Reduction (vph)	0	0	0	0	17	0
Lane Group Flow (vph)	0	0	378	2648	1729	0
Turn Type		Prot	Prot	NA	NA	
Protected Phases		7	5	2	6	
Permitted Phases						
Actuated Green, G (s)			18.9	70.0	40.3	
Effective Green, g (s)			18.9	70.0	40.3	
Actuated g/C Ratio			0.27	1.00	0.58	
Clearance Time (s)			4.6	6.2	6.2	
Vehicle Extension (s)			2.0	3.0	3.0	
Lane Grp Cap (vph)			486	3800	3281	
v/s Ratio Prot			0.21	c0.70	0.30	
v/s Ratio Perm						
v/c Ratio			0.78	0.70	0.53	
Uniform Delay, d1			23.6	0.0	9.0	
Progression Factor			1.00	1.00	1.00	
Incremental Delay, d2			7.0	1.1	0.6	
Delay (s)			30.6	1.1	9.7	
Level of Service			C	A	A	
Approach Delay (s)	0.0			4.8	9.7	
Approach LOS	A			A	A	

Intersection Summary

HCM 2000 Control Delay	6.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	75.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations		↗	↖	↑↑	↑↑↔			
Traffic Volume (veh/h)	0	0	363	2542	1481	195		
Future Volume (veh/h)	0	0	363	2542	1481	195		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	0	1900	1800	1900	1900	1900		
Adj Flow Rate, veh/h	0	0	378	2648	1543	0		
Adj No. of Lanes	0	1	1	2	3	0		
Peak Hour Factor	0.90	0.96	0.96	0.96	0.96	0.96		
Percent Heavy Veh, %	0	0	0	0	0	0		
Cap, veh/h	0	0	420	3290	3116	0		
Arrive On Green	0.00	0.00	0.25	0.91	0.60	0.00		
Sat Flow, veh/h	0		1714	3705	5529	0		
Grp Volume(v), veh/h	0.0		378	2648	1543	0		
Grp Sat Flow(s),veh/h/ln			1714	1805	1729	0		
Q Serve(g_s), s			14.9	17.1	11.8	0.0		
Cycle Q Clear(g_c), s			14.9	17.1	11.8	0.0		
Prop In Lane			1.00			0.00		
Lane Grp Cap(c), veh/h			420	3290	3116	0		
V/C Ratio(X)			0.90	0.80	0.50	0.00		
Avail Cap(c_a), veh/h			500	3290	3116	0		
HCM Platoon Ratio			1.00	1.00	1.00	1.00		
Upstream Filter(I)			1.00	1.00	0.74	0.00		
Uniform Delay (d), s/veh			25.6	1.0	7.9	0.0		
Incr Delay (d2), s/veh			15.7	2.2	0.4	0.0		
Initial Q Delay(d3),s/veh			0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln			8.9	8.4	5.7	0.0		
LnGrp Delay(d),s/veh			41.3	3.2	8.4	0.0		
LnGrp LOS			D	A	A			
Approach Vol, veh/h				3026	1543			
Approach Delay, s/veh				8.0	8.4			
Approach LOS				A	A			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		
Phs Duration (G+Y+Rc), s		70.0			21.8	48.2		
Change Period (Y+Rc), s		6.2			4.6	6.2		
Max Green Setting (Gmax), s		54.3			20.4	29.3		
Max Q Clear Time (g_c+I1), s		19.1			16.9	13.8		
Green Ext Time (p_c), s		34.1			0.2	15.2		
Intersection Summary								
HCM 2010 Ctrl Delay			8.1					
HCM 2010 LOS			A					

Timings
3: E St. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/28/2017

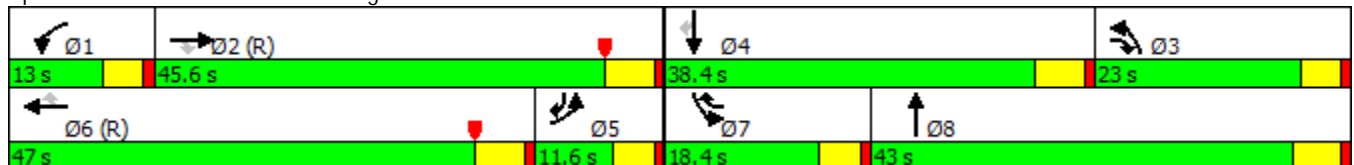


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑	↗	↔↔	↑↑	↗	↔↔	↑↑	↔↔	↑↑	↗
Traffic Volume (vph)	318	1071	434	252	1217	200	402	483	190	389	437
Future Volume (vph)	318	1071	434	252	1217	200	402	483	190	389	437
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	7	4	5
Permitted Phases			2			6					4
Detector Phase	5	2	3	1	6	7	3	8	7	4	5
Switch Phase											
Minimum Initial (s)	5.0	10.0	5.0	5.0	10.0	5.0	5.0	10.0	5.0	10.0	5.0
Minimum Split (s)	9.6	39.4	9.6	9.6	39.4	9.6	9.6	38.4	9.6	38.4	9.6
Total Split (s)	11.6	45.6	23.0	13.0	47.0	18.4	23.0	43.0	18.4	38.4	11.6
Total Split (%)	9.7%	38.0%	19.2%	10.8%	39.2%	15.3%	19.2%	35.8%	15.3%	32.0%	9.7%
Yellow Time (s)	3.6	4.4	3.6	3.6	4.4	3.6	3.6	4.4	3.6	4.4	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.4	4.6	4.6	5.4	4.6	4.6	5.4	4.6	5.4	4.6
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max	None	None	Max	None	Max	None
Act Effect Green (s)	7.0	40.2	59.4	8.4	41.6	53.5	18.4	40.3	11.1	33.0	45.4
Actuated g/C Ratio	0.06	0.34	0.50	0.07	0.35	0.45	0.15	0.34	0.09	0.28	0.38
v/c Ratio	1.67	0.88	0.45	1.11	0.96	0.23	1.61	0.52	0.63	0.39	0.58
Control Delay	358.0	46.7	9.8	136.0	34.0	0.7	326.0	32.0	61.3	36.6	25.2
Queue Delay	0.0	7.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	358.0	54.3	9.9	136.0	34.0	0.7	326.0	32.0	61.3	36.6	25.2
LOS	F	D	A	F	C	A	F	C	E	D	C
Approach Delay		96.7			45.5			144.7		36.3	
Approach LOS		F			D			F		D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 150
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.67
 Intersection Signal Delay: 79.3
 Intersection LOS: E
 Intersection Capacity Utilization 100.8%
 ICU Level of Service G
 Analysis Period (min) 15
























Splits and Phases: 3: E St. & Orange Show Rd.



























HCM Signalized Intersection Capacity Analysis
3: E St. & Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

3/28/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	318	1071	434	252	1217	200	402	483	164	190	389	437
Future Volume (vph)	318	1071	434	252	1217	200	402	483	164	190	389	437
Ideal Flow (vphp)	1700	1900	1900	1700	1900	1900	1700	1900	1800	1700	1900	1900
Total Lost time (s)	4.6	5.4	4.6	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	0.95	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3400	3800	1900	3400	3800	1900	1700	3800		3400	3800	1900
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3400	3800	1900	3400	3800	1900	1700	3800		3400	3800	1900
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	331	1116	452	262	1268	208	419	503	171	198	405	455
RTOR Reduction (vph)	0	0	61	0	0	67	0	27	0	0	0	75
Lane Group Flow (vph)	331	1116	391	263	1268	141	419	647	0	198	405	380
Confl. Peds. (#/hr)									2			2
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	7.0	40.2	58.6	8.4	41.6	52.7	18.4	40.3		11.1	33.0	40.0
Effective Green, g (s)	7.0	40.2	58.6	8.4	41.6	52.7	18.4	40.3		11.1	33.0	40.0
Actuated g/C Ratio	0.06	0.34	0.49	0.07	0.35	0.44	0.15	0.34		0.09	0.28	0.33
Clearance Time (s)	4.6	5.4	4.6	4.6	5.4	4.6	4.6	5.4		4.6	5.4	4.6
Vehicle Extension (s)	2.0	4.0	2.0	2.0	4.0	2.0	2.0	3.0		2.0	3.0	2.0
Lane Grp Cap (vph)	198	1273	927	238	1317	834	260	1276		314	1045	706
v/s Ratio Prot	c0.10	0.29	0.06	0.08	c0.33	0.02	c0.25	0.17		0.06	0.11	c0.03
v/s Ratio Perm			0.14			0.06						0.17
v/c Ratio	1.67	0.88	0.42	1.11	0.96	0.17	1.61	0.51		0.63	0.39	0.54
Uniform Delay, d1	56.5	37.6	19.8	55.8	38.4	20.4	50.8	31.9		52.5	35.3	32.5
Progression Factor	1.00	1.00	1.00	1.23	0.54	0.07	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	323.4	8.7	0.1	75.8	11.9	0.0	292.4	1.4		3.0	1.1	0.4
Delay (s)	379.9	46.3	19.9	144.2	32.7	1.5	343.2	33.3		55.5	36.4	32.9
Level of Service	F	D	B	F	C	A	F	C		E	D	C
Approach Delay (s)		98.1			45.8			152.1			38.5	
Approach LOS		F			D			F			D	
Intersection Summary												
HCM 2000 Control Delay			81.7									F
HCM 2000 Volume to Capacity ratio			1.00									
Actuated Cycle Length (s)			120.0						20.0			
Intersection Capacity Utilization			100.8%									G
Analysis Period (min)			15									
c Critical Lane Group												

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	318	1071	434	252	1217	200	402	483	164	190	389	437
Future Volume (veh/h)	318	1071	434	252	1217	200	402	483	164	190	389	437
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1900	1900	1700	1900	1900	1700	1900	1800	1700	1900	1900
Adj Flow Rate, veh/h	331	1116	276	262	1268	152	419	503	140	198	405	348
Adj No. of Lanes	2	2	1	2	2	1	2	2	0	2	2	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	1103	2290	1265	220	1251	688	468	980	271	250	993	1010
Arrive On Green	0.35	0.63	0.63	0.14	0.69	0.69	0.15	0.35	0.35	0.08	0.28	0.28
Sat Flow, veh/h	3141	3610	1615	3141	3610	1615	3141	2794	773	3141	3610	1611
Grp Volume(v), veh/h	331	1116	276	262	1268	152	419	324	319	198	405	348
Grp Sat Flow(s),veh/h/ln	1570	1805	1615	1570	1805	1615	1570	1805	1762	1570	1805	1611
Q Serve(g_s), s	9.2	19.6	2.7	8.4	41.6	2.6	15.7	17.0	17.2	7.4	11.0	0.0
Cycle Q Clear(g_c), s	9.2	19.6	2.7	8.4	41.6	2.6	15.7	17.0	17.2	7.4	11.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.44	1.00		1.00
Lane Grp Cap(c), veh/h	1103	2290	1265	220	1251	688	468	633	618	250	993	1010
V/C Ratio(X)	0.30	0.49	0.22	1.19	1.01	0.22	0.90	0.51	0.52	0.79	0.41	0.34
Avail Cap(c_a), veh/h	1103	2290	1265	220	1251	688	482	633	618	361	993	1010
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.62	0.62	0.62	0.42	0.42	0.42	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.2	11.6	8.3	51.6	18.4	9.3	50.2	30.8	30.9	54.2	35.5	10.7
Incr Delay (d2), s/veh	0.0	0.5	0.2	103.9	19.8	0.3	18.2	2.9	3.1	4.4	1.2	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	9.9	1.2	6.8	23.3	1.2	8.0	9.0	8.9	3.4	5.6	5.7
LnGrp Delay(d),s/veh	28.3	12.1	8.5	155.5	38.2	9.6	68.4	33.7	33.9	58.7	36.8	11.6
LnGrp LOS	C	B	A	F	F	A	E	C	C	E	D	B
Approach Vol, veh/h		1723			1682			1062			951	
Approach Delay, s/veh		14.6			53.9			47.5			32.1	
Approach LOS		B			D			D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.0	82.6	23.3	38.4	48.6	47.0	14.2	47.5				
Change Period (Y+Rc), s	4.6	5.4	5.4	* 5.4	5.4	* 5.4	4.6	5.4				
Max Green Setting (Gmax), s	8.4	40.2	18.4	* 33	7.0	* 42	13.8	37.6				
Max Q Clear Time (g_c+I1), s	10.4	21.6	17.7	13.0	11.2	43.6	9.4	19.2				
Green Ext Time (p_c), s	0.0	11.6	0.1	3.6	0.0	0.0	0.1	4.3				
Intersection Summary												
HCM 2010 Ctrl Delay			36.3									
HCM 2010 LOS			D									
Notes												

Timings

9: Waterman Av. & Orange Show Rd./Orange Show Rd.

4/6/2017

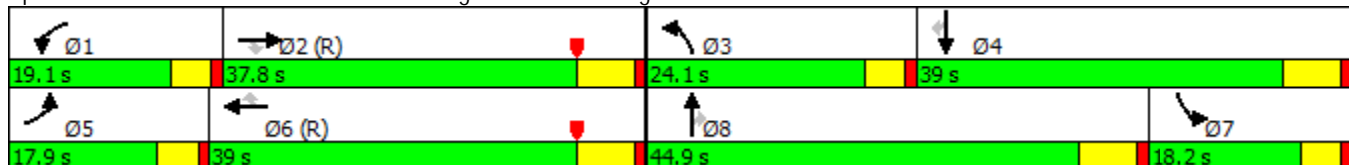


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑	↗	↘↗	↑↑	↗	↘	↑↑	↗
Traffic Volume (vph)	242	849	187	206	611	119	307	1018	196	143	958	155
Future Volume (vph)	242	849	187	206	611	119	307	1018	196	143	958	155
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	9.6	35.2	35.2	9.6	35.2	35.2	9.6	33.2	33.2	9.6	33.2	33.2
Total Split (s)	17.9	37.8	37.8	19.1	39.0	39.0	24.1	44.9	44.9	18.2	39.0	39.0
Total Split (%)	14.9%	31.5%	31.5%	15.9%	32.5%	32.5%	20.1%	37.4%	37.4%	15.2%	32.5%	32.5%
Yellow Time (s)	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2	3.6	5.2	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	Max	None	Max	Max
Act Effect Green (s)	13.3	31.6	31.6	14.5	32.8	32.8	19.5	38.7	38.7	13.6	32.8	32.8
Actuated g/C Ratio	0.11	0.26	0.26	0.12	0.27	0.27	0.16	0.32	0.32	0.11	0.27	0.27
v/c Ratio	1.36	0.94	0.32	1.06	1.31	0.20	1.17	0.92	0.29	0.79	1.02	0.27
Control Delay	231.6	62.0	7.3	129.7	188.6	2.6	152.6	53.1	7.5	79.4	78.2	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	231.6	62.0	7.3	129.7	188.6	2.6	152.6	53.1	7.5	79.4	78.2	9.3
LOS	F	E	A	F	F	A	F	D	A	E	E	A
Approach Delay		86.1			152.0			67.3			69.8	
Approach LOS		F			F			E			E	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 14.1 (12%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.36
 Intersection Signal Delay: 88.6
 Intersection LOS: F
 Intersection Capacity Utilization 105.5%
 ICU Level of Service G
 Analysis Period (min) 15

Splits and Phases: 9: Waterman Av. & Orange Show Rd./Orange Show Rd.



HCM Signalized Intersection Capacity Analysis
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

4/6/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	242	849	187	206	611	119	307	1018	196	143	958	155
Future Volume (vph)	242	849	187	206	611	119	307	1018	196	143	958	155
Ideal Flow (vphpl)	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Total Lost time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1700	3600	1800	1700	1800	1800	1700	3600	1800	1700	3600	1800
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	255	894	197	217	643	125	323	1072	206	151	1008	163
RTOR Reduction (vph)	0	0	138	0	0	91	0	0	121	0	0	101
Lane Group Flow (vph)	255	894	59	217	643	34	323	1072	85	151	1008	62
Confl. Peds. (#/hr)			1						1			
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	13.3	31.6	31.6	14.5	32.8	32.8	19.5	38.7	38.7	13.6	32.8	32.8
Effective Green, g (s)	13.3	31.6	31.6	14.5	32.8	32.8	19.5	38.7	38.7	13.6	32.8	32.8
Actuated g/C Ratio	0.11	0.26	0.26	0.12	0.27	0.27	0.16	0.32	0.32	0.11	0.27	0.27
Clearance Time (s)	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2	4.6	6.2	6.2
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	188	948	474	205	492	492	276	1161	580	192	984	492
v/s Ratio Prot	c0.15	0.25		0.13	c0.36		c0.19	0.30		0.09	c0.28	
v/s Ratio Perm			0.03			0.02			0.05			0.03
v/c Ratio	1.36	0.94	0.12	1.06	1.31	0.07	1.17	0.92	0.15	0.79	1.02	0.13
Uniform Delay, d1	53.4	43.3	33.7	52.8	43.6	32.3	50.2	39.2	28.9	51.8	43.6	32.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	191.0	18.3	0.5	79.2	152.2	0.3	108.3	13.4	0.5	17.5	35.0	0.5
Delay (s)	244.3	61.6	34.2	131.9	195.8	32.6	158.6	52.7	29.4	69.3	78.6	33.3
Level of Service	F	E	C	F	F	C	F	D	C	E	E	C
Approach Delay (s)		92.2			161.0			71.0			72.0	
Approach LOS		F			F			E			E	

























Intersection Summary		
HCM 2000 Control Delay	93.6	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.19	F
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	105.5%	21.6
Analysis Period (min)	15	ICU Level of Service
		G

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
 9: Waterman Av. & Orange Show Rd./Orange Show Rd.

Gateway South Building 4 TIA (JN 10187)

4/6/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	242	849	187	206	611	119	307	1018	196	143	958	155
Future Volume (veh/h)	242	849	187	206	611	119	307	1018	196	143	958	155
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1700	1800	1800	1700	1800	1800	1700	1800	1800	1700	1800	1800
Adj Flow Rate, veh/h	255	894	144	217	643	90	323	1072	155	151	1008	125
Adj No. of Lanes	1	2	1	1	1	1	2	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	179	1815	802	196	973	827	377	1103	493	175	1108	496
Arrive On Green	0.11	0.53	0.53	0.12	0.54	0.54	0.12	0.32	0.32	0.11	0.32	0.32
Sat Flow, veh/h	1619	3420	1510	1619	1800	1530	3141	3420	1529	1619	3420	1530
Grp Volume(v), veh/h	255	894	144	217	643	90	323	1072	155	151	1008	125
Grp Sat Flow(s),veh/h/ln	1619	1710	1510	1619	1800	1530	1570	1710	1529	1619	1710	1530
Q Serve(g_s), s	13.3	19.9	5.9	14.5	30.6	3.9	12.1	37.1	10.1	11.0	33.9	7.2
Cycle Q Clear(g_c), s	13.3	19.9	5.9	14.5	30.6	3.9	12.1	37.1	10.1	11.0	33.9	7.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	179	1815	802	196	973	827	377	1103	493	175	1108	496
V/C Ratio(X)	1.42	0.49	0.18	1.11	0.66	0.11	0.86	0.97	0.31	0.86	0.91	0.25
Avail Cap(c_a), veh/h	179	1815	802	196	973	827	510	1103	493	183	1108	496
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.22	0.22	0.22	1.00	1.00	1.00	0.77	0.77	0.77	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.3	17.9	14.6	52.8	19.7	17.5	51.8	40.1	36.8	52.6	38.9	29.9
Incr Delay (d2), s/veh	196.6	0.2	0.1	96.7	3.5	0.3	6.5	18.0	1.3	29.5	12.5	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.7	9.5	2.5	11.7	16.1	1.7	5.6	20.2	4.4	6.4	17.9	3.2
LnGrp Delay(d),s/veh	250.0	18.1	14.7	149.4	23.2	17.7	58.3	58.1	38.1	82.2	51.4	31.1
LnGrp LOS	F	B	B	F	C	B	E	E	D	F	D	C
Approach Vol, veh/h		1293			950			1550			1284	
Approach Delay, s/veh		63.5			51.5			56.2			53.1	
Approach LOS		E			D			E			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.1	70.9	19.0	45.1	17.9	72.1	19.2	44.9				
Change Period (Y+Rc), s	4.6	6.2	4.6	6.2	4.6	6.2	6.2	* 6.2				
Max Green Setting (Gmax), s	14.5	31.6	19.5	32.8	13.3	32.8	13.6	* 39				
Max Q Clear Time (g_c+I1), s	16.5	21.9	14.1	35.9	15.3	32.6	13.0	39.1				
Green Ext Time (p_c), s	0.0	7.6	0.3	0.0	0.0	0.2	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			56.4									
HCM 2010 LOS			E									
Notes												

Timings
13: Waterman Av. & I-10 WB On Ramp

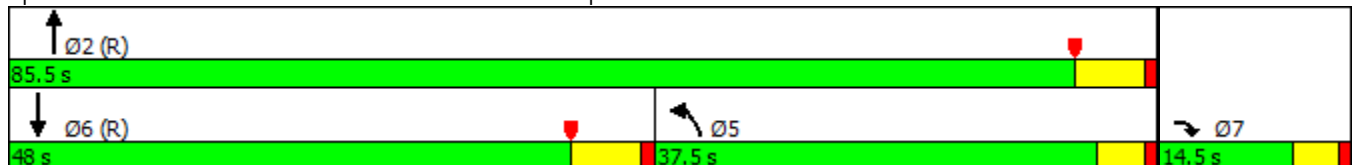


Lane Group	NBL	NBT	SBT	Ø7
Lane Configurations	↶	↑↑	↑↑↑	
Traffic Volume (vph)	622	2021	2023	
Future Volume (vph)	622	2021	2023	
Turn Type	Prot	NA	NA	
Protected Phases	5	2	6	7
Permitted Phases				
Detector Phase	5	2	6	
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	14.5	16.2	16.2	14.5
Total Split (s)	37.5	85.5	48.0	14.5
Total Split (%)	37.5%	85.5%	48.0%	15%
Yellow Time (s)	3.5	5.2	5.2	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	
Total Lost Time (s)	4.5	6.2	6.2	
Lead/Lag	Lag		Lead	
Lead-Lag Optimize?	Yes		Yes	
Recall Mode	None	C-Max	C-Max	None
Act Effct Green (s)	33.0	100.0	56.3	
Actuated g/C Ratio	0.33	1.00	0.56	
v/c Ratio	1.14	0.58	0.96	
Control Delay	113.9	0.6	30.0	
Queue Delay	0.0	0.0	43.7	
Total Delay	113.9	0.6	73.7	
LOS	F	A	E	
Approach Delay		27.3	73.7	
Approach LOS		C	E	

Intersection Summary

Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 130
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.14
 Intersection Signal Delay: 51.6
 Intersection LOS: D
 Intersection Capacity Utilization 104.0%
 ICU Level of Service G
 Analysis Period (min) 15

Splits and Phases: 13: Waterman Av. & I-10 WB On Ramp

















Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗	↘	↑↑	↑↑↓	
Traffic Volume (vph)	0	0	622	2021	2023	876
Future Volume (vph)	0	0	622	2021	2023	876
Ideal Flow (vphpl)	1900	1900	1800	1900	1900	1900
Total Lost time (s)			4.5	6.2	6.2	
Lane Util. Factor			1.00	0.95	0.91	
Frt			1.00	1.00	0.95	
Flt Protected			0.95	1.00	1.00	
Satd. Flow (prot)			1800	3800	5700	
Flt Permitted			0.95	1.00	1.00	
Satd. Flow (perm)			1800	3800	5700	
Peak-hour factor, PHF	0.90	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	676	2197	2199	952
RTOR Reduction (vph)	0	0	0	0	59	0
Lane Group Flow (vph)	0	0	676	2197	3092	0
Turn Type		Prot	Prot	NA	NA	
Protected Phases		7	5	2	6	
Permitted Phases						
Actuated Green, G (s)			33.0	100.0	56.3	
Effective Green, g (s)			33.0	100.0	56.3	
Actuated g/C Ratio			0.33	1.00	0.56	
Clearance Time (s)			4.5	6.2	6.2	
Vehicle Extension (s)			2.0	3.0	3.0	
Lane Grp Cap (vph)			594	3800	3209	
v/s Ratio Prot			c0.38	0.58	c0.54	
v/s Ratio Perm						
v/c Ratio			1.14	0.58	0.96	
Uniform Delay, d1			33.5	0.0	20.9	
Progression Factor			1.00	1.00	1.00	
Incremental Delay, d2			81.2	0.6	9.4	
Delay (s)			114.7	0.6	30.3	
Level of Service			F	A	C	
Approach Delay (s)	0.0			27.5	30.3	
Approach LOS	A			C	C	

Intersection Summary			
HCM 2000 Control Delay	29.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.2
Intersection Capacity Utilization	104.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

									
Movement	EBL	EBR	NBL	NBT	SBT	SBR			
Lane Configurations									
Traffic Volume (veh/h)	0	0	622	2021	2023	876			
Future Volume (veh/h)	0	0	622	2021	2023	876			
Number	7	14	5	2	6	16			
Initial Q (Qb), veh	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	0	1900	1800	1900	1900	1900			
Adj Flow Rate, veh/h	0	0	676	2197	2199	0			
Adj No. of Lanes	0	1	1	2	3	0			
Peak Hour Factor	0.90	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	0	0	0	0	0	0			
Cap, veh/h	0	0	785	3386	2168	0			
Arrive On Green	0.00	0.00	0.46	0.94	0.42	0.00			
Sat Flow, veh/h	0		1714	3705	5529	0			
Grp Volume(v), veh/h	0.0		676	2197	2199	0			
Grp Sat Flow(s),veh/h/ln			1714	1805	1729	0			
Q Serve(g_s), s			35.3	9.6	41.8	0.0			
Cycle Q Clear(g_c), s			35.3	9.6	41.8	0.0			
Prop In Lane			1.00			0.00			
Lane Grp Cap(c), veh/h			785	3386	2168	0			
V/C Ratio(X)			0.86	0.65	1.01	0.00			
Avail Cap(c_a), veh/h			785	3386	2168	0			
HCM Platoon Ratio			1.00	1.00	1.00	1.00			
Upstream Filter(I)			1.00	1.00	0.36	0.00			
Uniform Delay (d), s/veh			24.3	0.5	29.1	0.0			
Incr Delay (d2), s/veh			9.2	1.0	15.3	0.0			
Initial Q Delay(d3),s/veh			0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln			18.5	4.7	23.0	0.0			
LnGrp Delay(d),s/veh			33.5	1.5	44.4	0.0			
LnGrp LOS			C	A	F				
Approach Vol, veh/h				2873	2199				
Approach Delay, s/veh				9.0	44.4				
Approach LOS				A	D				
Timer	1	2	3	4	5	6	7	8	
Assigned Phs		2			5	6			
Phs Duration (G+Y+Rc), s		100.0			52.0	48.0			
Change Period (Y+Rc), s		6.2			6.2	* 6.2			
Max Green Setting (Gmax), s		79.3			33.0	* 42			
Max Q Clear Time (g_c+I1), s		11.6			37.3	43.8			
Green Ext Time (p_c), s		38.3			0.0	0.0			
Intersection Summary									
HCM 2010 Ctrl Delay			24.4						
HCM 2010 LOS			C						
Notes									

APPENDIX 8.11:

**HORIZON YEAR (2040) WITHOUT PROJECT CONDITIONS BASIC FREEWAY SEGMENT
ANALYSIS WORKSHEETS**

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BASIC FREEWAY SEGMENTS WORKSHEET															
General Information		Site Information													
Analyst	BA	Highway/Direction of Travel <i>I-215 Northbound</i>													
Agency or Company	<i>Urban Crossroads, Inc.</i>	From/To	<i>North of Auto Center</i>												
Date Performed	<i>3/20/2017</i>	Jurisdiction	<i>Caltrans</i>												
Analysis Time Period	<i>AM Peak Hour</i>	Analysis Year	<i>2040 Without Project</i>												
Project Description <i>Gateway South Building 4 TIA (JN 10187)</i>															
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)													
<input type="checkbox"/> Planning Data															
Flow Inputs															
Volume, V	6969	veh/h	Peak-Hour Factor, PHF												
AADT		veh/day	0.92												
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T												
Peak-Hr Direction Prop, D			3												
DDHV = AADT x K x D		veh/h	%RVs, P _R												
			0												
			General Terrain: <i>Level</i>												
			Grade % Length <i>mi</i>												
			Up/Down %												
Calculate Flow Adjustments															
f _p	1.00	E _R	1.2												
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)] 0.985													
Speed Inputs		Calc Speed Adj and FFS													
Lane Width	ft	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f_{LW}</td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f_{LC}</td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;">70.0</td> </tr> <tr> <td style="padding: 5px;">FFS (measured)</td> <td style="padding: 5px;">70.0</td> </tr> <tr> <td style="padding: 5px;">Base free-flow Speed, BFFS</td> <td style="padding: 5px;">mph</td> </tr> </table>		f _{LW}	mph	f _{LC}	mph	TRD Adjustment	mph	FFS	70.0	FFS (measured)	70.0	Base free-flow Speed, BFFS	mph
f _{LW}	mph														
f _{LC}	mph														
TRD Adjustment	mph														
FFS	70.0														
FFS (measured)	70.0														
Base free-flow Speed, BFFS	mph														
Rt-Side Lat. Clearance	ft														
Number of Lanes, N	4														
Total Ramp Density, TRD	ramps/mi														
FFS (measured)	70.0														
Base free-flow Speed, BFFS	mph														
LOS and Performance Measures		Design (N)													
<u>Operational (LOS)</u>		<u>Design (N)</u>													
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	1922	pc/h/ln	Design LOS												
S	64.0	mph	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)												
D = v _p / S	30.1	pc/mi/ln	pc/h/ln												
LOS	D		S												
			mph												
			D = v _p / S												
			pc/mi/ln												
			Required Number of Lanes, N												
Glossary		Factor Location													
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8												
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9												
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11												
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3													
DDHV - Directional design hour volume															

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Northbound
Agency or Company	Urban Crossroads, Inc.	From/To	South of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
Flow Inputs			
Volume, V	9038	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			2
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain: Level
			Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})	2481	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	51.0	x f _p)	
D = v _p / S	48.7	S	mph
LOS	F	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Southbound
Agency or Company	Urban Crossroads, Inc.	From/To	North of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8320	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			4
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	1845	Design LOS	
S	65.2	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	28.3	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Southbound
Agency or Company	Urban Crossroads, Inc.	From/To	South of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
Flow Inputs			
Volume, V	8315	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			4
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain: Level
			Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	1844	Design LOS	
S	65.2	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	28.3	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Eastbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
Flow Inputs			
Volume, V	8975	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			10
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.952
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})	2561	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	48.5	x f _p)	
D = v _p / S	52.8	S	mph
LOS	F	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Eastbound
Agency or Company	Urban Crossroads, Inc.	From/To	East of Waterman
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8363	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			11
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.948
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1918	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	64.0	x f _p)	
D = v _p / S	30.0	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Westbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	9953	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			15
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.930
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2907	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	36.2	x f _p)	
mph		S	
D = v _p / S	80.3	mph	
pc/mi/ln		D = v _p / S	
LOS	F	pc/mi/ln	
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel <i>I-10 Westbound</i>	
Agency or Company	<i>Urban Crossroads, Inc.</i>	From/To	<i>East of Waterman</i>
Date Performed	<i>3/20/2017</i>	Jurisdiction	<i>Caltrans</i>
Analysis Time Period	<i>AM Peak Hour</i>	Analysis Year	<i>2040 Without Project</i>
Project Description <i>Gateway South Building 4 TIA (JN 10187)</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	<i>10758</i>	veh/h	Peak-Hour Factor, PHF <i>0.92</i>
AADT		veh/day	%Trucks and Buses, P _T <i>13</i>
Peak-Hr Prop. of AADT, K			%RVs, P _R <i>0</i>
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>
DDHV = AADT x K x D		veh/h	Grade % Length <i>mi</i>
			Up/Down %
Calculate Flow Adjustments			
f _p	<i>1.00</i>	E _R	<i>1.2</i>
E _T	<i>1.5</i>	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)] <i>0.939</i>	
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	<i>4</i>	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	<i>70.0</i>	FFS	<i>70.0</i>
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	<i>3113</i>	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	<i>27.5</i>	x f _p)	
D = v _p / S	<i>113.0</i>	S	mph
LOS	<i>F</i>	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Northbound
Agency or Company	Urban Crossroads, Inc.	From/To	North of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	8255	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			1
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.995
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2254	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	57.1	x f _p)	
mph		S	
D = v _p / S	39.5	mph	
pc/mi/ln		D = v _p / S	
LOS	E	pc/mi/ln	
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Northbound
Agency or Company	Urban Crossroads, Inc.	From/To	South of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	9224	veh/h	Peak-Hour Factor, PHF 0.92
AADT		veh/day	%Trucks and Buses, P _T 2
Peak-Hr Prop. of AADT, K			%RVs, P _R 0
Peak-Hr Direction Prop, D			General Terrain: Level
DDHV = AADT x K x D		veh/h	Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width		ft	
Rt-Side Lat. Clearance		ft	
Number of Lanes, N	4		f _{LW} mph
Total Ramp Density, TRD		ramps/mi	f _{LC} mph
FFS (measured)	70.0	mph	TRD Adjustment mph
Base free-flow Speed, BFFS		mph	FFS 70.0 mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})	2532	pc/h/ln	Design LOS
x f _p)			v _p = (V or DDHV) / (PHF x N x f _{HV})
S	49.4	mph	x f _p)
D = v _p / S	51.2	pc/mi/ln	S
LOS	F		D = v _p / S
			pc/mi/ln
			Required Number of Lanes, N
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Southbound
Agency or Company	Urban Crossroads, Inc.	From/To	North of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
Flow Inputs			
Volume, V	6868	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			2
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
1508	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	68.9	x f _p)	
mph		S	
D = v _p / S	21.9	mph	
pc/mi/ln		D = v _p / S	
LOS	C	pc/mi/ln	
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Southbound
Agency or Company	Urban Crossroads, Inc.	From/To	South of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	10271	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			3
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.985
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2266	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	56.8	x f _p)	
S	mph	S	
D = v _p / S	39.9	S	
pc/mi/ln		D = v _p / S	
LOS	E	pc/mi/ln	
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Eastbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
Flow Inputs			
Volume, V	8030	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			8
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.962
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	2269	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	56.7	x f _p)	
D = v _p / S	40.0	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel <i>I-10 Eastbound</i>	
Agency or Company	<i>Urban Crossroads, Inc.</i>	From/To	<i>East of Waterman</i>
Date Performed	<i>3/20/2017</i>	Jurisdiction	<i>Caltrans</i>
Analysis Time Period	<i>PM Peak Hour</i>	Analysis Year	<i>2040 Without Project</i>
Project Description <i>Gateway South Building 4 TIA (JN 10187)</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8293	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			8
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			<i>Level</i>
			Grade % Length
			<i>mi</i>
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	
0.962			
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
1875	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	64.7	x f _p)	
S	mph	S	mph
D = v _p / S	29.0	D = v _p / S	pc/mi/ln
pc/mi/ln		Required Number of Lanes, N	
LOS	D		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Westbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	10634	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			17
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.922
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})	3135	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	26.6	x f _p)	
D = v _p / S	118.0	S	mph
LOS	F	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel <i>I-10 Westbound</i>	
Agency or Company	<i>Urban Crossroads, Inc.</i>	From/To	<i>East of Waterman</i>
Date Performed	<i>3/20/2017</i>	Jurisdiction	<i>Caltrans</i>
Analysis Time Period	<i>PM Peak Hour</i>	Analysis Year	<i>2040 Without Project</i>
Project Description <i>Gateway South Building 4 TIA (JN 10187)</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	<i>9015</i>	veh/h	Peak-Hour Factor, PHF <i>0.92</i>
AADT		veh/day	%Trucks and Buses, P _T <i>18</i>
Peak-Hr Prop. of AADT, K			%RVs, P _R <i>0</i>
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>
DDHV = AADT x K x D		veh/h	Grade % Length <i>mi</i>
			Up/Down %
Calculate Flow Adjustments			
f _p	<i>1.00</i>	E _R	<i>1.2</i>
E _T	<i>1.5</i>	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)] <i>0.917</i>	
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	<i>4</i>	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	<i>70.0</i>	FFS	<i>70.0</i>
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV}) <i>2670</i>		Design LOS	
x f _p)	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
S	<i>44.9</i>	x f _p)	pc/h/ln
D = v _p / S	<i>59.4</i>	S	mph
LOS	<i>F</i>	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

APPENDIX 8.12:

**HORIZON YEAR (2040) WITH PROJECT CONDITIONS BASIC FREEWAY SEGMENT
ANALYSIS WORKSHEETS**

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BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Northbound
Agency or Company	Urban Crossroads, Inc.	From/To	North of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	6979	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			3
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.985
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1925	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	63.9	x f _p)	
D = v _p / S	30.1	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel <i>I-215 Northbound</i>	
Agency or Company	<i>Urban Crossroads, Inc.</i>	From/To	<i>South of Auto Center</i>
Date Performed	<i>3/20/2017</i>	Jurisdiction	<i>Caltrans</i>
Analysis Time Period	<i>AM Peak Hour</i>	Analysis Year	<i>2040 With Project</i>
Project Description <i>Gateway South Building 4 TIA (JN 10187)</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	9066	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			3
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			<i>Level</i>
			Grade % Length
			<i>mi</i>
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	
			0.985
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2501	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	50.4	x f _p)	
S	mph	S	mph
D = v _p / S	49.7	D = v _p / S	pc/mi/ln
49.7	pc/mi/ln	Required Number of Lanes, N	
LOS	F		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Southbound
Agency or Company	Urban Crossroads, Inc.	From/To	North of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	8344	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			4
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	1850	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	65.1	x f _p)	
D = v _p / S	28.4	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Southbound
Agency or Company	Urban Crossroads, Inc.	From/To	South of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8327	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			4
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain: Level
			Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.980
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	1846	Design LOS	
S	65.2	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	28.3	S	mph
LOS	D	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Eastbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	9002	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			10
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.952
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	2569	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	48.3	x f _p)	
D = v _p / S	53.2	S	mph
LOS	F	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET																	
General Information			Site Information														
Analyst	BA		Highway/Direction of Travel <i>I-10 Eastbound</i>														
Agency or Company	<i>Urban Crossroads, Inc.</i>		From/To <i>East of Waterman</i>														
Date Performed	<i>3/20/2017</i>		Jurisdiction <i>Caltrans</i>														
Analysis Time Period	<i>AM Peak Hour</i>		Analysis Year <i>2040 With Project</i>														
Project Description <i>Gateway South Building 4 TIA (JN 10187)</i>																	
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)		<input type="checkbox"/> Planning Data													
Flow Inputs																	
Volume, V	8373	veh/h	Peak-Hour Factor, PHF	0.92													
AADT		veh/day	%Trucks and Buses, P _T	11													
Peak-Hr Prop. of AADT, K			%RVs, P _R	0													
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>														
DDHV = AADT x K x D		veh/h	Grade %	Length	mi												
			Up/Down %														
Calculate Flow Adjustments																	
f _p	1.00		E _R	1.2													
E _T	1.5		f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)] 0.948														
Speed Inputs			Calc Speed Adj and FFS														
Lane Width	ft		<table style="width:100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">f_{LW}</td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">f_{LC}</td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">TRD Adjustment</td> <td style="padding: 5px;">mph</td> </tr> <tr> <td style="padding: 5px;">FFS</td> <td style="padding: 5px;">70.0</td> </tr> <tr> <td style="padding: 5px;">FFS (measured)</td> <td style="padding: 5px;">70.0</td> </tr> <tr> <td style="padding: 5px;">Base free-flow Speed, BFFS</td> <td style="padding: 5px;">mph</td> </tr> </table>			f _{LW}	mph	f _{LC}	mph	TRD Adjustment	mph	FFS	70.0	FFS (measured)	70.0	Base free-flow Speed, BFFS	mph
f _{LW}	mph																
f _{LC}	mph																
TRD Adjustment	mph																
FFS	70.0																
FFS (measured)	70.0																
Base free-flow Speed, BFFS	mph																
Rt-Side Lat. Clearance	ft																
Number of Lanes, N	5																
Total Ramp Density, TRD	ramps/mi																
FFS (measured)	70.0																
Base free-flow Speed, BFFS	mph																
LOS and Performance Measures			Design (N)														
<u>Operational (LOS)</u>			<u>Design (N)</u>														
v _p = (V or DDHV) / (PHF x N x f _{HV})			Design LOS														
1920	pc/h/ln		v _p = (V or DDHV) / (PHF x N x f _{HV})														
x f _p)			pc/h/ln														
S	64.0		x f _p)														
S	mph		S														
D = v _p / S	30.0		D = v _p / S														
30.0	pc/mi/ln		pc/mi/ln														
LOS	D		Required Number of Lanes, N														
Glossary			Factor Location														
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12		f _{LW} - Exhibit 11-8												
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-13		f _{LC} - Exhibit 11-9												
v _p - Flow rate	FFS - Free-flow speed		f _p - Page 11-18		TRD - Page 11-11												
LOS - Level of service	BFFS - Base free-flow speed		LOS, S, FFS, v _p - Exhibits 11-2, 11-3														
DDHV - Directional design hour volume																	

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Westbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	4/3/2017	Jurisdiction	Caltrans
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	9959	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			15
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.930
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2909	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	36.1	x f _p)	
mph		S	
D = v _p / S	80.5	mph	
pc/mi/ln		D = v _p / S	
LOS	F	pc/mi/ln	
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel <i>I-10 Westbound</i>	
Agency or Company	<i>Urban Crossroads, Inc.</i>	From/To	<i>East of Waterman</i>
Date Performed	<i>3/20/2017</i>	Jurisdiction	<i>Caltrans</i>
Analysis Time Period	<i>AM Peak Hour</i>	Analysis Year	<i>2040 With Project</i>
Project Description <i>Gateway South Building 4 TIA (JN 10187)</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	<i>10782</i>	veh/h	Peak-Hour Factor, PHF <i>0.92</i>
AADT		veh/day	%Trucks and Buses, P _T <i>14</i>
Peak-Hr Prop. of AADT, K			%RVs, P _R <i>0</i>
Peak-Hr Direction Prop, D			General Terrain: <i>Level</i>
DDHV = AADT x K x D		veh/h	Grade % Length <i>mi</i>
			Up/Down %
Calculate Flow Adjustments			
f _p	<i>1.00</i>	E _R	<i>1.2</i>
E _T	<i>1.5</i>	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)] <i>0.935</i>	
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	<i>4</i>	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	<i>70.0</i>	FFS	<i>70.0</i>
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	<i>3135</i>	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	<i>26.6</i>	x f _p)	
D = v _p / S	<i>118.0</i>	S	mph
LOS	<i>F</i>	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Northbound
Agency or Company	Urban Crossroads, Inc.	From/To	North of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	8283	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			1
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.995
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})	2262	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	56.9	x f _p)	
D = v _p / S	39.7	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Northbound
Agency or Company	Urban Crossroads, Inc.	From/To	South of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	9239	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			2
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2536	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	49.3	x f _p)	
S	mph	S	mph
D = v _p / S	51.4	D = v _p / S	pc/mi/ln
51.4	pc/mi/ln	Required Number of Lanes, N	
LOS	F		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Southbound
Agency or Company	Urban Crossroads, Inc.	From/To	North of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	<input type="checkbox"/> Planning Data
Flow Inputs			
Volume, V	6880	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			2
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain: Level
			Grade % Length mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.990
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)		Design LOS	
1511	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	
S	68.9	pc/h/ln	
D = v _p / S	21.9	S	
LOS	C	mph	
		D = v _p / S	
		pc/mi/ln	
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-215 Southbound
Agency or Company	Urban Crossroads, Inc.	From/To	South of Auto Center
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	10304	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			3
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.985
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})	2274	Design LOS	
x f _p)		v _p = (V or DDHV) / (PHF x N x f _{HV})	pc/h/ln
S	56.6	x f _p)	
D = v _p / S	40.2	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Eastbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	3/20/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8045	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			8
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.962
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	2274	Design LOS	
S	56.6	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
D = v _p / S	40.2	S	mph
LOS	E	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel <i>I-10 Eastbound</i>	
Agency or Company	<i>Urban Crossroads, Inc.</i>	From/To	<i>East of Waterman</i>
Date Performed	<i>3/20/2017</i>	Jurisdiction	<i>Caltrans</i>
Analysis Time Period	<i>PM Peak Hour</i>	Analysis Year	<i>2040 With Project</i>
Project Description <i>Gateway South Building 4 TIA (JN 10187)</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	8322	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			8
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			<i>Level</i>
			Grade % Length
			<i>mi</i>
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	
0.962			
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	5	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
1881	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	64.6	x f _p)	
S	mph	S	mph
D = v _p / S	29.1	D = v _p / S	pc/mi/ln
D	pc/mi/ln	Required Number of Lanes, N	
LOS	D		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel	I-10 Westbound
Agency or Company	Urban Crossroads, Inc.	From/To	West of Waterman
Date Performed	4/3/2017	Jurisdiction	Caltrans
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project
Project Description Gateway South Building 4 TIA (JN 10187)			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	10651	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			17
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			Level
			Grade % Length
			mi
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.922
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		mph
LOS and Performance Measures		Design (N)	
Operational (LOS)		Design (N)	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
3140	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	26.3	x f _p)	
S	mph	S	
D = v _p / S	119.2	S	
pc/mi/ln		D = v _p / S	
LOS	F	pc/mi/ln	
		Required Number of Lanes, N	
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET			
General Information		Site Information	
Analyst	BA	Highway/Direction of Travel <i>I-10 Westbound</i>	
Agency or Company	<i>Urban Crossroads, Inc.</i>	From/To	<i>East of Waterman</i>
Date Performed	<i>3/20/2017</i>	Jurisdiction	<i>Caltrans</i>
Analysis Time Period	<i>PM Peak Hour</i>	Analysis Year	<i>2040 With Project</i>
Project Description <i>Gateway South Building 4 TIA (JN 10187)</i>			
<input checked="" type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)	
<input type="checkbox"/> Planning Data			
Flow Inputs			
Volume, V	9028	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	0.92
Peak-Hr Prop. of AADT, K			%Trucks and Buses, P _T
Peak-Hr Direction Prop, D			18
DDHV = AADT x K x D		veh/h	%RVs, P _R
			0
			General Terrain:
			<i>Level</i>
			Grade % Length
			<i>mi</i>
			Up/Down %
Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	
0.917			
Speed Inputs		Calc Speed Adj and FFS	
Lane Width	ft		
Rt-Side Lat. Clearance	ft	f _{LW}	mph
Number of Lanes, N	4	f _{LC}	mph
Total Ramp Density, TRD	ramps/mi	TRD Adjustment	mph
FFS (measured)	70.0	FFS	70.0
Base free-flow Speed, BFFS	mph		
LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV})		Design LOS	
2674	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f _{HV})	
x f _p)		pc/h/ln	
S	44.8	x f _p)	
S	mph	S	mph
D = v _p / S	59.7	D = v _p / S	pc/mi/ln
pc/mi/ln		Required Number of Lanes, N	
LOS	F		
Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

APPENDIX 8.13:

**HORIZON YEAR (2040) WITHOUT PROJECT CONDITIONS RAMP JUNCTION ANALYSIS
WORKSHEETS**

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RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information				Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound	Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Auto Center	Date Performed	3/20/2017
Date Performed	3/20/2017	Jurisdiction	Caltrans	Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project	Project Description Gateway South Building 4 TIA (JN 10187)	
Inputs									
Upstream Adj Ramp	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Freeway Number of Lanes, N	4	Downstream Adj Ramp	<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off		Acceleration Lane Length, L _A	240	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off		Deceleration Lane Length L _D		L _{down} =	ft
L _{up} =	1840 ft	Freeway Volume, V _F	6354	V _D =	veh/h	Ramp Volume, V _R	615		
V _u =	1187 veh/h	Freeway Free-Flow Speed, S _{FF}	65.0			Ramp Free-Flow Speed, S _{FR}	45.0		
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6354	0.92	Level	2	0	0.990	1.00	6976	
Ramp	615	0.92	Level	17	0	0.922	1.00	725	
UpStream	1187	0.92	Level	2	0	0.990	1.00	1303	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.127 using Equation (Exhibit 13-6) V ₁₂ = 887 pc/h V ₃ or V _{av34} = 3044 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2790 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = V ₃ or V _{av34} = Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?		
V _{FO}	7701	Exhibit 13-8	No		V _F	Exhibit 13-8			
					V _{FO} = V _F - V _R	Exhibit 13-8			
					V _R	Exhibit 13-10			
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?		
V _{R12}	3515	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8			
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 31.1 (pc/mi/ln) LOS = D (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S =	0.431 (Exhibit 13-11)				D _s =	(Exhibit 13-12)			
S _R =	55.1 mph (Exhibit 13-11)				S _R =	mph (Exhibit 13-12)			
S ₀ =	59.3 mph (Exhibit 13-11)				S ₀ =	mph (Exhibit 13-12)			
S =	57.3 mph (Exhibit 13-13)				S =	mph (Exhibit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	4	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Freeway Volume, V _F	7541	L _{down} =	1260 ft	Freeway Free-Flow Speed, S _{FF}	65.0
L _{up} =	Ramp Number of Lanes, N	2	V _D =	Ramp Volume, V _R	1497			Ramp Free-Flow Speed, S _{FR}	45.0
V _u =	Acceleration Lane Length, L _A			Freeway Free-Flow Speed, S _{FF}	65.0				
	Deceleration Lane Length L _D	975		Ramp Free-Flow Speed, S _{FR}	45.0				
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	7541	0.92	Level	2	0	0.990	1.00	8279	
Ramp	1497	0.92	Level	5	0	0.976	1.00	1668	
UpStream									
DownStream	1187	0.92	Level	2	0	0.990	1.00	1303	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 3387 pc/h V ₃ or V _{av34} 2446 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	8279	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	6611	Exhibit 13-8	9400	No
					V _R	1668	Exhibit 13-10	4200	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	3387	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 14.3 (pc/mi/ln) LOS = B (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S =	(Exhibit 13-11)				D _S =	0.448 (Exhibit 13-12)			
S _R =	mph (Exhibit 13-11)				S _R =	54.7 mph (Exhibit 13-12)			
S ₀ =	mph (Exhibit 13-11)				S ₀ =	65.7 mph (Exhibit 13-12)			
S =	mph (Exhibit 13-13)				S =	60.7 mph (Exhibit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N	5	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 1790 ft V _D = 864 veh/h	Ramp Number of Lanes, N	1	Acceleration Lane Length, L _A		Deceleration Lane Length L _D	180
	Freeway Volume, V _F	6608		Ramp Volume, V _R	1712	Freeway Free-Flow Speed, S _{FF}	65.0	Ramp Free-Flow Speed, S _{FR}	45.0
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6608	0.92	Level	4	0	0.980	1.00	7326	
Ramp	1712	0.92	Level	2	0	0.990	1.00	1879	
UpStream									
DownStream	864	0.92	Level	6	0	0.971	1.00	967	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 3615 pc/h V ₃ or V _{av34} 1123 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	5861	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	3982	Exhibit 13-8	9400	No
					V _R	1879	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	3615	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 33.7 (pc/mi/ln) LOS = D (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11)					D _S = 0.467 (Exhibit 13-12)				
S _R = mph (Exhibit 13-11)					S _R = 54.3 mph (Exhibit 13-12)				
S ₀ = mph (Exhibit 13-11)					S ₀ = 70.8 mph (Exhibit 13-12)				
S = mph (Exhibit 13-13)					S = 59.6 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information				Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Upstream)						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N		4		Downstream Adj Ramp				
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N		1		<input type="checkbox"/> Yes <input type="checkbox"/> On				
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A		200		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off				
L _{up} = 1070 ft	Deceleration Lane Length L _D				L _{down} = ft				
V _u = 864 veh/h	Freeway Volume, V _F		7472		V _D = veh/h				
	Ramp Volume, V _R		426						
	Freeway Free-Flow Speed, S _{FF}		65.0						
	Ramp Free-Flow Speed, S _{FR}		45.0						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	7472	0.92	Level	4	0	0.980	1.00	8284	
Ramp	426	0.92	Level	15	0	0.930	1.00	498	
UpStream	864	0.92	Level	6	0	0.971	1.00	967	
DownStream									
Merge Areas				Diverge Areas					
Estimation of v ₁₂				Estimation of v ₁₂					
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.156 using Equation (Exhibit 13-6) V ₁₂ = 1289 pc/h V ₃ or V _{av34} = 3497 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 3313 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks				Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	8782	Exhibit 13-8		No	V _F	Exhibit 13-8			
					V _{FO} = V _F - V _R	Exhibit 13-8			
					V _R	Exhibit 13-10			
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	3811	Exhibit 13-8		No	V ₁₂	Exhibit 13-8			
Level of Service Determination (if not F)				Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 33.7 (pc/mi/ln) LOS = D (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					
Speed Determination				Speed Determination					
M _S = 0.479 (Exhibit 13-11)				D _s = (Exhibit 13-12)					
S _R = 54.0 mph (Exhibit 13-11)				S _R = mph (Exhibit 13-12)					
S ₀ = 57.4 mph (Exhibit 13-11)				S ₀ = mph (Exhibit 13-12)					
S = 55.8 mph (Exhibit 13-13)				S = mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET													
General Information				Site Information									
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound										
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Downstream)										
Date Performed	3/20/2017	Jurisdiction	Caltrans										
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project										
Project Description Gateway South Building 4 TIA (JN 10187)													
Inputs													
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N	5					Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 1115 ft V _D = 162 veh/h	Ramp Number of Lanes, N	1				
	Acceleration Lane Length, L _A	200											
	Deceleration Lane Length L _D												
	Freeway Volume, V _F	8153											
	Ramp Volume, V _R	426											
	Freeway Free-Flow Speed, S _{FF}	65.0											
	Ramp Free-Flow Speed, S _{FR}	45.0											
Conversion to pc/h Under Base Conditions													
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p					
Freeway	8153	0.92	Level	4	0	0.980	1.00	9039					
Ramp	426	0.92	Level	15	0	0.930	1.00	498					
UpStream													
DownStream	162	0.92	Level	6	0	0.971	1.00	181					
Merge Areas				Diverge Areas									
Estimation of v ₁₂				Estimation of v ₁₂									
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.156 using Equation (Exhibit 13-6) V ₁₂ = 1017 pc/h V ₃ or V _{av34} = 2761 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2615 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = V ₃ or V _{av34} = Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)									
Capacity Checks				Capacity Checks									
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?				
V _{FO}	7037	Exhibit 13-8		No	V _F		Exhibit 13-8						
					V _{FO} = V _F - V _R		Exhibit 13-8						
					V _R		Exhibit 13-10						
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area									
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?				
V _{R12}	3113	Exhibit 13-8	4600:All	No	V ₁₂		Exhibit 13-8						
Level of Service Determination (if not F)				Level of Service Determination (if not F)									
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 28.3 (pc/mi/ln) LOS = D (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)									
Speed Determination				Speed Determination									
M _S =	0.391 (Exhibit 13-11)			D _s =	(Exhibit 13-12)								
S _R =	56.0 mph (Exhibit 13-11)			S _R =	mph (Exhibit 13-12)								
S ₀ =	59.7 mph (Exhibit 13-11)			S ₀ =	mph (Exhibit 13-12)								
S =	58.0 mph (Exhibit 13-13)			S =	mph (Exhibit 13-13)								

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Eastbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Waterman						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N Ramp Number of Lanes, N Acceleration Lane Length, L _A Deceleration Lane Length L _D Freeway Volume, V _F Ramp Volume, V _R Freeway Free-Flow Speed, S _{FF} Ramp Free-Flow Speed, S _{FR}	4 1 1500 7690 1285 65.0 45.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 2950 ft V _D = 673 veh/h						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	7690	0.92	Level	11	0	0.948	1.00	8818	
Ramp	1285	0.92	Level	3	0	0.985	1.00	1418	
UpStream									
DownStream	673	0.92	Level	7	0	0.966	1.00	757	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 4644 pc/h V ₃ or V _{av34} 2087 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	8818	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	7400	Exhibit 13-8	9400	No
					V _R	1418	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	4644	Exhibit 13-8	4400:All	Yes
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 30.7 (pc/mi/ln) LOS = D (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11)					D _S = 0.426 (Exhibit 13-12)				
S _R = mph (Exhibit 13-11)					S _R = 55.2 mph (Exhibit 13-12)				
S ₀ = mph (Exhibit 13-11)					S ₀ = 67.1 mph (Exhibit 13-12)				
S = mph (Exhibit 13-13)					S = 60.3 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET								
General Information				Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Eastbound					
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman					
Date Performed	3/20/2017	Jurisdiction	Caltrans					
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project					
Project Description Gateway South Building 4 TIA (JN 10187)								
Inputs								
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp					
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On					
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	1500	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off					
L _{up} = 2950 ft	Deceleration Lane Length L _D		L _{down} = ft					
V _u = 1285 veh/h	Freeway Volume, V _F	7690	V _D = veh/h					
	Ramp Volume, V _R	673						
	Freeway Free-Flow Speed, S _{FF}	65.0						
	Ramp Free-Flow Speed, S _{FR}	45.0						
Conversion to pc/h Under Base Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	7690	0.92	Level	11	0	0.948	1.00	8818
Ramp	673	0.92	Level	7	0	0.966	1.00	757
UpStream	1285	0.92	Level	3	0	0.985	1.00	1418
DownStream								
Merge Areas				Diverge Areas				
Estimation of v ₁₂				Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.123 using Equation (Exhibit 13-6) V ₁₂ = 1086 pc/h V ₃ or V _{av34} = 3866 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 3527 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}	9575	Exhibit 13-8	Yes	V _F		Exhibit 13-8		
				V _{FO} = V _F - V _R		Exhibit 13-8		
				V _R		Exhibit 13-10		
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}	4284	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)				Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 29.1 (pc/mi/ln) LOS = F (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination				Speed Determination				
M _S = 0.469 (Exhibit 13-11)				D _s = (Exhibit 13-12)				
S _R = 54.2 mph (Exhibit 13-11)				S _R = mph (Exhibit 13-12)				
S ₀ = 56.4 mph (Exhibit 13-11)				S ₀ = mph (Exhibit 13-12)				
S = 55.4 mph (Exhibit 13-13)				S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Westbound						
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	2040 Without Project						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N		4		Downstream Adj Ramp				
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N		1		<input type="checkbox"/> Yes <input type="checkbox"/> On				
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A		1500		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off				
L _{up} = 1815 ft	Deceleration Lane Length L _D				L _{down} = ft				
V _u = 1268 veh/h	Freeway Volume, V _F		9490		V _D = veh/h				
	Ramp Volume, V _R		463						
	Freeway Free-Flow Speed, S _{FF}		65.0						
	Ramp Free-Flow Speed, S _{FR}		45.0						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	9490	0.92	Level	15	0	0.930	1.00	11089	
Ramp	463	0.92	Level	7	0	0.966	1.00	521	
UpStream	1268	0.92	Level	3	0	0.985	1.00	1399	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.153 using Equation (Exhibit 13-6) V ₁₂ = 1693 pc/h V ₃ or V _{av34} = 4698 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 5689 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	11610	Exhibit 13-8		Yes	V _F		Exhibit 13-8		
					V _{FO} = V _F - V _R		Exhibit 13-8		
					V _R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	6210	Exhibit 13-8	4600:All	Yes	V ₁₂		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 44.3 (pc/mi/ln) LOS = F (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = 2.127 (Exhibit 13-11)					D _s = (Exhibit 13-12)				
S _R = 16.1 mph (Exhibit 13-11)					S _R = mph (Exhibit 13-12)				
S ₀ = 56.1 mph (Exhibit 13-11)					S ₀ = mph (Exhibit 13-12)				
S = 24.1 mph (Exhibit 13-13)					S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA		Freeway/Dir of Travel	I-10 Westbound					
Agency or Company	Urban Crossroads, Inc.		Junction	Off-Ramp at Waterman					
Date Performed	3/20/2017		Jurisdiction	Caltrans					
Analysis Time Period	AM Peak Hour		Analysis Year	2040 Without Project					
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N		4		Downstream Adj Ramp				
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N		1		<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On				
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A				<input type="checkbox"/> No <input type="checkbox"/> Off				
L _{up} = ft	Deceleration Lane Length L _D		1500		L _{down} = 1815 ft				
V _u = veh/h	Freeway Volume, V _F		9490		V _D = 463 veh/h				
	Ramp Volume, V _R		1268						
	Freeway Free-Flow Speed, S _{FF}		65.0						
	Ramp Free-Flow Speed, S _{FR}		45.0						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	9490	0.92	Level	15	0	0.930	1.00	11089	
Ramp	1268	0.92	Level	3	0	0.985	1.00	1399	
UpStream									
DownStream	463	0.92	Level	7	0	0.966	1.00	521	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 5624 pc/h V ₃ or V _{av34} 2732 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = 5689 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	11089	Exhibit 13-8	9400	Yes
					V _{FO} = V _F - V _R	9690	Exhibit 13-8	9400	Yes
					V _R	1399	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	5624	Exhibit 13-8	4400:All	Yes
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 39.7 (pc/mi/ln) LOS = F (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11)					D _S = 0.424 (Exhibit 13-12)				
S _R = mph (Exhibit 13-11)					S _R = 55.3 mph (Exhibit 13-12)				
S ₀ = mph (Exhibit 13-11)					S ₀ = 64.7 mph (Exhibit 13-12)				
S = mph (Exhibit 13-13)					S = 59.5 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound						
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Auto Center						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp						
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On						
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	240	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off						
L _{up} = 1840 ft	Deceleration Lane Length L _D		L _{down} = ft						
V _u = 1127 veh/h	Freeway Volume, V _F	7136	V _D = veh/h						
	Ramp Volume, V _R	1119							
	Freeway Free-Flow Speed, S _{FF}	65.0							
	Ramp Free-Flow Speed, S _{FR}	45.0							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	7136	0.92	Level	1	0	0.995	1.00	7795	
Ramp	1119	0.92	Level	2	0	0.990	1.00	1228	
UpStream	1127	0.92	Level	2	0	0.990	1.00	1237	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.064 using Equation (Exhibit 13-6) V ₁₂ = 501 pc/h V ₃ or V _{av34} = 3647 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 3118 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = V ₃ or V _{av34} = Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity	LOS F?			Actual	Capacity	LOS F?	
V _{FO}	9023	Exhibit 13-8	No		V _F	Exhibit 13-8			
					V _{FO} = V _F - V _R	Exhibit 13-8			
					V _R	Exhibit 13-10			
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}	4346	Exhibit 13-8	4600:All		No	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 37.3 (pc/mi/ln) LOS = E (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = 0.600 (Exhibit 13-11)					D _s = (Exhibit 13-12)				
S _R = 51.2 mph (Exhibit 13-11)					S _R = mph (Exhibit 13-12)				
S ₀ = 58.2 mph (Exhibit 13-11)					S ₀ = mph (Exhibit 13-12)				
S = 54.6 mph (Exhibit 13-13)					S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound							
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center							
Date Performed	3/20/2017	Jurisdiction	Caltrans							
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project							
Project Description Gateway South Building 4 TIA (JN 10187)										
Inputs										
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N Ramp Number of Lanes, N Acceleration Lane Length, L _A Deceleration Lane Length L _D Freeway Volume, V _F Ramp Volume, V _R Freeway Free-Flow Speed, S _{FF} Ramp Free-Flow Speed, S _{FR}	4 2 975 8263 961 65.0 45.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off	L _{down} = 1260 ft V _D = 1127 veh/h						
L _{up} = ft										
V _u = veh/h										
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	8263	0.92	Level	1	0	0.995	1.00	9026		
Ramp	961	0.92	Level	5	0	0.976	1.00	1071		
UpStream										
DownStream	1127	0.92	Level	2	0	0.990	1.00	1237		
Merge Areas					Diverge Areas					
Estimation of v ₁₂					Estimation of v ₁₂					
L _{EQ} =	V ₁₂ = V _F (P _{FM})	(Equation 13-6 or 13-7)			L _{EQ} =	V ₁₂ = V _R + (V _F - V _R)P _{FD}	(Equation 13-12 or 13-13)			
P _{FM} =	using Equation (Exhibit 13-6)				P _{FD} =	0.260 using Equation (Exhibit 13-7)				
V ₁₂ =	pc/h				V ₁₂ =	3139 pc/h				
V ₃ or V _{av34}	pc/h (Equation 13-14 or 13-17)				V ₃ or V _{av34}	2943 pc/h (Equation 13-14 or 13-17)				
Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 2,700 pc/h?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, V _{12a} =	pc/h (Equation 13-16, 13-18, or 13-19)				If Yes, V _{12a} =	3626 pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 13-8			V _F	9026	Exhibit 13-8		9400	No
					V _{FO} = V _F - V _R	7955	Exhibit 13-8		9400	No
					V _R	1071	Exhibit 13-10		4200	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	3139	Exhibit 13-8		4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
D _R =	5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A				D _R =	4.252 + 0.0086 V ₁₂ - 0.009 L _D				
D _R =	(pc/mi/ln)				D _R =	16.4 (pc/mi/ln)				
LOS =	(Exhibit 13-2)				LOS =	B (Exhibit 13-2)				
Speed Determination					Speed Determination					
M _S =	(Exhibit 13-11)				D _S =	0.394 (Exhibit 13-12)				
S _R =	mph (Exhibit 13-11)				S _R =	55.9 mph (Exhibit 13-12)				
S ₀ =	mph (Exhibit 13-11)				S ₀ =	64.7 mph (Exhibit 13-12)				
S =	mph (Exhibit 13-13)				S =	60.9 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	5	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	Freeway Volume, V _F	5738	L _{down} =	1790 ft	Freeway Free-Flow Speed, S _{FF}	65.0
L _{up} =	Ramp Number of Lanes, N	1	V _D =	Ramp Volume, V _R	1130			Ramp Free-Flow Speed, S _{FR}	45.0
V _u =	Acceleration Lane Length, L _A			Freeway Free-Flow Speed, S _{FF}	65.0				
	Deceleration Lane Length L _D	180		Ramp Free-Flow Speed, S _{FR}	45.0				
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	5738	0.92	Level	1	0	0.995	1.00	6268	
Ramp	1130	0.92	Level	6	0	0.971	1.00	1265	
UpStream									
DownStream	1316	0.92	Level	3	0	0.985	1.00	1452	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 3036 pc/h V ₃ or V _{av34} 1146 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	5328	Exhibit 13-8	9400	No
					V _{FO} = V _F - V _R	4063	Exhibit 13-8	9400	No
					V _R	1265	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	3036	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 28.7 (pc/mi/ln) LOS = D (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S =	(Exhibit 13-11)				D _S =	0.412 (Exhibit 13-12)			
S _R =	mph (Exhibit 13-11)				S _R =	55.5 mph (Exhibit 13-12)			
S ₀ =	mph (Exhibit 13-11)				S ₀ =	70.7 mph (Exhibit 13-12)			
S =	mph (Exhibit 13-13)				S =	61.2 mph (Exhibit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Upstream)						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N = 4				Downstream Adj Ramp				
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N = 1				<input type="checkbox"/> Yes <input type="checkbox"/> On				
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A = 200				<input checked="" type="checkbox"/> No <input type="checkbox"/> Off				
	Deceleration Lane Length L _D				L _{down} = ft				
L _{up} = 1070 ft	Freeway Volume, V _F = 7054				V _D = veh/h				
V _u = 1316 veh/h	Ramp Volume, V _R = 1097								
	Freeway Free-Flow Speed, S _{FF} = 65.0								
	Ramp Free-Flow Speed, S _{FR} = 45.0								
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	7054	0.92	Level	2	0	0.990	1.00	7744	
Ramp	1097	0.92	Level	5	0	0.976	1.00	1222	
UpStream	1316	0.92	Level	3	0	0.985	1.00	1452	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.065 using Equation (Exhibit 13-6) V ₁₂ = 504 pc/h V ₃ or V _{av34} = 3620 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 3097 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity	LOS F?			Actual	Capacity	LOS F?	
V _{FO}	8966	Exhibit 13-8	No		V _F	Exhibit 13-8			
					V _{FO} = V _F - V _R	Exhibit 13-8			
					V _R	Exhibit 13-10			
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}	4319	Exhibit 13-8	4600:All		No	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 37.3 (pc/mi/ln) LOS = E (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = 0.596 (Exhibit 13-11)					D _s = (Exhibit 13-12)				
S _R = 51.3 mph (Exhibit 13-11)					S _R = mph (Exhibit 13-12)				
S ₀ = 58.3 mph (Exhibit 13-11)					S ₀ = mph (Exhibit 13-12)				
S = 54.7 mph (Exhibit 13-13)					S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Downstream)						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp						
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On						
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A	200	<input type="checkbox"/> No <input type="checkbox"/> Off						
L _{up} = ft	Deceleration Lane Length L _D		L _{down} = 1115 ft						
V _u = veh/h	Freeway Volume, V _F	9923	V _D = 348 veh/h						
	Ramp Volume, V _R	1097							
	Freeway Free-Flow Speed, S _{FF}	65.0							
	Ramp Free-Flow Speed, S _{FR}	45.0							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	9923	0.92	Level	2	0	0.990	1.00	10894	
Ramp	1097	0.92	Level	5	0	0.976	1.00	1222	
UpStream									
DownStream	348	0.92	Level	5	0	0.976	1.00	388	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.065 using Equation (Exhibit 13-6) V ₁₂ = 546 pc/h V ₃ or V _{av34} = 3924 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 3357 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity	LOS F?			Actual	Capacity	LOS F?	
V _{FO}	9616	Exhibit 13-8	No		V _F	Exhibit 13-8			
					V _{FO} = V _F - V _R	Exhibit 13-8			
					V _R	Exhibit 13-10			
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}	4579	Exhibit 13-8	4600:All		No	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 39.4 (pc/mi/ln) LOS = E (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = 0.683 (Exhibit 13-11)					D _s = (Exhibit 13-12)				
S _R = 49.3 mph (Exhibit 13-11)					S _R = mph (Exhibit 13-12)				
S ₀ = 57.2 mph (Exhibit 13-11)					S ₀ = mph (Exhibit 13-12)				
S = 53.1 mph (Exhibit 13-13)					S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst	BA	Freeway/Dir of Travel	I-10 Eastbound							
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Waterman							
Date Performed	3/20/2017	Jurisdiction	Caltrans							
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project							
Project Description Gateway South Building 4 TIA (JN 10187)										
Inputs										
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N Ramp Number of Lanes, N Acceleration Lane Length, L _A Deceleration Lane Length L _D Freeway Volume, V _F Ramp Volume, V _R Freeway Free-Flow Speed, S _{FF} Ramp Free-Flow Speed, S _{FR}	4 1 1500 7160 870 65.0 45.0					Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	L _{down} = 2950 ft V _D = 1133 veh/h		
L _{up} = ft V _u = veh/h										
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	7160	0.92	Level	8	0	0.962	1.00	8094		
Ramp	870	0.92	Level	3	0	0.985	1.00	960		
UpStream										
DownStream	1133	0.92	Level	4	0	0.980	1.00	1256		
Merge Areas					Diverge Areas					
Estimation of v ₁₂					Estimation of v ₁₂					
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 4070 pc/h V ₃ or V _{av34} 2012 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 13-8			V _F	8094	Exhibit 13-8	9400	No	
					V _{FO} = V _F - V _R	7134	Exhibit 13-8	9400	No	
					V _R	960	Exhibit 13-10	2100	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?		
V _{R12}		Exhibit 13-8			V ₁₂	4070	Exhibit 13-8	4400:All	No	
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 25.8 (pc/mi/ln) LOS = C (Exhibit 13-2)					
Speed Determination					Speed Determination					
M _S = (Exhibit 13-11)					D _S = 0.384 (Exhibit 13-12)					
S _R = mph (Exhibit 13-11)					S _R = 56.2 mph (Exhibit 13-12)					
S ₀ = mph (Exhibit 13-11)					S ₀ = 67.4 mph (Exhibit 13-12)					
S = mph (Exhibit 13-13)					S = 61.2 mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET								
General Information				Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Eastbound					
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman					
Date Performed	3/20/2017	Jurisdiction	Caltrans					
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project					
Project Description Gateway South Building 4 TIA (JN 10187)								
Inputs								
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp					
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On					
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	1500	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off					
L _{up} = 2950 ft	Deceleration Lane Length L _D		L _{down} = ft					
V _u = 870 veh/h	Freeway Volume, V _F	7160	V _D = veh/h					
	Ramp Volume, V _R	1133						
	Freeway Free-Flow Speed, S _{FF}	65.0						
	Ramp Free-Flow Speed, S _{FR}	45.0						
Conversion to pc/h Under Base Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	7160	0.92	Level	8	0	0.962	1.00	8094
Ramp	1133	0.92	Level	4	0	0.980	1.00	1256
UpStream	870	0.92	Level	3	0	0.985	1.00	960
DownStream								
Merge Areas				Diverge Areas				
Estimation of v ₁₂				Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.061 using Equation (Exhibit 13-6) V ₁₂ = 492 pc/h V ₃ or V _{av34} = 3801 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 3237 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}	9350	Exhibit 13-8	No	V _F		Exhibit 13-8		
				V _{FO} = V _F - V _R		Exhibit 13-8		
				V _R		Exhibit 13-10		
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}	4493	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)				Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 30.5 (pc/mi/ln) LOS = D (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination				Speed Determination				
M _S = 0.535 (Exhibit 13-11)				D _s = (Exhibit 13-12)				
S _R = 52.7 mph (Exhibit 13-11)				S _R = mph (Exhibit 13-12)				
S ₀ = 57.7 mph (Exhibit 13-11)				S ₀ = mph (Exhibit 13-12)				
S = 55.2 mph (Exhibit 13-13)				S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Westbound						
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N		4		Downstream Adj Ramp				
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N		1		<input type="checkbox"/> Yes <input type="checkbox"/> On				
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A		1500		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off				
L _{up} = 1815 ft	Deceleration Lane Length L _D				L _{down} = ft				
V _u = 783 veh/h	Freeway Volume, V _F		8232		V _D = veh/h				
	Ramp Volume, V _R		2402						
	Freeway Free-Flow Speed, S _{FF}		65.0						
	Ramp Free-Flow Speed, S _{FR}		45.0						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	8232	0.92	Level	20	0	0.909	1.00	9843	
Ramp	2402	0.92	Level	1	0	0.995	1.00	2624	
UpStream	783	0.92	Level	2	0	0.990	1.00	860	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = -0.110 using Equation (Exhibit 13-6) P _{FM} = -1084 pc/h V ₁₂ = 5463 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 4443 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = using Equation (Exhibit 13-7) P _{FD} = pc/h V ₁₂ = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	12467	Exhibit 13-8		Yes	V _F		Exhibit 13-8		
					V _{FO} = V _F - V _R		Exhibit 13-8		
					V _R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	7067	Exhibit 13-8		4600:All	Yes	V ₁₂		Exhibit 13-8	
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 50.0 (pc/mi/ln) LOS = F (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S =	4.759 (Exhibit 13-11)				D _s =	(Exhibit 13-12)			
S _R =	-44.5 mph (Exhibit 13-11)				S _R =	mph (Exhibit 13-12)			
S ₀ =	56.1 mph (Exhibit 13-11)				S ₀ =	mph (Exhibit 13-12)			
S =	mph (Exhibit 13-13)				S =	mph (Exhibit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Westbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Waterman						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	2040 Without Project						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N 4						Downstream Adj Ramp		
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N 1						<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On		
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A						<input type="checkbox"/> No <input type="checkbox"/> Off		
L _{up} = ft	Deceleration Lane Length L _D 1500						L _{down} = 1815 ft		
V _u = veh/h	Freeway Volume, V _F 8232						V _D = 2402 veh/h		
	Ramp Volume, V _R 783								
	Freeway Free-Flow Speed, S _{FF} 65.0								
	Ramp Free-Flow Speed, S _{FR} 45.0								
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	8232	0.92	Level	20	0	0.909	1.00	9843	
Ramp	783	0.92	Level	2	0	0.990	1.00	860	
UpStream									
DownStream	2402	0.92	Level	1	0	0.995	1.00	2624	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 4777 pc/h V ₃ or V _{av34} 2533 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	9843	Exhibit 13-8	9400	Yes
					V _{FO} = V _F - V _R	8983	Exhibit 13-8	9400	No
					V _R	860	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	4777	Exhibit 13-8	4400:All	Yes
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 31.8 (pc/mi/ln) LOS = F (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11)					D _S = 0.375 (Exhibit 13-12)				
S _R = mph (Exhibit 13-11)					S _R = 56.4 mph (Exhibit 13-12)				
S ₀ = mph (Exhibit 13-11)					S ₀ = 65.3 mph (Exhibit 13-12)				
S = mph (Exhibit 13-13)					S = 60.6 mph (Exhibit 13-13)				

APPENDIX 8.14:

**HORIZON YEAR (2040) WITH PROJECT CONDITIONS RAMP JUNCTION ANALYSIS
WORKSHEETS**

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RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information				Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound	Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Auto Center	Date Performed	3/20/2017
Date Performed	3/20/2017	Jurisdiction	Caltrans	Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project	Project Description Gateway South Building 4 TIA (JN 10187)	
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp	Freeway Volume, V _F	6354				
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Volume, V _R	625				
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	240	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Free-Flow Speed, S _{FF}	65.0				
L _{up} = 1840 ft	Deceleration Lane Length L _D		L _{down} = ft	Ramp Free-Flow Speed, S _{FR}	45.0				
V _u = 1187 veh/h	Freeway Free-Flow Speed, S _{FF}	65.0	V _D = veh/h	Ramp Free-Flow Speed, S _{FR}	45.0				
	Ramp Free-Flow Speed, S _{FR}	45.0							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6354	0.92	Level	2	0	0.990	1.00	6976	
Ramp	625	0.92	Level	17	0	0.922	1.00	737	
UpStream	1187	0.92	Level	2	0	0.990	1.00	1303	
DownStream									
Merge Areas				Diverge Areas					
Estimation of v₁₂				Estimation of v₁₂					
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.126 using Equation (Exhibit 13-6) V ₁₂ = 877 pc/h V ₃ or V _{av34} = 3049 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 2790 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = V ₃ or V _{av34} = Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks				Capacity Checks					
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?		
V _{FO}	7713	Exhibit 13-8	No	V _F		Exhibit 13-8			
				V _{FO} = V _F - V _R		Exhibit 13-8			
				V _R		Exhibit 13-10			
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area					
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?		
V _{R12}	3527	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8			
Level of Service Determination (if not F)				Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 31.1 (pc/mi/ln) LOS = D (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					
Speed Determination				Speed Determination					
M _S = 0.432 (Exhibit 13-11)				D _s = (Exhibit 13-12)					
S _R = 55.1 mph (Exhibit 13-11)				S _R = mph (Exhibit 13-12)					
S ₀ = 59.3 mph (Exhibit 13-11)				S ₀ = mph (Exhibit 13-12)					
S = 57.3 mph (Exhibit 13-13)				S = mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound							
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center							
Date Performed	3/20/2017	Jurisdiction	Caltrans							
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project							
Project Description Gateway South Building 4 TIA (JN 10187)										
Inputs										
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N Ramp Number of Lanes, N Acceleration Lane Length, L _A Deceleration Lane Length L _D Freeway Volume, V _F Ramp Volume, V _R Freeway Free-Flow Speed, S _{FF} Ramp Free-Flow Speed, S _{FR}	4 2 975 7541 1525 65.0 45.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off	L _{down} = 1260 ft V _D = 1187 veh/h						L _{up} = ft V _u = veh/h
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	7541	0.92	Level	2	0	0.990	1.00	8279		
Ramp	1525	0.92	Level	5	0	0.976	1.00	1699		
UpStream										
DownStream	1187	0.92	Level	2	0	0.990	1.00	1303		
Merge Areas					Diverge Areas					
Estimation of v ₁₂					Estimation of v ₁₂					
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.260 using Equation (Exhibit 13-7) V ₁₂ = 3410 pc/h V ₃ or V _{av34} 2434 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 13-8			V _F	8279	Exhibit 13-8	9400	No	
					V _{FO} = V _F - V _R	6580	Exhibit 13-8	9400	No	
					V _R	1699	Exhibit 13-10	4200	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?		
V _{R12}		Exhibit 13-8			V ₁₂	3410	Exhibit 13-8	4400:All	No	
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 14.5 (pc/mi/ln) LOS = B (Exhibit 13-2)					
Speed Determination					Speed Determination					
M _S = (Exhibit 13-11)					D _S = 0.451 (Exhibit 13-12)					
S _R = mph (Exhibit 13-11)					S _R = 54.6 mph (Exhibit 13-12)					
S ₀ = mph (Exhibit 13-11)					S ₀ = 65.7 mph (Exhibit 13-12)					
S = mph (Exhibit 13-13)					S = 60.6 mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	Freeway Number of Lanes, N	5	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 1790 ft V _D = 864 veh/h	Ramp Number of Lanes, N	1	Acceleration Lane Length, L _A		Deceleration Lane Length L _D	180
	Freeway Volume, V _F	6608		Ramp Volume, V _R	1736	Freeway Free-Flow Speed, S _{FF}	65.0	Ramp Free-Flow Speed, S _{FR}	45.0
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	6608	0.92	Level	4	0	0.980	1.00	7326	
Ramp	1736	0.92	Level	3	0	0.985	1.00	1915	
UpStream									
DownStream	864	0.92	Level	6	0	0.971	1.00	967	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 3635 pc/h V ₃ or V _{av34} 1113 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	5861	Exhibit 13-8	9400	No
			V _{FO} = V _F - V _R	3946	Exhibit 13-8	9400	No		
			V _R	1915	Exhibit 13-10	2100	No		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	3635	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 33.9 (pc/mi/ln) LOS = D (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = (Exhibit 13-11)					D _S = 0.470 (Exhibit 13-12)				
S _R = mph (Exhibit 13-11)					S _R = 54.2 mph (Exhibit 13-12)				
S ₀ = mph (Exhibit 13-11)					S ₀ = 70.9 mph (Exhibit 13-12)				
S = mph (Exhibit 13-13)					S = 59.5 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information				Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Upstream)						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N		4		Downstream Adj Ramp				
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N		1		<input type="checkbox"/> Yes <input type="checkbox"/> On				
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A		200		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off				
L _{up} = 1070 ft	Deceleration Lane Length L _D				L _{down} = ft				
V _u = 864 veh/h	Freeway Volume, V _F		7472		V _D = veh/h				
	Ramp Volume, V _R		438						
	Freeway Free-Flow Speed, S _{FF}		65.0						
	Ramp Free-Flow Speed, S _{FR}		45.0						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	7472	0.92	Level	4	0	0.980	1.00	8284	
Ramp	438	0.92	Level	15	0	0.930	1.00	512	
UpStream	864	0.92	Level	6	0	0.971	1.00	967	
DownStream									
Merge Areas				Diverge Areas					
Estimation of v ₁₂				Estimation of v ₁₂					
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.154 using Equation (Exhibit 13-6) V ₁₂ = 1274 pc/h V ₃ or V _{av34} = 3505 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 3313 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks				Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	8796	Exhibit 13-8		No		V _F	Exhibit 13-8		
						V _{FO} = V _F - V _R	Exhibit 13-8		
						V _R	Exhibit 13-10		
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	3825	Exhibit 13-8		No		V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)				Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 33.8 (pc/mi/ln) LOS = D (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					
Speed Determination				Speed Determination					
M _S = 0.482 (Exhibit 13-11) S _R = 53.9 mph (Exhibit 13-11) S ₀ = 57.4 mph (Exhibit 13-11) S = 55.8 mph (Exhibit 13-13)				D _s = (Exhibit 13-12) S _R = mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-12) S = mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information				Site Information					
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound	Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Downstream)	Date Performed	3/20/2017
Date Performed	3/20/2017	Jurisdiction	Caltrans	Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project	Project Description Gateway South Building 4 TIA (JN 10187)	
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N 5 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A 200 Deceleration Lane Length L _D Freeway Volume, V _F 8165 Ramp Volume, V _R 438 Freeway Free-Flow Speed, S _{FF} 65.0 Ramp Free-Flow Speed, S _{FR} 45.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	L _{up} = ft	L _{down} = 1115 ft	V _u = veh/h	V _D = 162 veh/h			
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	8165	0.92	Level	4	0	0.980	1.00	9052	
Ramp	438	0.92	Level	15	0	0.930	1.00	512	
UpStream									
DownStream	162	0.92	Level	6	0	0.971	1.00	181	
Merge Areas				Diverge Areas					
Estimation of v₁₂				Estimation of v₁₂					
L _{EQ} =	V ₁₂ = V _F (P _{FM}) (Equation 13-6 or 13-7)				L _{EQ} =	V ₁₂ = V _R + (V _F - V _R)P _{FD} (Equation 13-12 or 13-13)			
P _{FM} =	0.154 using Equation (Exhibit 13-6)				P _{FD} =	using Equation (Exhibit 13-7)			
V ₁₂ =	1008 pc/h				V ₁₂ =	pc/h			
V ₃ or V _{av34}	2772 pc/h (Equation 13-14 or 13-17)				V ₃ or V _{av34}	pc/h (Equation 13-14 or 13-17)			
Is V ₃ or V _{av34} > 2,700 pc/h?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No			
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input type="checkbox"/> Yes <input type="checkbox"/> No			
If Yes, V _{12a} =	2620 pc/h (Equation 13-16, 13-18, or 13-19)				If Yes, V _{12a} =	pc/h (Equation 13-16, 13-18, or 13-19)			
Capacity Checks				Capacity Checks					
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?		
V _{FO}	7064	Exhibit 13-8	No	V _F		Exhibit 13-8			
				V _{FO} = V _F - V _R		Exhibit 13-8			
				V _R		Exhibit 13-10			
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area					
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?		
V _{R12}	3132	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8			
Level of Service Determination (if not F)				Level of Service Determination (if not F)					
D _R =	5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A				D _R =	4.252 + 0.0086 V ₁₂ - 0.009 L _D			
D _R =	28.4 (pc/mi/ln)				D _R =	(pc/mi/ln)			
LOS =	D (Exhibit 13-2)				LOS =	(Exhibit 13-2)			
Speed Determination				Speed Determination					
M _S =	0.392 (Exhibit 13-11)				D _s =	(Exhibit 13-12)			
S _R =	56.0 mph (Exhibit 13-11)				S _R =	mph (Exhibit 13-12)			
S ₀ =	59.7 mph (Exhibit 13-11)				S ₀ =	mph (Exhibit 13-12)			
S =	58.0 mph (Exhibit 13-13)				S =	mph (Exhibit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst	BA	Freeway/Dir of Travel	I-10 Eastbound							
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Waterman							
Date Performed	3/20/2017	Jurisdiction	Caltrans							
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project							
Project Description Gateway South Building 4 TIA (JN 10187)										
Inputs										
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N Ramp Number of Lanes, N Acceleration Lane Length, L _A Deceleration Lane Length L _D Freeway Volume, V _F Ramp Volume, V _R Freeway Free-Flow Speed, S _{FF} Ramp Free-Flow Speed, S _{FR}	4 1 1500 7690 1312 65.0 45.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	L _{down} = 2950 ft V _D = 683 veh/h	L _{up} = ft V _u = veh/h					
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	7690	0.92	Level	11	0	0.948	1.00	8818		
Ramp	1312	0.92	Level	3	0	0.985	1.00	1447		
UpStream										
DownStream	683	0.92	Level	7	0	0.966	1.00	768		
Merge Areas					Diverge Areas					
Estimation of v ₁₂					Estimation of v ₁₂					
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 4661 pc/h V ₃ or V _{av34} 2078 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 13-8			V _F	8818	Exhibit 13-8	9400	No	
					V _{FO} = V _F - V _R	7371	Exhibit 13-8	9400	No	
					V _R	1447	Exhibit 13-10	2100	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?		
V _{R12}		Exhibit 13-8			V ₁₂	4661	Exhibit 13-8	4400:All	Yes	
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 30.8 (pc/mi/ln) LOS = D (Exhibit 13-2)					
Speed Determination					Speed Determination					
M _S = (Exhibit 13-11)					D _S = 0.428 (Exhibit 13-12)					
S _R = mph (Exhibit 13-11)					S _R = 55.2 mph (Exhibit 13-12)					
S ₀ = mph (Exhibit 13-11)					S ₀ = 67.1 mph (Exhibit 13-12)					
S = mph (Exhibit 13-13)					S = 60.2 mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET								
General Information				Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Eastbound					
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman					
Date Performed	3/20/2017	Jurisdiction	Caltrans					
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project					
Project Description Gateway South Building 4 TIA (JN 10187)								
Inputs								
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp					
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On					
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	1500	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off					
L _{up} = 2950 ft	Deceleration Lane Length L _D		L _{down} = ft					
V _u = 1312 veh/h	Freeway Volume, V _F	7690	V _D = veh/h					
	Ramp Volume, V _R	683						
	Freeway Free-Flow Speed, S _{FF}	65.0						
	Ramp Free-Flow Speed, S _{FR}	45.0						
Conversion to pc/h Under Base Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	7690	0.92	Level	11	0	0.948	1.00	8818
Ramp	683	0.92	Level	7	0	0.966	1.00	768
UpStream	1312	0.92	Level	3	0	0.985	1.00	1447
DownStream								
Merge Areas				Diverge Areas				
Estimation of v ₁₂				Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.122 using Equation (Exhibit 13-6) V ₁₂ = 1074 pc/h V ₃ or V _{av34} = 3872 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 3527 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}	9586	Exhibit 13-8	Yes	V _F		Exhibit 13-8		
				V _{FO} = V _F - V _R		Exhibit 13-8		
				V _R		Exhibit 13-10		
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}	4295	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)				Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 29.2 (pc/mi/ln) LOS = F (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination				Speed Determination				
M _S = 0.472 (Exhibit 13-11)				D _s = (Exhibit 13-12)				
S _R = 54.1 mph (Exhibit 13-11)				S _R = mph (Exhibit 13-12)				
S ₀ = 56.4 mph (Exhibit 13-11)				S ₀ = mph (Exhibit 13-12)				
S = 55.4 mph (Exhibit 13-13)				S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET								
General Information				Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Westbound					
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman					
Date Performed	4/3/2017	Jurisdiction	Caltrans					
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project					
Project Description Gateway South Building 4 TIA (JN 10187)								
Inputs								
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp					
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On					
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	1500	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off					
L _{up} = 1815 ft	Deceleration Lane Length L _D		L _{down} = ft					
V _u = 1292 veh/h	Freeway Volume, V _F	9490	V _D = veh/h					
	Ramp Volume, V _R	469						
	Freeway Free-Flow Speed, S _{FF}	65.0						
	Ramp Free-Flow Speed, S _{FR}	45.0						
Conversion to pc/h Under Base Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	9490	0.92	Level	15	0	0.930	1.00	11089
Ramp	469	0.92	Level	7	0	0.966	1.00	528
UpStream	1292	0.92	Level	3	0	0.985	1.00	1425
DownStream								
Merge Areas				Diverge Areas				
Estimation of v ₁₂				Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.152 using Equation (Exhibit 13-6) V ₁₂ = 1683 pc/h V ₃ or V _{av34} = 4703 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 5689 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}	11617	Exhibit 13-8	Yes	V _F		Exhibit 13-8		
				V _{FO} = V _F - V _R		Exhibit 13-8		
				V _R		Exhibit 13-10		
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}	6217	Exhibit 13-8	4600:All	Yes	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)				Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 44.3 (pc/mi/ln) LOS = F (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination				Speed Determination				
M _S = 2.141 (Exhibit 13-11)				D _s = (Exhibit 13-12)				
S _R = 15.8 mph (Exhibit 13-11)				S _R = mph (Exhibit 13-12)				
S ₀ = 56.1 mph (Exhibit 13-11)				S ₀ = mph (Exhibit 13-12)				
S = 23.7 mph (Exhibit 13-13)				S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Westbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Waterman						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	AM Peak Hour	Analysis Year	2040 With Project						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	4	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	Freeway Volume, V _F	9490	L _{down} =	1815 ft	Freeway Free-Flow Speed, S _{FF}	65.0
L _{up} =	Ramp Number of Lanes, N	1	V _D =	Ramp Volume, V _R	1292	Freeway Free-Flow Speed, S _{FF}	65.0	Ramp Free-Flow Speed, S _{FR}	45.0
V _u =	Acceleration Lane Length, L _A			Deceleration Lane Length L _D	1500				
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	9490	0.92	Level	15	0	0.930	1.00	11089	
Ramp	1292	0.92	Level	3	0	0.985	1.00	1425	
UpStream									
DownStream	463	0.92	Level	7	0	0.966	1.00	521	
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
L _{EQ} =	V ₁₂ = V _F (P _{FM}) (Equation 13-6 or 13-7)				L _{EQ} =	V ₁₂ = V _R + (V _F - V _R)P _{FD} (Equation 13-12 or 13-13)			
P _{FM} =	using Equation (Exhibit 13-6)				P _{FD} =	0.436 using Equation (Exhibit 13-7)			
V ₁₂ =	pc/h				V ₁₂ =	5639 pc/h			
V ₃ or V _{av34}	pc/h (Equation 13-14 or 13-17)				V ₃ or V _{av34}	2725 pc/h (Equation 13-14 or 13-17)			
Is V ₃ or V _{av34} > 2,700 pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 2,700 pc/h?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
If Yes, V _{12a} =	pc/h (Equation 13-16, 13-18, or 13-19)				If Yes, V _{12a} =	5689 pc/h (Equation 13-16, 13-18, or 13-19)			
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	11089	Exhibit 13-8	9400	Yes
					V _{FO} = V _F - V _R	9664	Exhibit 13-8	9400	Yes
					V _R	1425	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	5639	Exhibit 13-8	4400:All	Yes
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
D _R =	5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A				D _R =	4.252 + 0.0086 V ₁₂ - 0.009 L _D			
D _R =	(pc/mi/ln)				D _R =	39.7 (pc/mi/ln)			
LOS =	(Exhibit 13-2)				LOS =	F (Exhibit 13-2)			
Speed Determination					Speed Determination				
M _S =	(Exhibit 13-11)				D _S =	0.426 (Exhibit 13-12)			
S _R =	mph (Exhibit 13-11)				S _R =	55.2 mph (Exhibit 13-12)			
S ₀ =	mph (Exhibit 13-11)				S ₀ =	64.7 mph (Exhibit 13-12)			
S =	mph (Exhibit 13-13)				S =	59.4 mph (Exhibit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound						
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Auto Center						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N	4	Downstream Adj Ramp						
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On						
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A	240	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off						
L _{up} = 1840 ft	Deceleration Lane Length L _D		L _{down} = ft						
V _u = 1127 veh/h	Freeway Volume, V _F	7136	V _D = veh/h						
	Ramp Volume, V _R	1147							
	Freeway Free-Flow Speed, S _{FF}	65.0							
	Ramp Free-Flow Speed, S _{FR}	45.0							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	7136	0.92	Level	1	0	0.995	1.00	7795	
Ramp	1147	0.92	Level	3	0	0.985	1.00	1265	
UpStream	1127	0.92	Level	2	0	0.990	1.00	1237	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.060 using Equation (Exhibit 13-6) V ₁₂ = 465 pc/h V ₃ or V _{av34} = 3665 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 3118 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity	LOS F?			Actual	Capacity	LOS F?	
V _{FO}	9060	Exhibit 13-8	No		V _F	Exhibit 13-8			
					V _{FO} = V _F - V _R	Exhibit 13-8			
					V _R	Exhibit 13-10			
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V _{R12}	4383	Exhibit 13-8	4600:All		No	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 37.6 (pc/mi/ln) LOS = E (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = 0.612 (Exhibit 13-11)					D _s = (Exhibit 13-12)				
S _R = 50.9 mph (Exhibit 13-11)					S _R = mph (Exhibit 13-12)				
S ₀ = 58.2 mph (Exhibit 13-11)					S ₀ = mph (Exhibit 13-12)				
S = 54.5 mph (Exhibit 13-13)					S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Northbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	4	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off						
$L_{up} =$ ft	Ramp Number of Lanes, N	2	$L_{down} =$ 1260 ft						
$V_u =$ veh/h	Acceleration Lane Length, L_A		$V_D =$ 1127 veh/h						
	Deceleration Lane Length L_D	975							
	Freeway Volume, V_F	8263							
	Ramp Volume, V_R	976							
	Freeway Free-Flow Speed, S_{FF}	65.0							
	Ramp Free-Flow Speed, S_{FR}	45.0							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	8263	0.92	Level	1	0	0.995	1.00	9026	
Ramp	976	0.92	Level	5	0	0.976	1.00	1087	
UpStream									
DownStream	1127	0.92	Level	2	0	0.990	1.00	1237	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$L_{EQ} =$	$V_{12} = V_F (P_{FM})$	(Equation 13-6 or 13-7)			$L_{EQ} =$	$V_{12} = V_R + (V_F - V_R)P_{FD}$	(Equation 13-12 or 13-13)		
$P_{FM} =$	using Equation (Exhibit 13-6)				$P_{FD} =$	0.260 using Equation (Exhibit 13-7)			
$V_{12} =$	pc/h				$V_{12} =$	3151 pc/h			
V_3 or V_{av34}	pc/h (Equation 13-14 or 13-17)				V_3 or V_{av34}	2937 pc/h (Equation 13-14 or 13-17)			
Is V_3 or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V_3 or $V_{av34} > 2,700$ pc/h?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)				If Yes, $V_{12a} =$	3626 pc/h (Equation 13-16, 13-18, or 13-19)			
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8			V_F	9026	Exhibit 13-8	9400	No
					$V_{FO} = V_F - V_R$	7939	Exhibit 13-8	9400	No
					V_R	1087	Exhibit 13-10	4200	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8			V_{12}	3151	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$				
$D_R =$ (pc/mi/ln)					$D_R =$ 16.4 (pc/mi/ln)				
LOS = (Exhibit 13-2)					LOS = B (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ (Exhibit 13-11)					$D_S =$ 0.396 (Exhibit 13-12)				
$S_R =$ mph (Exhibit 13-11)					$S_R =$ 55.9 mph (Exhibit 13-12)				
$S_0 =$ mph (Exhibit 13-11)					$S_0 =$ 64.7 mph (Exhibit 13-12)				
$S =$ mph (Exhibit 13-13)					$S =$ 60.8 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET											
General Information					Site Information						
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound								
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Auto Center								
Date Performed	3/20/2017	Jurisdiction	Caltrans								
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project								
Project Description Gateway South Building 4 TIA (JN 10187)											
Inputs											
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	5	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	Freeway Volume, V_F	5738	$L_{down} =$	1790 ft	Freeway Free-Flow Speed, S_{FF}	65.0	$V_D =$	1316 veh/h
$L_{up} =$	Ramp Number of Lanes, N	1		Ramp Volume, V_R	1142			Ramp Free-Flow Speed, S_{FR}	45.0		
$V_u =$	Acceleration Lane Length, L_A			Freeway Free-Flow Speed, S_{FF}	65.0						
	Deceleration Lane Length L_D	180		Ramp Free-Flow Speed, S_{FR}	45.0						
Conversion to pc/h Under Base Conditions											
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$			
Freeway	5738	0.92	Level	1	0	0.995	1.00	6268			
Ramp	1142	0.92	Level	6	0	0.971	1.00	1279			
UpStream											
DownStream	1316	0.92	Level	3	0	0.985	1.00	1452			
Merge Areas					Diverge Areas						
Estimation of v_{12}					Estimation of v_{12}						
$L_{EQ} =$	$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)				$L_{EQ} =$	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)					
$P_{FM} =$	using Equation (Exhibit 13-6)				$P_{FD} =$	0.436 using Equation (Exhibit 13-7)					
$V_{12} =$	pc/h				$V_{12} =$	3044 pc/h					
V_3 or V_{av34}	pc/h (Equation 13-14 or 13-17)				V_3 or V_{av34}	1142 pc/h (Equation 13-14 or 13-17)					
Is V_3 or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V_3 or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input type="checkbox"/> No				Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)				If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks					Capacity Checks						
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?		
V_{FO}		Exhibit 13-8			V_F	5328	Exhibit 13-8	9400	No		
			$V_{FO} = V_F - V_R$	4049	Exhibit 13-8	9400	No				
			V_R	1279	Exhibit 13-10	2100	No				
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area						
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?			
V_{R12}		Exhibit 13-8			V_{12}	3044	Exhibit 13-8	4400:All	No		
Level of Service Determination (if not F)					Level of Service Determination (if not F)						
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$						
$D_R =$	(pc/mi/ln)				$D_R =$	28.8 (pc/mi/ln)					
LOS =	(Exhibit 13-2)				LOS =	D (Exhibit 13-2)					
Speed Determination					Speed Determination						
$M_S =$	(Exhibit 13-11)				$D_S =$	0.413 (Exhibit 13-12)					
$S_R =$	mph (Exhibit 13-11)				$S_R =$	55.5 mph (Exhibit 13-12)					
$S_0 =$	mph (Exhibit 13-11)				$S_0 =$	70.8 mph (Exhibit 13-12)					
$S =$	mph (Exhibit 13-13)				$S =$	61.1 mph (Exhibit 13-13)					

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Upstream)						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off		Freeway Number of Lanes, N	4	Downstream Adj Ramp	<input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off		Ramp Number of Lanes, N	1
$L_{up} =$	1070 ft	Acceleration Lane Length, L_A	200	Freeway Volume, V_F	7054	$L_{down} =$	ft	Deceleration Lane Length, L_D	
$V_u =$	1316 veh/h	Ramp Volume, V_R	1130	Freeway Free-Flow Speed, S_{FF}	65.0	$V_D =$	veh/h	Ramp Free-Flow Speed, S_{FR}	45.0
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	7054	0.92	Level	2	0	0.990	1.00	7744	
Ramp	1130	0.92	Level	5	0	0.976	1.00	1259	
UpStream	1316	0.92	Level	3	0	0.985	1.00	1452	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$L_{EQ} =$	$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)				$L_{EQ} =$	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)			
$P_{FM} =$	0.060 using Equation (Exhibit 13-6)				$P_{FD} =$	using Equation (Exhibit 13-7)			
$V_{12} =$	468 pc/h				$V_{12} =$	pc/h			
V_3 or V_{av34}	3638 pc/h (Equation 13-14 or 13-17)				V_3 or V_{av34}	pc/h (Equation 13-14 or 13-17)			
Is V_3 or $V_{av34} > 2,700$ pc/h?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				Is V_3 or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No			
Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input type="checkbox"/> No			
If Yes, $V_{12a} =$	3097 pc/h (Equation 13-16, 13-18, or 13-19)				If Yes, $V_{12a} =$	pc/h (Equation 13-16, 13-18, or 13-19)			
Capacity Checks					Capacity Checks				
	Actual	Capacity	LOS F?			Actual	Capacity	LOS F?	
V_{FO}	9003	Exhibit 13-8	No		V_F		Exhibit 13-8		
					$V_{FO} = V_F - V_R$		Exhibit 13-8		
					V_R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?	
V_{R12}	4356	Exhibit 13-8	4600:All		No	V_{12}	Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R =$	$5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$				$D_R =$	$4.252 + 0.0086 V_{12} - 0.009 L_D$			
$D_R =$	37.6 (pc/mi/ln)				$D_R =$	(pc/mi/ln)			
LOS =	E (Exhibit 13-2)				LOS =	(Exhibit 13-2)			
Speed Determination					Speed Determination				
$M_S =$	0.607 (Exhibit 13-11)				$D_s =$	(Exhibit 13-12)			
$S_R =$	51.0 mph (Exhibit 13-11)				$S_R =$	mph (Exhibit 13-12)			
$S_0 =$	58.3 mph (Exhibit 13-11)				$S_0 =$	mph (Exhibit 13-12)			
$S =$	54.6 mph (Exhibit 13-13)				$S =$	mph (Exhibit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET								
General Information				Site Information				
Analyst	BA	Freeway/Dir of Travel	I-210 Southbound					
Agency or Company	Urban Crossroads, Inc.	Junction	Loop On-Ramp (Downstream)					
Date Performed	3/20/2017	Jurisdiction	Caltrans					
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project					
Project Description Gateway South Building 4 TIA (JN 10187)								
Inputs								
Upstream Adj Ramp	Freeway Number of Lanes, N	5	Downstream Adj Ramp					
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On					
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L _A	200	<input type="checkbox"/> No <input type="checkbox"/> Off					
L _{up} = ft	Deceleration Lane Length L _D		L _{down} = 1115 ft					
V _u = veh/h	Freeway Volume, V _F	9956	V _D = 348 veh/h					
	Ramp Volume, V _R	1130						
	Freeway Free-Flow Speed, S _{FF}	65.0						
	Ramp Free-Flow Speed, S _{FR}	45.0						
Conversion to pc/h Under Base Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	9956	0.92	Level	3	0	0.985	1.00	10984
Ramp	1130	0.92	Level	5	0	0.976	1.00	1259
UpStream								
DownStream	348	0.92	Level	5	0	0.976	1.00	388
Merge Areas				Diverge Areas				
Estimation of v ₁₂				Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.060 using Equation (Exhibit 13-6) V ₁₂ = 513 pc/h V ₃ or V _{av34} = 3985 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 3393 pc/h (Equation 13-16, 13-18, or 13-19)				$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks				Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V _{FO}	9743	Exhibit 13-8	No	V _F		Exhibit 13-8		
				V _{FO} = V _F - V _R		Exhibit 13-8		
				V _R		Exhibit 13-10		
Flow Entering Merge Influence Area				Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V _{R12}	4652	Exhibit 13-8	4600:All	Yes	V ₁₂	Exhibit 13-8		
Level of Service Determination (if not F)				Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 39.9 (pc/mi/ln) LOS = E (Exhibit 13-2)				$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination				Speed Determination				
M _S = 0.712 (Exhibit 13-11)				D _s = (Exhibit 13-12)				
S _R = 48.6 mph (Exhibit 13-11)				S _R = mph (Exhibit 13-12)				
S ₀ = 57.0 mph (Exhibit 13-11)				S ₀ = mph (Exhibit 13-12)				
S = 52.7 mph (Exhibit 13-13)				S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Eastbound						
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Waterman						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N	4	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off						
$L_{up} =$ ft	Ramp Number of Lanes, N	1	$L_{down} =$ 2950 ft						
$V_u =$ veh/h	Acceleration Lane Length, L_A		$V_D =$ 1162 veh/h						
	Deceleration Lane Length L_D	1500							
	Freeway Volume, V_F	7160							
	Ramp Volume, V_R	885							
	Freeway Free-Flow Speed, S_{FF}	65.0							
	Ramp Free-Flow Speed, S_{FR}	45.0							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	7160	0.92	Level	8	0	0.962	1.00	8094	
Ramp	885	0.92	Level	4	0	0.980	1.00	981	
UpStream									
DownStream	1162	0.92	Level	4	0	0.980	1.00	1288	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$L_{EQ} =$	$V_{12} = V_F (P_{FM})$	(Equation 13-6 or 13-7)	$L_{EQ} =$	$V_{12} = V_R + (V_F - V_R)P_{FD}$	(Equation 13-12 or 13-13)				
$P_{FM} =$	using Equation	(Exhibit 13-6)	$P_{FD} =$	0.436 using Equation	(Exhibit 13-7)				
$V_{12} =$	pc/h		$V_{12} =$	4082 pc/h					
V_3 or V_{av34}	pc/h	(Equation 13-14 or 13-17)	V_3 or V_{av34}	2006 pc/h	(Equation 13-14 or 13-17)				
Is V_3 or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input type="checkbox"/> No		Is V_3 or $V_{av34} > 2,700$ pc/h?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input type="checkbox"/> No		Is V_3 or $V_{av34} > 1.5 * V_{12}/2$	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
If Yes, $V_{12a} =$	pc/h	(Equation 13-16, 13-18, or 13-19)	If Yes, $V_{12a} =$	pc/h	(Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?		
V_{FO}		Exhibit 13-8		V_F	8094	Exhibit 13-8	9400	No	
				$V_{FO} = V_F - V_R$	7113	Exhibit 13-8	9400	No	
				V_R	981	Exhibit 13-10	2100	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?		
V_{R12}		Exhibit 13-8		V_{12}	4082	Exhibit 13-8	4400:All	No	
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$				
$D_R =$ (pc/mi/ln)					$D_R =$ 25.9 (pc/mi/ln)				
LOS = (Exhibit 13-2)					LOS = C (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ (Exhibit 13-11)					$D_S =$ 0.386 (Exhibit 13-12)				
$S_R =$ mph (Exhibit 13-11)					$S_R =$ 56.1 mph (Exhibit 13-12)				
$S_0 =$ mph (Exhibit 13-11)					$S_0 =$ 67.4 mph (Exhibit 13-12)				
$S =$ mph (Exhibit 13-13)					$S =$ 61.2 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Eastbound						
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman						
Date Performed	3/20/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N		4		Downstream Adj Ramp				
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N		1		<input type="checkbox"/> Yes <input type="checkbox"/> On				
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A		1500		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off				
L _{up} = 2950 ft	Deceleration Lane Length L _D				L _{down} = ft				
V _u = 885 veh/h	Freeway Volume, V _F		7160		V _D = veh/h				
	Ramp Volume, V _R		1162						
	Freeway Free-Flow Speed, S _{FF}		65.0						
	Ramp Free-Flow Speed, S _{FR}		45.0						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	7160	0.92	Level	8	0	0.962	1.00	8094	
Ramp	1162	0.92	Level	4	0	0.980	1.00	1288	
UpStream	885	0.92	Level	4	0	0.980	1.00	981	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v ₁₂					Estimation of v ₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.057 using Equation (Exhibit 13-6) V ₁₂ = 460 pc/h V ₃ or V _{av34} = 3817 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 3237 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	9382	Exhibit 13-8		No	V _F		Exhibit 13-8		
					V _{FO} = V _F - V _R		Exhibit 13-8		
					V _R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	4525	Exhibit 13-8	4600:All	No	V ₁₂		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 30.8 (pc/mi/ln) LOS = D (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = 0.546 (Exhibit 13-11)					D _s = (Exhibit 13-12)				
S _R = 52.4 mph (Exhibit 13-11)					S _R = mph (Exhibit 13-12)				
S ₀ = 57.7 mph (Exhibit 13-11)					S ₀ = mph (Exhibit 13-12)				
S = 55.0 mph (Exhibit 13-13)					S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	BA	Freeway/Dir of Travel	I-10 Westbound						
Agency or Company	Urban Crossroads, Inc.	Junction	On-Ramp at Waterman						
Date Performed	4/3/2017	Jurisdiction	Caltrans						
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project						
Project Description Gateway South Building 4 TIA (JN 10187)									
Inputs									
Upstream Adj Ramp	Freeway Number of Lanes, N		4		Downstream Adj Ramp				
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N		1		<input type="checkbox"/> Yes <input type="checkbox"/> On				
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L _A		1500		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off				
L _{up} = 1815 ft	Deceleration Lane Length L _D				L _{down} = ft				
V _u = 796 veh/h	Freeway Volume, V _F		8232		V _D = veh/h				
	Ramp Volume, V _R		2419						
	Freeway Free-Flow Speed, S _{FF}		65.0						
	Ramp Free-Flow Speed, S _{FR}		45.0						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	8232	0.92	Level	20	0	0.909	1.00	9843	
Ramp	2419	0.92	Level	1	0	0.995	1.00	2642	
UpStream	796	0.92	Level	3	0	0.985	1.00	878	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = -0.112 using Equation (Exhibit 13-6) P _{FM} = -1106 pc/h V ₁₂ = 5474 pc/h (Equation 13-14 or 13-17) V ₃ or V _{av34} = 5474 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = 4443 pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = using Equation (Exhibit 13-7) P _{FD} = pc/h V ₁₂ = pc/h (Equation 13-14 or 13-17) V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	12485	Exhibit 13-8		Yes	V _F		Exhibit 13-8		
					V _{FO} = V _F - V _R		Exhibit 13-8		
					V _R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	7085	Exhibit 13-8		4600:All	Yes	V ₁₂		Exhibit 13-8	
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 50.1 (pc/mi/ln) LOS = F (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				
Speed Determination					Speed Determination				
M _S = 4.842 (Exhibit 13-11)					D _s = (Exhibit 13-12)				
S _R = -46.4 mph (Exhibit 13-11)					S _R = mph (Exhibit 13-12)				
S ₀ = 56.1 mph (Exhibit 13-11)					S ₀ = mph (Exhibit 13-12)				
S = mph (Exhibit 13-13)					S = mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst	BA	Freeway/Dir of Travel	I-10 Westbound							
Agency or Company	Urban Crossroads, Inc.	Junction	Off-Ramp at Waterman							
Date Performed	3/20/2017	Jurisdiction	Caltrans							
Analysis Time Period	PM Peak Hour	Analysis Year	2040 With Project							
Project Description Gateway South Building 4 TIA (JN 10187)										
Inputs										
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Freeway Number of Lanes, N Ramp Number of Lanes, N Acceleration Lane Length, L _A Deceleration Lane Length L _D Freeway Volume, V _F Ramp Volume, V _R Freeway Free-Flow Speed, S _{FF} Ramp Free-Flow Speed, S _{FR}	4 1 1500 8232 796 65.0 45.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off	L _{down} = 1815 ft V _D = 2402 veh/h						L _{up} = ft V _u = veh/h
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	8232	0.92	Level	20	0	0.909	1.00	9843		
Ramp	796	0.92	Level	3	0	0.985	1.00	878		
UpStream										
DownStream	2402	0.92	Level	1	0	0.995	1.00	2624		
Merge Areas					Diverge Areas					
Estimation of v ₁₂					Estimation of v ₁₂					
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.436 using Equation (Exhibit 13-7) V ₁₂ = 4787 pc/h V ₃ or V _{av34} 2528 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 13-8			V _F	9843	Exhibit 13-8	9400	Yes	
					V _{FO} = V _F - V _R	8965	Exhibit 13-8	9400	No	
					V _R	878	Exhibit 13-10	2100	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable	Violation?			Actual	Max Desirable	Violation?		
V _{R12}		Exhibit 13-8			V ₁₂	4787	Exhibit 13-8	4400:All	Yes	
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D _R = 31.9 (pc/mi/ln) LOS = F (Exhibit 13-2)					
Speed Determination					Speed Determination					
M _S = (Exhibit 13-11)					D _S = 0.377 (Exhibit 13-12)					
S _R = mph (Exhibit 13-11)					S _R = 56.3 mph (Exhibit 13-12)					
S ₀ = mph (Exhibit 13-11)					S ₀ = 65.3 mph (Exhibit 13-12)					
S = mph (Exhibit 13-13)					S = 60.6 mph (Exhibit 13-13)					