APPENDIX 11

NOISE IMPACT ANALYSIS



Gateway South Building 4

NOISE IMPACT ANALYSIS CITY OF SAN BERNARDINO

PREPARED BY:

Bill Lawson, PE, INCE blawson@urbanxroads.com (949) 336-5979

Alex Wolfe awolfe@urbanxroads.com (949) 336-5977

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10189-13 Noise Study



TABLE OF CONTENTS

TA	BLE O	F CONTENTS	
		CES	
		XHIBITS	
	-	ABLES	
LIS	ST OF A	ABBREVIATED TERMS	VII
			_
EX		VE SUMMARY	
	Off-Si	te Traffic Noise Analysis	1
	•	ational Noise Analysis	
		ruction Noise and Vibration Analysis	
	Signifi	icance Findings	4
1	INT	RODUCTION	5
	1.1	Site Location	5
	1.2	Project Description	5
2	FUI	NDAMENTALS	11
	2.1	Range of Noise	11
	2.2	Noise Descriptors	
	2.3	Sound Propagation	12
	2.4	Noise Control	13
	2.5	Noise Barrier Attenuation	13
	2.6	Land Use Compatibility With Noise	14
	2.7	Community Response to Noise	14
	2.8	Exposure to High Noise Levels	
	2.10	Vibration	15
3	REG	GULATORY SETTING	19
	3.1	State of California Noise Requirements	19
	3.2	State of California Green Building Standards Code	
	3.3	City of San Bernardino General Plan Noise Element	
	3.4	Operational Noise Standards	23
	3.5	Construction Noise Standards	23
	3.6	Vibration Standards	
	3.7	San Bernardino International Airport Noise Standards	26
4	SIG		29
	4.1	Noise-Sensitive Receivers	29
	4.2	Non-Noise-Sensitive Receivers	
	4.3	Significance Criteria Summary	31
5	EXI	STING NOISE LEVEL MEASUREMENTS	33
	5.1	Measurement Procedure and Criteria	33
	5.2	Noise Measurement Locations	33
	5.3	Noise Measurement Results	34



6	ME	ETHODS AND PROCEDURES	39
	6.1	FHWA Traffic Noise Prediction Model	
	6.2	Off-Site Traffic Noise Prediction Model Inputs	
	6.3	Vibration Assessment	44
7	OF	F-SITE TRANSPORTATION NOISE IMPACTS	47
	7.1	Traffic Noise Contours	47
	7.2	Existing Condition Project Traffic Noise Level Contributions	
	7.3	Existing plus Ambient (EA) 2018 Project Traffic Noise Level Contributions	53
	7.4	EA plus Cumulative (EAC) 2018 Project Traffic Noise Level Contributions	
	7.5	Horizon Year 2040 Project Traffic Noise Level Contributions	
	7.6	Off-Site Traffic Noise Mitigation	56
8	RE	CEIVER LOCATIONS	59
9	OP	ERATIONAL NOISE IMPACTS	63
	9.1	Operational Noise Standards	63
	9.2	Operational Noise Sources	63
	9.3	Reference Noise Levels	
	9.4	Project Operational Noise Levels	
	9.5	Project Operational Noise Contribution	
	9.6	Operational Noise Abatement Measures	
	9.7	Operational Vibration Impacts	70
10	СО	NSTRUCTION IMPACTS	71
	10.1	Construction Noise Standards	
	10.2	Construction Noise Levels	
	10.3	Construction Reference Noise Levels	
	10.4	Construction Noise Analysis	
	10.5	Construction Noise Thresholds of Significance	
	10.6	Construction Noise Abatement Measures	
	10.7	Construction Vibration Impacts	
11		FERENCES	
12	CEI	RTIFICATION	85

APPENDICES

- APPENDIX 3.1: CITY OF SAN BERNARDINO DEVELOPMENT CODE
- APPENDIX 3.2: CITY OF SAN BERNARDINO MUNICIPAL CODE
- APPENDIX 5.1: STUDY AREA PHOTOS
- APPENDIX 5.2: NOISE LEVEL MEASUREMENT WORKSHEETS
- APPENDIX 7.1: OFF-SITE TRAFFIC NOISE CONTOURS
- APPENDIX 9.1: REFERENCE DISTRIBUTION/WAREHOUSE NOISE SOURCE PHOTOS
- APPENDIX 9.2: OPERATIONAL STATIONARY-SOURCE NOISE CALCULATIONS

LIST OF EXHIBITS

EXHIBIT 1-A: LOCATION MAP	7
EXHIBIT 1-B: SITE PLAN	8
EXHIBIT 1-C: SITE ACCESS ALTERNATIVES	9
EXHIBIT 2-A: TYPICAL NOISE LEVELS	11
EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION	15
EXHIBIT 2-C: TYPICAL LEVELS OF GROUND-BORNE VIBRATION	17
EXHIBIT 3-A: LAND USE COMPATIBILITY FOR COMMUNITY NOISE EXPOSURE	21
EXHIBIT 3-B: INTERIOR AND EXTERIOR NOISE STANDARDS	22
EXHIBIT 3-C: SAN BERNARDINO INTERNATIONAL AIRPORT NOISE LEVEL CONTOUR BOUND	ARIES 27
EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS	36
EXHIBIT 8-A: RECEIVER LOCATIONS	61
EXHIBIT 9-A: OPERATIONAL NOISE SOURCE LOCATIONS	67
EXHIBIT 10-A: CONSTRUCTION NOISE SOURCE AND RECEIVER LOCATIONS	73

LIST OF TABLES

TABLE ES-1: SUMMARY OF SIGNIFICANCE FINDINGS	4
TABLE 3-1: OPERATIONAL NOISE STANDARDS	23
TABLE 3-2: CONSTRUCTION NOISE STANDARDS	
TABLE 3-3: CONSTRUCTION VIBRATION STANDARDS	
TABLE 4-1: SIGNIFICANCE OF NOISE IMPACTS AT NOISE-SENSITIVE RECEIVERS	30
TABLE 4-2: SIGNIFICANCE CRITERIA SUMMARY	
TABLE 5-1: 24-HOUR AMBIENT NOISE LEVEL MEASUREMENTS	37
TABLE 6-1: OFF-SITE ROADWAY PARAMETERS	40
TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES (1 OF 2)	
TABLE 6-3: AVERAGE DAILY TRAFFIC VOLUMES (2 OF 2)	
TABLE 6-4: TIME OF DAY VEHICLE SPLITS	
TABLE 6-5: WITHOUT PROJECT CONDITIONS VEHICLE MIX	42
TABLE 6-6: EXISTING WITH PROJECT CONDITIONS VEHICLE MIX	
TABLE 6-7: EA 2018 WITH PROJECT CONDITIONS VEHICLE MIX	
TABLE 6-8: EAC 2018 WITH PROJECT CONDITIONS VEHICLE MIX	
TABLE 6-9: HORIZON YEAR 2040 WITH PROJECT CONDITIONS VEHICLE MIX	
TABLE 6-10: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT	
TABLE 7-1: EXISTING WITHOUT PROJECT CONDITIONS NOISE CONTOURS	
TABLE 7-2: EXISTING WITH PROJECT CONDITIONS NOISE CONTOURS	
TABLE 7-3: EA 2018 WITHOUT PROJECT CONDITIONS NOISE CONTOURS	
TABLE 7-4: EA 2018 WITH PROJECT CONDITIONS NOISE CONTOURS	
TABLE 7-5: EAC 2018 WITHOUT PROJECT CONDITIONS NOISE CONTOURS	
TABLE 7-6: EAC 2018 WITH PROJECT CONDITIONS NOISE CONTOURS	
TABLE 7-7: HORIZON YEAR 2040 WITHOUT PROJECT CONDITIONS NOISE CONTOURS	
TABLE 7-8: HORIZON YEAR 2040 WITH PROJECT CONDITIONS NOISE CONTOURS	
TABLE 7-9: EXISTING CONDITION OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACTS	
TABLE 7-10: EA 2018 OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACTS	
TABLE 7-11: EAC 2018 OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACTS	55



TABLE 7-12: HORIZON YEAR 2040 OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACTS	56
TABLE 9-1: REFERENCE NOISE LEVEL MEASUREMENTS	65
TABLE 9-2: PROJECT OPERATIONAL NOISE LEVEL PROJECTIONS	66
TABLE 9-3: PROJECT OPERATIONAL NOISE LEVEL COMPLIANCE	66
TABLE 9-4: PROJECT DAYTIME NOISE LEVEL CONTRIBUTIONS	68
TABLE 9-5: PROJECT NIGHTTIME NOISE LEVEL CONTRIBUTIONS	69
TABLE 10-1: CONSTRUCTION REFERENCE NOISE LEVELS	74
TABLE 10-2: SITE PREPARATION EQUIPMENT NOISE LEVELS	75
TABLE 10-3: GRADING EQUIPMENT NOISE LEVELS	
TABLE 10-4: BUILDING CONSTRUCTION EQUIPMENT NOISE LEVELS	77
TABLE 10-5: PAVING EQUIPMENT NOISE LEVELS	78
TABLE 10-6: ARCHITECTURAL COATING EQUIPMENT NOISE LEVELS	79
TABLE 10-7: UNMITIGATED CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY (DBA LEQ)	80
TABLE 10-8: CONSTRUCTION EQUIPMENT NOISE LEVEL COMPLIANCE (DBA LEQ)	80
TABLE 10-9: CONSTRUCTION EQUIPMENT VIBRATION LEVELS	82



LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
ANSI	American National Standards Institute
Calveno	California Vehicle Noise
CEQA	California Environmental Quality Act
CHE	Cargo Handling Equipment
CNEL	Community Noise Equivalent Level
dBA	A-weighted decibels
EA	Existing plus Ambient
EAC	Existing plus Ambient plus Cumulative
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
Hz	Hertz
I-215	Interstate 215
I-10	Interstate 10
INCE	Institute of Noise Control Engineering
Leq	Equivalent continuous (average) sound level
Lmax	Maximum level measured over the time interval
Lmin	Minimum level measured over the time interval
mph	Miles per hour
OPR	Office of Planning and Research
PPV	Peak particle velocity
Project	Gateway South Building 4
RCNM	Roadway Construction Noise Model
REMEL	Reference Energy Mean Emission Level
RMS	Root-mean-square
SBIA	San Bernardino International Airport
sf	Square feet
VdB	Vibration Decibels

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EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to determine the noise exposure and the necessary noise mitigation measures for the proposed Gateway South Building 4 development ("Project"). The Project site is located south of Dumas Street and west of Waterman Avenue in the City of San Bernardino. The Project is proposed to consist of a total of 1,063,853 square feet (sf) of high-cube warehouse/distribution center use (as a conservative measure, the analysis herein evaluates 1,064,880 sf of high-cube warehouse/distribution center use). This study has been prepared to satisfy the City of San Bernardino noise standards and to ensure that adequate noise abatement measures are incorporated into the Project's development.

OFF-SITE TRAFFIC NOISE ANALYSIS

Traffic generated by the operation of the proposed Project will influence the traffic noise levels in surrounding off-site areas. To quantify the off-site traffic noise increases on the surrounding off-site areas, the changes in traffic noise levels on 11 roadway segments surrounding the Project site were calculated based on the change in the average daily traffic (ADT) volumes. The traffic noise levels provided in this analysis are based on the traffic forecasts found in the *Gateway* South Building 4 Traffic Impact Analysis prepared by Urban Crossroads, Inc. (1) To assess the offsite noise level impacts associated with the proposed Project, noise contour boundaries were developed for Existing, Existing plus Ambient (EA) 2018, EA plus Cumulative (EAC) 2018, and Horizon Year 2040 traffic conditions. The analysis shows that the Project-related traffic noise level increases under all traffic scenarios will be *potentially significant* on one roadway segment: Washington Avenue south of Orange Show Road, which will exceed the significance thresholds for both noise-sensitive and non-noise-sensitive land uses identified in Section 4. This roadway segment will include both an interim roadway improvement area under Existing and Year 2018 conditions, and two permanent access alternatives for site access under Horizon Year 2040 conditions. However, the off-site Project-related traffic noise level increase on Washington Avenue south of Orange Show Road is considered a *significant* impact under all three site access route alternatives.

The land use adjacent to Washington Avenue south of Orange Show road is designated as Industrial Light use by the City of San Bernardino General Plan Land Use Element, and the existing residential homes immediately south of Project access on Washington Avenue represent nonconforming use. However, the Project-related traffic noise level increase due to the addition of Project truck trips on this roadway segment represents a *significant* noise level impact for both noise-sensitive and non-noise-sensitive uses, and therefore, noise mitigation measures are considered in this analysis to reduce the noise levels generated by Project truck trips.

The mitigation measures considered in this analysis include the use of rubberized asphalt hot mix pavement for the portion of Project access road on Washington Avenue south of Orange Show Road, and off-site noise barriers adjacent to the existing non-conforming residential lots south of Project access on Washington Avenue. However, neither form of potential noise mitigation would eliminate or *substantially* (12 dBA Leq or more per Caltrans *Traffic Noise Analysis Protocol* (2)) reduce the off-site traffic noise level increases associated with Project truck trips on



Washington Avenue south of Orange Show Road. Therefore, the Project-related traffic noise level increases are considered *significant* impacts, and no off-site traffic noise mitigation is identified, since the off-site traffic noise mitigation measures considered in this analysis would not substantially reduce or eliminate the impacts.

This off-site traffic noise analysis evaluated 11 study area roadway segments based on the without and with Project traffic noise levels. As indicated above, only one segment of the 11, Washington Avenue south of Orange Show Road, will experience a *significant* off-site traffic noise level impact under with Project conditions. Further, the noise-sensitive residential homes on the impacted roadway segment represent existing non-conforming uses which are designated as Industrial Light land use, and are expected, under long range General Plan buildout conditions, to be redeveloped as industrial, non-noise sensitive land use.

OPERATIONAL NOISE ANALYSIS

Using reference noise levels to represent the expected noise sources from the Gateway South Building 4 site, this analysis estimates the Project-related stationary-source noise levels at nearby sensitive receiver locations. The normal activities associated with the proposed Gateway South Building 4 are anticipated to include idling trucks, delivery truck activities, parking, backup alarms, as well as loading and unloading of dry goods. The operational noise analysis shows that the Project-related stationary-source noise levels due to the idling trucks, delivery truck activities, parking, backup alarms, as well as loading and unloading of dry goods will satisfy the City of San Bernardino noise level standards at the sensitive receiver locations near the Project site.

Further, this analysis demonstrates that the Project will not contribute an operational noise level impact to the existing ambient noise environment at any of the sensitive receiver locations. Therefore, the operational noise level impacts associated with the proposed 24-hour seven days per week Project activities, such as the idling trucks, delivery truck activities, parking, backup alarms, as well as loading and unloading of dry goods, will be *less than significant*.

OPERATIONAL NOISE ABATEMENT MEASURES

To further reduce potential operational noise levels received at nearby noise-sensitive receiver locations, it is recommended that the Lead Agency require the following as Project Conditions of Approval:

- All on-site operating equipment under the control of the building user that is used in outdoor areas shall be equipped with properly functioning and well-maintained mufflers.
- Maintain quality pavement conditions on the property that are free of vertical deflection (i.e. speed bumps) to minimize truck noise.
- The truck access gates and loading docks within the truck court on the Project site shall be posted with signs which state:
 - Truck drivers shall turn off engines when not in use;
 - Diesel trucks servicing the Project shall not idle for more than five (5) minutes; and
 - Post telephone numbers of the building facilities manager to report idling violations.



CONSTRUCTION NOISE AND VIBRATION ANALYSIS

Construction noise represents a short-term impact on the ambient noise levels. Based on the five phases of Project construction, the temporary construction-related noise impacts are expected to create temporary and intermittent high-level noise at receivers surrounding the Project site when certain activities occur near the property line. While the City of San Bernardino establishes limits to the hours during which construction activity may take place, it does not identify specific noise level limits for construction noise levels. Therefore, this analysis uses an 85 dBA Leq threshold identified by the National Institute for Occupational Safety and Health (NIOSH) to quantify and determine potential construction noise level impacts. The analysis shows that the Project-related short-term construction noise levels will approach 75.4 dBA Leq and will satisfy the 85 dBA Leq threshold identified by the National Institute for Occupational Safety and Health (NIOSH). (3)

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. It is expected that ground-borne vibration from Project construction activities would cause only intermittent, localized intrusion. This analysis shows the construction vibration levels in RMS are expected to approach 0.011 in/sec (RMS) at the nearby receiver locations. Based on the City of San Bernardino vibration standards of 0.7 in/sec (RMS), the proposed Project construction activities will be *less than significant*.

CONSTRUCTION NOISE AND VIBRATION ABATEMENT MEASURES

Construction noise is temporary, intermittent and of short duration, and will not present any long-term impacts. The following practices would reduce any temporary and intermittent noise level increases produced by the construction equipment at the nearby noise-sensitive residential land uses, consistent with City of San Bernardino General Plan Policies 14.3.2.1 and 14.3.2. (4) Prior to approval of grading plans and/or issuance of building permits, plans shall include the following notes. The Project construction supervisor shall ensure compliance with the notes and the City shall conduct periodic inspection at its discretion.

- Noise-generating Project construction activities shall only occur between the hours of 7:00 a.m. and 8:00 p.m. on any day, as specified in the City of San Bernardino Noise Ordinance. (5)
- The construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards.
- No stationary construction equipment shall be placed within 500 feet of residential homes and other noise-sensitive receivers. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise-sensitive receivers nearest the Project site.
- The construction contractor shall locate equipment staging in the western portion of the property, near the proposed western building façade, which is the area that will create the greatest distance between construction-related noise sources and noise-sensitive receivers nearest the Project site.
- The construction contractor shall schedule haul truck deliveries to occur during the same hours specified for construction equipment (between the hours of 7:00 a.m. and 8:00 p.m. on any day)



and design haul truck delivery routes to minimize the use of roads that pass by noise-sensitive land uses.

SIGNIFICANCE FINDINGS

The results of this Gateway South Building 4 Noise Impact Analysis are summarized below based on the significance criteria in Section 4 of this report. Table ES-1 shows the findings of significance for each potential noise and/or vibration impact before and after any required mitigation measures.

Anghais	Report	Significance Findings			
Analysis	Section	Unmitigated	Mitigated		
Off-Site Traffic Noise	7	Potentially Significant	Significant ¹		
Operational Noise		Less Than Significant	n/a		
Operational Vibration	9	Less Than Significant	n/a		
Construction Noise	10	Less Than Significant	n/a		
Construction Vibration	10	Less Than Significant	n/a		

TABLE ES-1: SUMMARY OF SIGNIFICANCE FINDINGS

¹ Significant impact occurs at adjacent land use to one roadway segment, Washington Avenue south of Orange Show Road. The existing residential land use is non-conforming use based on the General Plan designation for industrial use at this location. Mitigation measures are considered in this noise study to reduce the impacts at adjacent uses, but the impact remains significant since they cannot substantially reduce or eliminate the noise impact.

"n/a" = No mitigation is required.



1 INTRODUCTION

This noise analysis has been completed to determine the noise impacts associated with the development of the proposed Gateway South Building 4 ("Project"). This noise study briefly describes the proposed Project, provides information regarding noise fundamentals, describes the local regulatory setting, provides the study methods and procedures for traffic noise analysis, and evaluates the future exterior noise environment. In addition, this study includes an analysis of the potential Project-related long-term operational and short-term construction noise impacts.

1.1 SITE LOCATION

The proposed Gateway South Building 4 site is located south of Dumas Street and west of Waterman Avenue in the City of San Bernardino, as shown on Exhibit 1-A. The Project site is bordered by the San Bernardino County Flood Control Channel to the west, and a future industrial warehouse building to the north, various office and industrial land uses to the east, and the Santa Ana River to the south. The Interstate 215 (I-215) and I-10 Freeways are located roughly one-half mile to the west and south, respectively.

1.2 PROJECT DESCRIPTION

The Project is proposed to consist of a total of 1,063,853 square feet (sf) of high-cube warehouse/distribution center use (as a conservative measure, the analysis herein evaluates 1,064,880 sf of high-cube warehouse/distribution center use), as shown on Exhibit 1-B. The Project site is currently occupied by the San Bernardino Public Golf Course. Existing structures on-site totaling approximately 17,575 square feet (sf) will be demolished prior to building construction. For the purposes of this traffic study, the Project anticipated to be developed in a single phase with an anticipated opening year of 2018.

At the time this noise analysis was prepared the future tenants of the proposed Project were unknown. To present the potential worst-case noise conditions, this analysis assumes the Project would be operational 24 hours per day, seven days per week. The Project business operations would primarily be conducted within the enclosed buildings, except for traffic movement, parking, as well as loading and unloading of trucks at designated loading bays. The on-site Project-related noise sources are expected to include: idling trucks, delivery truck activities, parking, backup alarms, as well as loading and unloading of dry goods. This noise analysis is intended to describe noise level impacts associated with the expected typical warehouse and distribution storage activities at the Project site. As part of the Project's design, all on-site outdoor cargo handling equipment (CHE) (including yard trucks, hostlers, yard goats, pallet jacks, forklifts, and other on-site equipment) will be powered by non-diesel fueled engines and all onsite indoor forklifts shall be powered by electricity, compressed natural gas, or propane. According to the *Gateway South Building 4 Traffic Impact Analysis* prepared by Urban Crossroads, Inc., the Project is expected to generate a net total of approximately 1,789 trip-ends per day (actual vehicles) with 117 AM peak hour trips and 127 PM peak hour trips. (1) The net Project trip generation includes 682 truck trip-ends per day from the proposed buildings within the Project site. This noise study relies on the net Project trips to accurately account for the effect of individual truck trips on the study area roadway network.

Access to the northern portion of the Project site from Washington Avenue south of Orange Show Road will include both an interim roadway improvement area under Existing and Year 2018 conditions, and two permanent access alternatives for site access under Horizon Year 2040 conditions, as shown on Exhibit 1-C.



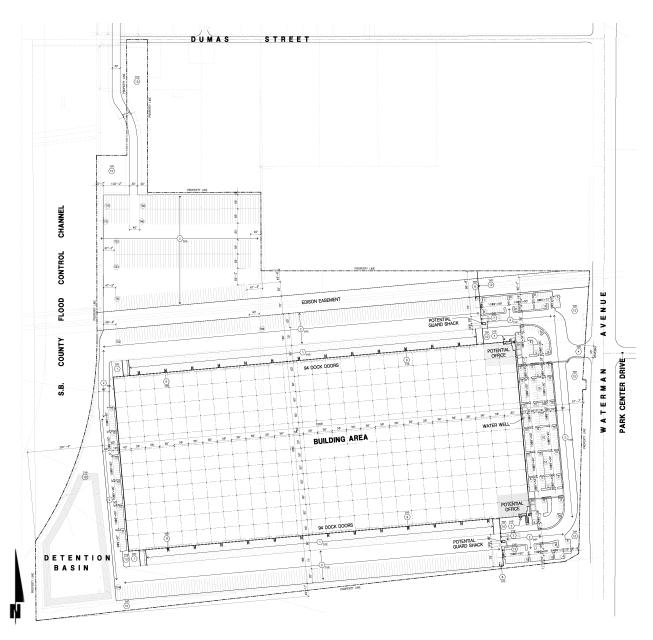


EXHIBIT 1-A: LOCATION MAP

7

URBAN CROSSROADS

EXHIBIT 1-B: SITE PLAN





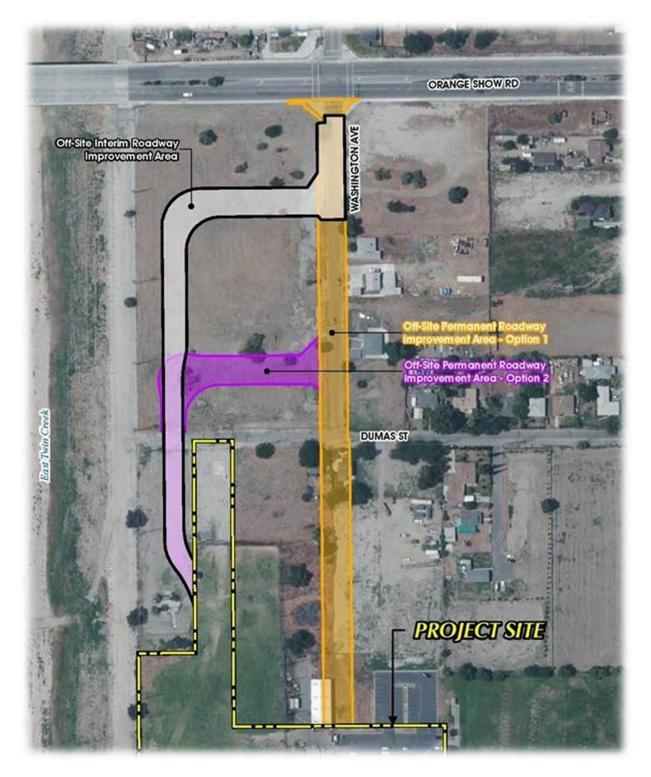


EXHIBIT 1-C: SITE ACCESS ALTERNATIVES



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2 FUNDAMENTALS

Noise has been simply defined as "unwanted sound." Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. Noise is measured on a logarithmic scale of sound pressure level known as a decibel (dB). A-weighted decibels (dBA) approximate the subjective response of the human ear to broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies which are audible to the human ear. Exhibit 2-A presents a summary of the typical noise levels and their subjective loudness and effects that are described in more detail below.

COMMON OUTDOOR ACTIVITIES	COMMON INDOOR ACTIVITIES	A - WEIGHTED SOUND LEVEL dBA	SUBJECTIVE LOUDNESS	EFFECTS OF NOISE	
THRESHOLD OF PAIN		140			
NEAR JET ENGINE		130	INTOLERABLE OR		
		120	DEAFENING	HEARING LOSS	
JET FLY-OVER AT 300m (1000 ft)	ROCK BAND	110			
LOUD AUTO HORN		100			
GAS LAWN MOWER AT 1m (3 ft)		90			
DIESEL TRUCK AT 15m (50 ft), at 80 km/hr (50 mph)	FOOD BLENDER AT 1m (3 ft)	80			
NOISY URBAN AREA, DAYTIME	VACUUM CLEANER AT 3m (10 ft)	70	LOUD	SPEECH INTERFERENCE	
HEAVY TRAFFIC AT 90m (300 ft)	NORMAL SPEECH AT 1m (3 ft)	60			
QUIET URBAN DAYTIME	LARGE BUSINESS OFFICE	50	MODERATE	SLEEP	
QUIET URBAN NIGHTTIME	THEATER, LARGE CONFERENCE ROOM (BACKGROUND)	40		DISTURBANCE	
QUIET SUBURBAN NIGHTTIME	LIBRARY	30			
QUIET RURAL NIGHTTIME	BEDROOM AT NIGHT, CONCERT HALL (BACKGROUND)	20	FAINT		
	BROADCAST/RECORDING STUDIO	10		NO EFFECT	
LOWEST THRESHOLD OF HUMAN HEARING	LOWEST THRESHOLD OF HUMAN HEARING	0	VENT FAINT		

EXHIBIT 2-A: TYPICAL NOISE LEVELS

Source: Environmental Protection Agency Office of Noise Abatement and Control, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (EPA/ONAC 550/9-74-004) March 1974.

2.1 RANGE OF NOISE

Since the range of intensities that the human ear can detect is so large, the scale frequently used to measure intensity is a scale based on multiples of 10, the logarithmic scale. The scale for measuring intensity is the decibel scale. Each interval of 10 decibels indicates a sound energy ten times greater than before, which is perceived by the human ear as being roughly twice as loud. (6) The most common sounds vary between 40 dBA (very quiet) to 100 dBA (very loud). Normal conversation at three feet is roughly at 60 dBA, while loud jet engine noises equate to 110 dBA



at approximately 100 feet, which can cause serious discomfort. (7) Another important aspect of noise is the duration of the sound and the way it is described and distributed in time.

2.2 NOISE DESCRIPTORS

Environmental noise descriptors are generally based on averages, rather than instantaneous, noise levels. The most commonly used figure is the equivalent level (Leq). Equivalent sound levels are not measured directly but are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level (Leq) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period and is commonly used to describe the "average" noise levels within the environment.

Peak hour or average noise levels, while useful, do not completely describe a given noise environment. Noise levels lower than peak hour may be disturbing if they occur during times when quiet is most desirable, namely evening and nighttime (sleeping) hours. To account for this, the Day-Night Average Noise Level (LDN) and the Community Noise Equivalent Level (CNEL), representing a composite 24-hour noise level is utilized. The LDN and CNEL are weighted averages of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The LDN time of day corrections include the addition of 10 decibels to dBA Leg sound levels at night between 10:00 p.m. and 7:00 a.m. The CNEL time of day corrections require the addition of 5 decibels to dBA Leq sound levels in the evening from 7:00 p.m. to 10:00 p.m., in addition to the corrections for the LDN. These additions are made to account for the noise sensitive time periods during the evening and night hours when sound appears louder. LDN and CNEL do not represent the actual sound level heard at any particular time, but rather represent the total sound exposure. The City of San Bernardino relies on the 24-hour CNEL level to assess land use compatibility with transportation related noise sources, and therefore, this analysis uses the CNEL noise level to apply the more conservative evening hour corrections to the 24-hour noise levels.

2.3 SOUND PROPAGATION

When sound propagates over a distance, it changes in level and frequency content. The way noise reduces with distance depends on the following factors.

2.3.1 GEOMETRIC SPREADING

Sound from a localized source (i.e., a stationary point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a line source.



2.3.2 GROUND ABSORPTION

The propagation path of noise from a highway to a receptor is usually very close to the ground. Noise attenuation from ground absorption and reflective wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually sufficiently accurate for distances of less than 200 ft. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receptor, such as a parking lot or body of water), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receptor such as soft dirt, grass, or scattered bushes and trees), an excess ground attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance from a line source.

2.3.3 ATMOSPHERIC EFFECTS

Receptors located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also increase noise levels.

2.3.4 SHIELDING

A large object or barrier in the path between a noise source and a receptor can substantially attenuate noise levels at the receptor. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Shielding by trees and other such vegetation typically only has an "out of sight, out of mind" effect. That is, the perception of noise impact tends to decrease when vegetation blocks the line-of-sight to nearby resident. However, for vegetation to provide a substantial, or even noticeable, noise reduction, the vegetation area must be at least 15 feet in height, 100 feet wide and dense enough to completely obstruct the line-of sight between the source and the receiver. This size of vegetation may provide up to 5 dBA of noise reduction. The FHWA does not consider the planting of vegetation to be a noise abatement measure.

2.4 NOISE CONTROL

Noise control is the process of obtaining an acceptable noise environment for an observation point or receptor by controlling the noise source, transmission path, receptor, or all three. This concept is known as the source-path-receptor concept. In general, noise control measures can be applied to these three elements.

2.5 Noise Barrier Attenuation

Effective noise barriers can reduce noise levels by 10 to 15 dBA, cutting the loudness of traffic noise in half. A noise barrier is most effective when placed close to the noise source or receptor.



Noise barriers, however, do have limitations. For a noise barrier to work, it must be high enough and long enough to block the path of the noise source. (8)

2.6 LAND USE COMPATIBILITY WITH NOISE

Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches and residences are more sensitive to noise intrusion than are commercial or industrial developments and related activities. As ambient noise levels affect the perceived amenity or livability of a development, so too can the mismanagement of noise impacts impair the economic health and growth potential of a community by reducing the area's desirability as a place to live, shop and work. For this reason, land use compatibility with the noise environment is an important consideration in the planning and design process. The FHWA encourages State and Local government to regulate land development in such a way that noise-sensitive land uses are either prohibited from being located adjacent to a highway, or that the developments are planned, designed, and constructed in such a way that noise impacts are minimized. (9)

2.7 COMMUNITY RESPONSE TO NOISE

Community responses to noise may range from registering a complaint by telephone or letter, to initiating court action, depending upon each individual's susceptibility to noise and personal attitudes about noise. Several factors are related to the level of community annoyance including:

- Fear associated with noise producing activities;
- Socio-economic status and educational level;
- Perception that those affected are being unfairly treated;
- Attitudes regarding the usefulness of the noise-producing activity;
- Belief that the noise source can be controlled.

Approximately ten percent of the population has a very low tolerance for noise and will object to any noise not of their making. Consequently, even in the quietest environment, some complaints will occur. Another twenty-five percent of the population will not complain even in very severe noise environments. Thus, a variety of reactions can be expected from people exposed to any given noise environment. (10) Surveys have shown that about ten percent of the people exposed to traffic noise of 60 dBA will report being highly annoyed with the noise, and each increase of one dBA is associated with approximately two percent more people being highly annoyed. When traffic noise exceeds 60 dBA or aircraft noise exceeds 55 dBA, people may begin to complain. (10)

Despite this variability in behavior on an individual level, the population can be expected to exhibit the following responses to changes in noise levels as shown on Exhibit 2-B. An increase or decrease of 1 dBA cannot be perceived except in carefully controlled laboratory experiments, a change of 3 dBA are considered *barely perceptible*, and changes of 5 dBA are considered *readily perceptible*. (8)



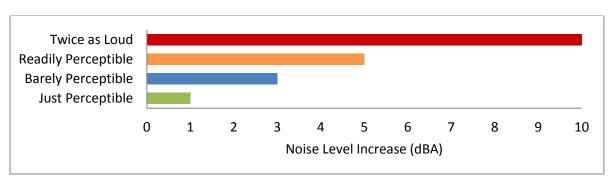


EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION

2.8 EXPOSURE TO HIGH NOISE LEVELS

The Occupational Safety and Health Administration (OSHA) sets legal limits on noise exposure in the workplace. The permissible exposure limit (PEL) for a worker over an eight-hour day is 90 dBA. The OSHA standard uses a 5 dBA exchange rate. This means that when the noise level is increased by 5 dBA, the amount of time a person can be exposed to a certain noise level to receive the same dose is cut in half. The National Institute for Occupational Safety and Health (NIOSH) has recommended that all worker exposures to noise should be controlled below a level equivalent to 85 dBA for eight hours to minimize occupational noise induced hearing loss. NIOSH also recommends a 3 dBA exchange rate so that every increase by 3 dBA doubles the amount of the noise and halves the recommended amount of exposure time. (11)

OSHA has implemented requirements to protect all workers in general industry (e.g. the manufacturing and the service sectors) for employers to implement a Hearing Conservation Program where workers are exposed to a time weighted average noise level of 85 dBA or higher over an eight-hour work shift. Hearing Conservation Programs require employers to measure noise levels, provide free annual hearing exams and free hearing protection, provide training, and conduct evaluations of the adequacy of the hearing protectors in use unless changes to tools, equipment and schedules are made so that they are less noisy and worker exposure to noise is less than the 85 dBA. This noise study does not evaluate the noise exposure of workers within a project or construction site based on CEQA requirements, and instead, evaluates Project-related operational and construction noise levels at the nearby sensitive receiver locations in the Project study area. Further, periodic exposure to high noise levels in short duration, such as Project construction, is typically considered an annoyance and not impactful to human health. It would take several years of exposure to high noise levels to result in hearing impairment. (12)

2.9 VIBRATION

According to the Federal Transit Administration (FTA) *Transit Noise Impact and Vibration Assessment* (13), vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called structure-borne noise. Sources of groundborne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, such as factory machinery, or transient, such



as explosions. As is the case with airborne sound, ground-borne vibrations may be described by amplitude and frequency.

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings, but is not always suitable for evaluating human response (annoyance) because it takes some time for the human body to respond to vibration signals. Instead, the human body responds to average vibration amplitude often described as the root mean square (RMS). The RMS amplitude is defined as the average of the squared amplitude of the signal, and is most frequently used to describe the effect of vibration on the human body. Decibel notation (VdB) is commonly used to measure RMS. Decibel notation. Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receivers for vibration include structures (especially older masonry structures), people (especially residents, the elderly, and sick), and vibration-sensitive equipment.

The background vibration-velocity level in residential areas is generally 50 VdB. Ground-borne vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground-borne vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Exhibit 2-C illustrates common vibration sources and the human and structural response to ground-borne vibration.

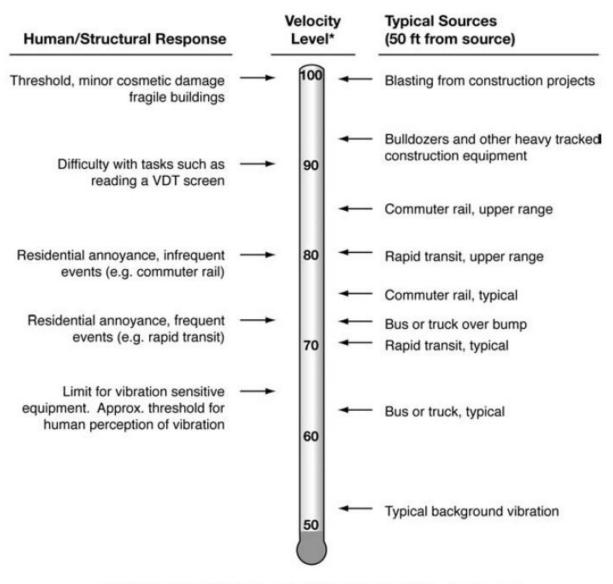


EXHIBIT 2-C: TYPICAL LEVELS OF GROUND-BORNE VIBRATION

* RMS Vibration Velocity Level in VdB relative to 10⁻⁶ inches/second

Source: Federal Transit Administration (FTA) Transit Noise Impact and Vibration Assessment.



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3 REGULATORY SETTING

To limit population exposure to physically and/or psychologically damaging as well as intrusive noise levels, the federal government, the State of California, various county governments, and most municipalities in the state have established standards and ordinances to control noise. In most areas, automobile and truck traffic is the major source of environmental noise. Traffic activity generally produces an average sound level that remains fairly constant with time. Air and rail traffic, and commercial and industrial activities are also major sources of noise in some areas. Federal, state, and local agencies regulate different aspects of environmental noise. Federal and state agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while regulation of stationary sources is left to local agencies.

3.1 STATE OF CALIFORNIA NOISE REQUIREMENTS

The State of California regulates freeway noise, sets standards for sound transmission, provides occupational noise control criteria, identifies noise standards, and provides guidance for local land use compatibility. State law requires that each county and city adopt a General Plan that includes a Noise Element which is to be prepared according to guidelines adopted by the Governor's Office of Planning and Research (OPR). (14) The purpose of the Noise Element is to *limit the exposure of the community to excessive noise levels*.

3.2 STATE OF CALIFORNIA GREEN BUILDING STANDARDS CODE

The 2014 State of California's Green Building Standards Code contains mandatory measures for non-residential building construction in Section 5.507 on Environmental Comfort. (15) These noise standards are applied to new construction in California for controlling interior noise levels resulting from exterior noise sources. The regulations specify that acoustical studies must be prepared when non-residential structures are developed in areas where the exterior noise levels exceed 65 dBA CNEL, such as within a noise contour of an airport, freeway, railroad, and other areas where noise contours are not readily available. If the development falls within an airport or freeway 65 dBA CNEL noise contour, the combined sound transmission class (STC) rating of the wall and roof-ceiling assemblies must be at least 50. For those developments in areas where noise contours are not readily available and the noise level exceeds 65 dBA Leq for any hour of operation, a wall and roof-ceiling combined STC rating of 45, and exterior windows with a minimum STC rating of 40 are required (Section 5.507.4.1).

3.3 CITY OF SAN BERNARDINO GENERAL PLAN NOISE ELEMENT

The City of San Bernardino General Plan Noise Element identifies several policies to minimize the impacts of excessive noise levels throughout the community. (4) The Noise Element provides policy guidance which addresses the generation, mitigation, avoidance, and the control of excessive noise. To protect City of San Bernardino residents from excessive noise levels, the Noise Element contains the following three goals:

14.1 Ensure that residents are protected from excessive noise through careful land planning.



- 14.2 Encourage the reduction of noise from transportation-related noise sources such as motor vehicles, aircraft operations, and railroad movements.
- 14.3 Protect residents from the negative effects of "spill over" or nuisance noise.

The noise policies specified in the City of San Bernardino Noise Element provide the guidelines necessary to satisfy these goals. To ensure that residents are not exposed to excessive noise levels (Goal 14.1), Policies 14.1.1 to 14.1.4 indicate that sensitive land uses such as housing, health care facilities, schools, libraries, and religious facilities should not experience exterior noise levels greater than 65 dBA LDN for exterior areas and 45 dBA LDN for interior areas. As discussed in Section 2.2 the more conservative CNEL descriptor is used in this analysis, and therefore, the exterior noise level criteria of 65 dBA CNEL and interior noise level criteria of 45 dBA CNEL shall apply to sensitive land uses. Policies 14.2.1 to 14.2.19 outline the transportation-related guidelines and mitigation strategies the City uses to satisfy Goal 14.2. To protect residents from sources of operational and construction noise (Goal 14.3), the Noise Element includes Policies 14.3.1 to 14.3.8 to adopt a Noise Ordinance and ensure noise issues between land uses are reduced. (4)

3.3.1 LAND USE COMPATIBILITY

The noise criteria identified in the City of San Bernardino Noise Element (Figure N-1) are guidelines to evaluate the land use compatibility of transportation-related noise. The compatibility criteria, shown on Exhibit 3-A, provides the City with a planning tool to gauge the compatibility of land uses relative to existing and future exterior noise levels. The *Land Use Compatibility for Community Noise Exposure* guidelines indicate that industrial and manufacturing land uses, such as the Project, are considered *normally acceptable* with noise levels below 70 dBA CNEL and *conditionally acceptable* with noise levels of less than 75 dBA CNEL.

3.3.2 TRANSPORTATION NOISE STANDARDS

To encourage the reduction of noise from transportation-related noise sources such as motor vehicles, aircraft operations and railroad movements (Goal 14.2), Table N-3 of the City of San Bernardino General Plan Noise Element, shown on Exhibit 3-B, identifies a maximum allowable exterior noise level of 65 dBA CNEL and an interior noise level limit of 45 dBA CNEL for new residential developments. While the City specifically identifies an exterior noise level limit for noise-sensitive residential land uses such as hotels, hospitals, schools, and parks, the City of San Bernardino does not maintain exterior noise standards for non-noise sensitive land uses such as office, retail, manufacturing, utilities, agriculture, and industrial.



		55	60	65	70	75	80
Residential-Low Density Single Family, Duplex, Mobile	e Homes	-	1			_	
Residential-Multiple Family			1			_	
Transient Lodging-Motels, He	otels				_		
Schools, Libraries, Churches, Nursing Homes	Hospitals,						
Auditoriums, Concert Halls, A	Amphitheaters			-			
Sports Arena, Outdoor Specta	ator Sports	l I	-				
Playgrounds, Neighborhood I	Parks		-				
Golf Courses, Riding Stables, Cemeteries	Water Recreation,		T		-		
Office Buildings, Businesses, and Professional	Commercial,						
Industrial, Manufacturing, U Agriculture	tilities,						
Legend: Normally Acceptable: Specified land use is satisfactory based upon	Conditionally Acceptable: New construction or development should be	No	rmally Unac	cceptable:	generally		Inacceptable: ction or development should
Specirio and use a satisfy obsection of the specific of the sampling in that any buildings involved are of normal conventional construction, without any special noise insulation requirements. Source: California Office of Noise Control	New construction or acveropment should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally	be d doer redu nois	iscouraged. If ne s proceed, a detail action requirement	we construction or d led analysis of the n its must be made wit res included in the c	rvelopment bise h needed	generally not costs to make acceptable w	tion or development should be undertaken. Construction the indoor environment ould be prohibitive and the ronment would not be usable

EXHIBIT 3-A: LAND USE COMPATIBILITY FOR COMMUNITY NOISE EXPOSURE

COMMUNITY NOISE EXPOSURE LEVEL Ldn or CNEL, dBA

Source: City of San Bernardino General Plan Noise Element, Figure N-1.

LAND USE CATEGORY



	CNEL (dBA)		
Categories	Uses	Interior ¹	Exterior ²
Residential	Single and multi-family, duplex	45 ³	65
	Mobile homes		65 ⁴
	Hotel, motel, transient housing	45	
	Commercial retail, bank, restaurant	55	
	Office building, research and	50	
	development, professional offices		
	Amphitheater, concert hall, auditorium,	45	
Commercial	movie theater		
	Gymnasium (Multipurpose)	50	
	Sports Club	55	
	Manufacturing, warehousing, wholesale,	65	
	utilities		
	Movie Theaters	45	
Institutional/	Hospital, school classrooms/playgrounds	45	65
Public	Church, library	45	
Open Space	Parks		65

EXHIBIT 3-B: INTERIOR AND EXTERIOR NOISE STANDARDS

¹ Indoor environment excluding: bathrooms, kitchens, toilets, closets, and corridors

² Outdoor environment limited to:

- Private yard of single-family dwellings
- Multi-family private patios or balconies accessed from within the dwelling (Balconies 6 feet deep or less are exempt)
- Mobile home parks
- Park picnic areas
- School playgrounds
- Hospital patios

³ Noise level requirement with closed windows, mechanical ventilation or other means of natural ventilation shall be provided as per Chapter 12, Section 1205 of the Uniform Building Code.

⁴ Exterior noise levels should be such that interior noise levels will not exceed 45 dBA CNEL.

Source: City of San Bernardino General Plan Noise Element, Table N-3.



3.4 OPERATIONAL NOISE STANDARDS

To analyze noise impacts originating from a designated fixed location or private property such as the Gateway South Building 4 Project, operational source noise is typically evaluated against standards established under a City's Municipal Code. While the City of San Bernardino maintains several policies in the Municipal Code Noise Control Ordinance to control the negative effects of nuisance noise, it does not identify specific exterior noise level limits. However, the policies in the Municipal Code Development Code, Chapter 19.20, *Property Development Standards* contain the exterior and interior noise level standards for residential land uses. Therefore, the stationary noise sources such as idling trucks, delivery truck activities, parking, backup alarms, as well as loading and unloading of dry goods originating from a designated fixed location or private property such as the Gateway South Building 4 site, are evaluated against the policies adopted in the City's Development Code. (5)

The Project operational noise impacts are governed by the City of San Bernardino Municipal Code, Section 8.54, included in Appendix 3.2. Section 8.54.060 states when: *such noises are an accompaniment and effect of a lawful business, commercial or industrial enterprise carried on in an area zoned for that purpose*...these activities shall be exempt (Section 8.54.060(B)). (16) However, due to the Project's close proximity to residential land uses, located north of the Project site boundary, Development Code, Section 19.20.030.15(A), limits the operational stationary-source noise from the Gateway South Building 4 Project to an exterior noise level of 65 dBA Leq for residential land use. (5) The City of San Bernardino Development Code noise standards are shown on Table 3-1 and included in Appendix 3.1.

Jurisdiction	Land Use	Exterior Noise Level Standard (dBA Leq) ¹
City of San Bernardino ¹	Residential	65

TABLE 3-1: OPERATIONAL NOISE STANDARDS

¹ Source: City of San Bernardino Development Code, Section 19.20.030.15(A) (Appendix 3.1).

3.5 CONSTRUCTION NOISE STANDARDS

To analyze noise impacts originating from the construction of the Gateway South Building 4 site, noise from construction activities are typically evaluated against standards established under a City's Municipal Code. The Municipal Code noise standards for construction are described below for the City of San Bernardino to determine the potential noise impacts at nearby receiver locations. The construction-related noise standards are shown on Table 3-2.



3.5.1 CITY OF SAN BERNARDINO MUNICIPAL CODE

The City of San Bernardino has set restrictions to control noise impacts associated with the construction of the proposed Project. Section 8.54.070 of the City's Noise Control Ordinance states: No person shall be engaged or employed, or cause any other person to be engaged or employed, in any work of construction, erection, alteration, repair, addition, movement, demolition, or improvement to any building or structure except within the hours of 7:00 a.m. and 8:00 p.m. (16) While the City establishes limits to the hours during which construction activity may take place, it does not identify specific noise level limits for construction noise levels.

Jurisdiction	Permitted Hours of Construction Activity
City of San Bernardino ¹	7:00 a.m. to 8:00 p.m. on any day.

TABLE 3-2: CONSTRUCTION NOISE STANDARDS

¹ Source: City of San Bernardino Municipal Code, Section 8.54.070 (Appendix 3.2).

3.5.1 CONSTRUCTION NOISE LEVEL THRESHOLD

To evaluate whether the Project will generate a substantial periodic increase in short-term noise levels at off-site sensitive receiver locations, a construction-related noise level threshold is adopted from the Criteria for Recommended Standard: Occupational Noise Exposure prepared by the National Institute for Occupational Safety and Health (NIOSH). (3) A division of the U.S. Department of Health and Human Services, NIOSH identifies a noise level threshold based on the duration of exposure to the source. The construction related noise level threshold starts at 85 dBA for more than eight hours per day, and for every 3 dBA increase, the exposure time is cut in half. This results in noise level thresholds of 88 dBA for more than four hours per day, 92 dBA for more than one hour per day, 96 dBA for more than 30 minutes per day, and up to 100 dBA for more than 15 minutes per day. (3) For the purposes of this analysis, the lowest, more conservative construction noise level threshold of 85 dBA Leg is used as an acceptable threshold for construction noise at the nearby sensitive receiver locations. Since this construction-related noise level threshold represents the energy average of the noise source over a given time period, they are expressed as Leg noise levels. Therefore, the noise level threshold of 85 dBA Leg over a period of eight hours or more is used to evaluate the potential Project-related construction noise level impacts at the nearby sensitive receiver locations.

3.5.2 CONSTRUCTION-RELATED HEARING CONSERVATION

The Occupational Safety and Health Administration (OSHA) requires hearing protection be provided by employers in workplaces where the noise levels may, over long periods of exposure to high noise levels, endanger the hearing of their employees. Standard 29 CFR, Part 1910 indicates the noise levels under which a hearing conservation program is required to be provided



to workers exposed to high noise levels. (11) This analysis does not evaluate the noise exposure of construction workers within the Project site based on CEQA requirements, and instead, evaluates the Project-related construction noise levels at the nearby sensitive receiver locations in the Project study area. Further, periodic exposure to high noise levels in short duration, such as Project construction, is typically considered an annoyance and not impactful to human health. It would take several years of exposure to high noise levels to result in hearing impairment. (12)

3.6 VIBRATION STANDARDS

The City of San Bernardino Development Code, Section 19.20.030.28 indicates: *No vibration associated with any use shall be permitted which is discernible beyond the boundary line of the property*; however, no specific vibration standards are identified. To assess vibration impacts from the Project site, this analysis uses the vibration standards found in Section 15.68.020 of the City of San Bernardino Municipal Code for equipment or machinery. The vibration standards indicate that no displacement of greater than 0.33 of one inch is allowed. To determine the vibration (inches per second) standard based on a displacement of 0.33 inches, the following equation from the *Caltrans Transportation and Construction- Induced Vibration Guidance Manual*:

$V = 2 \pi f (D/2)$

Where "V" is the velocity; "f" is the frequency (in Hertz); and "D" is the displacement of 0.33 inches. The typical frequency range of vibration from transportation and construction sources falls within 10 to 30 Hertz (Hz) and centers around 15 Hz. (17) Therefore, using the typical frequency range of 10 to 30 Hz, the vibration standards shown on Table 3-3 shall apply for the nearby residential receiver locations due to equipment or machinery associated with the construction of the Project.

Construction activity can result in varying degrees of ground-borne vibration, depending on the equipment and methods used, distance to the affected structures and soil type. Construction equipment such as air compressors, light trucks, hydraulic loaders, etc., generates little or no ground vibration. Occasionally large bulldozers and loaded trucks can cause perceptible vibration levels at close proximity. The vibration standards on Table 3-3 provide the basis for determining the relative significance of potential Project related vibration impacts at the nearby sensitive receiver locations.



Jurisdiction	Frequency (Hz) ¹	Displacement (inches) ²	PPV (in/sec) ³	RMS Velocity (in/sec) ⁴
City of San Bernardino	10	0.033	1.0	0.7
	15	0.033	1.6	1.1
	20	0.033	2.1	1.5
	25	0.033	2.6	1.8
	30	0.033	3.1	2.2
Minimum Velocity Threshold:			1.0	0.7

TABLE 3-3: CONSTRUCTION VIBRATION STANDARDS

¹The typical frequency range of vibration from transportation and construction sources based on the Caltrans Transportation and Construction Vibration Guidance Manual, September 2013.

² No displacement of greater than 0.033 of one inch is allowed based on Section 15.68.020 of the City of San Bernardino Municipal Code for equipment or machinery.

³ Calculated Peak Particle Velocity (PPV) based on the basic vibration formula ($V=2\pi f(D/2)$) provided in the Caltrans Transportation and Construction Vibration Guidance Manual, September 2013, where 'f' = frequency and 'D' = displacement.

⁴ Calculated Root-Mean-Square (RMS) velocity based on the 0.71 conversion factor for the PPV as provided in Appendix A of the Caltrans Transportation and Construction Vibration Guidance Manual, September 2013.

3.7 SAN BERNARDINO INTERNATIONAL AIRPORT NOISE STANDARDS

The San Bernardino International Airport (SBIA) is located approximately 1.75 miles northeast of the Project site. The City of San Bernardino General Plan Noise Element policies and noise contours for the SBIA are used in this analysis to determine the potential aircraft-related noise impacts on the Project site.

As shown on Exhibit 3-C, the Project site is located within the 65 to 70 dBA CNEL noise level contour boundary of the SBIA. The City of San Bernardino General Plan Noise Element, Table N-3, indicates that any industrial (manufacturing) building of the Project within the 65 to 70 dBA CNEL noise level contour boundary must satisfy an interior noise level standard of 65 dBA CNEL. (4) However, no Project buildings are located in the portion of the Project site within the 65 to 70 dBA CNEL noise level contour boundary, and no exterior noise level standards are identified for industrial land uses in the City of San Bernardino General Plan Noise Element. Further, as previously shown on Exhibit 3-A, the Project industrial land use is considered *normally acceptable* with exterior noise levels between 65 to 70 dBA CNEL. Therefore, no exterior or interior noise mitigation is required to satisfy the City of San Bernardino General Plan Noise Element policies. Further, standard building construction typically provides up to 25 dBA CNEL of attenuation, which will reduce the interior noise levels within the building at the Project site to satisfy the 65 dBA CNEL interior noise level standard of the City of San Bernardino General Plan Noise Element.



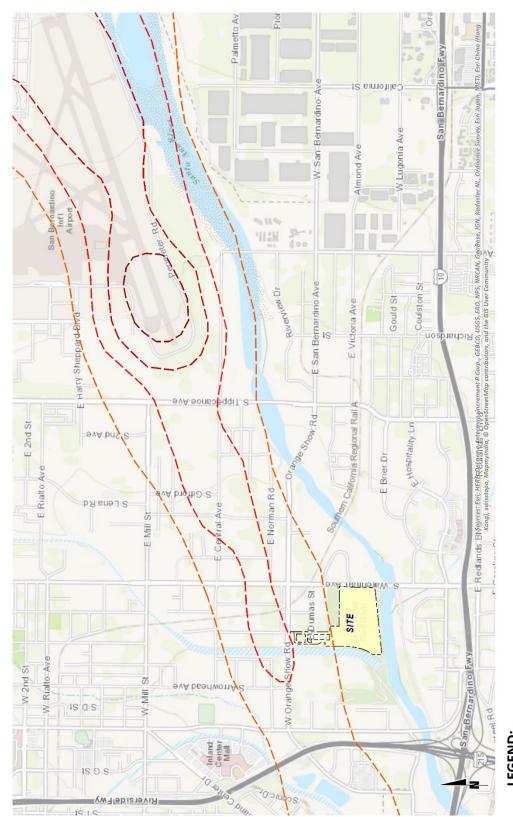


EXHIBIT 3-C: SAN BERNARDINO INTERNATIONAL AIRPORT NOISE LEVEL CONTOUR BOUNDARIES

LEGEND:



10189-13 Noise Study

C URBAN CROSSROADS

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4 SIGNIFICANCE CRITERIA

The following significance criteria are based on guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. For the purposes of this report, impacts would be potentially significant if the Project results in or causes:

- A. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- B. Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels.
- C. A substantial permanent increase in ambient noise levels in the Project vicinity above existing levels without the proposed Project; or
- D. A substantial temporary or periodic increase in ambient noise levels in the Project vicinity above noise levels existing without the proposed Project.
- E. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the Project area to excessive noise levels.
- F. For a project within the vicinity of a private airstrip, expose people residing or working in the Project area to excessive noise levels.

While the CEQA Guidelines and the City of San Bernardino General Plan Guidelines provide direction on noise compatibility and establish noise standards by land use type that are sufficient to assess the significance of noise impacts under CEQA Guideline A, they do not define the levels at which increases are considered substantial for use under Guidelines B, C, and D. CEQA Guidelines E and F apply to nearby public and private airports, if any, and the Project's land use compatibility. The closest airport which would require additional noise analysis under CEQA guidelines E and F is the San Bernardino International Airport (SBIA). As previously shown on Exhibit 3-C, the Project site is located within the 65 to 70 dBA CNEL noise level contour boundary of the SBIA. However, no Project buildings are in the portion of the Project site within the 65 to 70 dBA CNEL noise level contour boundary, and no exterior noise level standards are identified for industrial land uses in the City of San Bernardino General Plan Noise Element. Therefore, the potential impacts under CEQA guidelines E and F are *less than significant*, and are not further analyzed in this noise study.

4.1 NOISE-SENSITIVE RECEIVERS

Noise level increases resulting from the Project are evaluated based on the Appendix G CEQA Guidelines described above at the closest sensitive receiver locations. Under CEQA, consideration must be given to the magnitude of the increase, the existing ambient noise levels, and the location of noise-sensitive receivers to determine if a noise increase represents a significant adverse environmental impact. This approach recognizes *that there is no single noise increase that renders the noise impact significant.* (18)



Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise or of the corresponding human reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted—the so-called *ambient* environment.

In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will typically be judged. The Federal Interagency Committee on Noise (FICON) (19) developed guidance to be used for the assessment of project-generated increases in noise levels that consider the ambient noise level. The FICON recommendations are based on studies that relate aircraft noise levels to the percentage of persons highly annoyed by aircraft noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, these recommendations are often used in environmental noise impact assessments involving the use of cumulative noise exposure metrics, such as the average-daily noise level (i.e., CNEL).

For example, if the ambient noise environment is quiet (<60 dBA) and the new noise source greatly increases the noise levels, an impact may occur if the noise criteria may be exceeded. Therefore, for this analysis, FICON identifies a *readily perceptible* 5 dBA or greater project-related noise level increase is considered a significant impact when the noise criteria for a given land use is exceeded. According to the FICON, in areas where the without project noise levels range from 60 to 65 dBA, a 3 dBA *barely perceptible* noise level increase appears to be appropriate for most people. When the without project noise levels already exceed 65 dBA, any increase in community noise louder than 1.5 dBA or greater is considered a significant impact if the noise criteria for a given land use is exceeded, since it likely contributes to an existing noise exposure exceedance. Table 4-1 below provides a summary of the potential noise impact significance criteria, based on guidance from FICON.

Without Project Noise Level	Potential Significant Impact
< 60 dBA	5 dBA or more
60 - 65 dBA	3 dBA or more
> 65 dBA	1.5 dBA or more

 TABLE 4-1: SIGNIFICANCE OF NOISE IMPACTS AT NOISE-SENSITIVE RECEIVERS

Federal Interagency Committee on Noise (FICON), 1992.

4.2 NON-NOISE-SENSITIVE RECEIVERS

The City of San Bernardino General Plan Noise Element, Figure N-1, *Land Use Compatibility for Community Noise Exposure* was used to establish the satisfactory noise levels of significance for non-noise-sensitive land uses in the Project study area, such as Industrial land uses. As previously shown on Exhibit 3-A, the *normally acceptable* exterior noise level for non-noise-sensitive land use, such as industrial use, is 70 dBA CNEL. Noise levels greater than 70 dBA CNEL are considered *conditionally acceptable* according to the *Land Use Compatibility for Community Noise Exposure*.



To determine if Project-related traffic noise level increases are significant at off-site non-noisesensitive land uses, a *readily perceptible* 5 dBA and *barely perceptible* 3 dBA criteria are used. When the without Project noise levels at the non-noise-sensitive land uses are below the *normally acceptable* 70 dBA CNEL compatibility criteria, a *readily perceptible* 5 dBA or greater noise level increase is considered a significant impact. When the without Project noise levels are greater than the *normally acceptable* 70 dBA CNEL land use compatibility criteria, a *barely perceptible* 3 dBA or greater noise level increase is considered a significant impact since the noise level criteria is already exceeded. The noise level increases used to determine significant impacts for non-noise-sensitive land uses is generally consistent with the FICON noise level increase thresholds for noise-sensitive land uses but instead rely on the City of San Bernardino General Plan Noise Element, Table N-1, *Land Use Compatibility for Community Noise Exposure normally acceptable* 70 dBA CNEL exterior noise level criteria.

Noise impacts shall be considered significant if any of the following occur as a direct result of the proposed development. Table 4-2 shows the significance criteria summary matrix.

4.3 SIGNIFICANCE CRITERIA SUMMARY

Noise impacts shall be considered significant if any of the following occur as a direct result of the proposed development. Table 4-2 shows the significance criteria summary matrix.

OFF-SITE TRAFFIC NOISE

- When the noise levels at existing and future noise-sensitive land uses (e.g. residential, etc.):
 - are less than 60 dBA and the Project creates a *readily perceptible* 5 dBA or greater Projectrelated noise level increase; or
 - range from 60 to 65 dBA and the Project creates a *barely perceptible* 3 dBA or greater Project-related noise level increase; or
 - already exceed 65 dBA, and the Project creates a community noise level impact of greater than 1.5 dBA (FICON, 1992).
- When the noise levels at existing and future non-noise-sensitive land uses (e.g. industrial, etc.):
 - are less than the City of San Bernardino General Plan Noise Element, Figure N-1, normally acceptable 70 dBA and the Project creates a readily perceptible 5 dBA or greater Projectrelated noise level increase; or
 - are greater than the City of San Bernardino General Plan Noise Element, Table N-1, *normally acceptable* 70 dBA and the Project creates a *barely perceptible* 3 dBA or greater Project-related noise level increase.

OPERATIONAL NOISE

- If Project-related operational (stationary source) noise levels exceed the exterior 65 dBA Leq noise level standards at nearby sensitive residential land uses (City of San Bernardino Development Code, Section 19.20.030.15(A)); or
- If the existing ambient noise levels at the nearby noise-sensitive receivers near the Project site:
 - are less than 60 dBA and the Project creates a *readily perceptible* 5 dBA or greater Projectrelated noise level increase; or



- range from 60 to 65 dBA and the Project creates a *barely perceptible* 3 dBA or greater Project-related noise level increase; or
- already exceed 65 dBA, and the Project creates a community noise level impact of greater than 1.5 dBA (FICON, 1992).

CONSTRUCTION NOISE AND VIBRATION

- If Project-related construction activities:
 - occur any time other than between the permitted hours of 7:00 a.m. and 8:00 p.m. on any day (City of San Bernardino Municipal Code, Section 8.54.070); and
 - create noise levels which exceed the 85 dBA Leq acceptable noise level threshold at the nearby sensitive receiver locations (NIOSH, Criteria for Recommended Standard: Occupational Noise Exposure).
- If short-term Project generated construction vibration levels exceed the City of San Bernardino acceptable vibration standard of 0.7 in/sec (RMS) at sensitive receiver locations (City of San Bernardino Municipal Code, Section 15.68.020).

Anakaia			Significan	ce Criteria	
Analysis	Land Use	Condition(s)	Daytime	Nighttime	
		if ambient is < 60 dBA CNEL	≥ 5 dBA CNEL F	Project increase	
Off-Site	Noise- Sensitive ¹	if ambient is 60 - 65 dBA CNEL	≥ 3 dBA CNEL F	Project increase	
	Jensitive	if ambient is > 65 dBA CNEL	≥ 1.5 dBA CNEL Project increase		
	Non-Noise- Sensitive ²	if ambient is < 70 dBA CNEL	≥ 5 dBA CNEL Project increase		
		if ambient is > 70 dBA CNEL	≥ 3 dBA CNEL Project increase		
Operational ³	Noise- Sensitive	Exterior Residential Land Use	65 dBA Leq		
	Perm	itted hours between 7:00 a.m. to	8:00 p.m. on any d	ay.	
Construction ⁴	Noise-	Noise Level Threshold ⁵	85 dBA Leq	n/a	
	Sensitive	Vibration Level Threshold ⁶	0.7 in/sec	n/a	

TABLE 4-2: SIGNIFICANCE CRITERIA SUMMARY

¹ Source: FICON, 1992.

² Source: City of San Bernardino General Plan Noise Element, Figure N-1.

³ Source: City of San Bernardino Development Code, Section 19.20.030.15(A) (Appendix 3.1).

⁴ Source: City of San Bernardino Municipal Code, Section 8.54.070 (Appendix 3.2).

⁵ Source: NIOSH, Criteria for Recommended Standard: Occupational Noise Exposure.

⁶ Source: Section 15.68.020 of the City of San Bernardino Municipal Code (Appendix 3.1).

"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.



5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, eight 24-hour noise level measurements were taken at sensitive receiver locations in the Project study area. The receiver locations were selected to describe and document the existing noise environment within the Project study area. Exhibit 5-A provides the boundaries of the Project study area and the noise level measurement locations. To fully describe the existing noise conditions, noise level measurements were collected by Urban Crossroads, Inc. on Wednesday, July 6th, 2016. Appendix 5.1 includes study area photos.

5.1 MEASUREMENT PROCEDURE AND CRITERIA

To describe the existing noise environment, the hourly noise levels were measured during typical weekday conditions over a 24-hour period. By collecting individual hourly noise level measurements, it is possible to describe the daytime and nighttime hourly noise levels and calculate the 24-hour CNEL. The long-term noise readings were recorded using Piccolo Type 2 integrating sound level meter and dataloggers. The Piccolo sound level meters were calibrated using a Larson-Davis calibrator, Model CAL 150. All noise meters were programmed in "slow" mode to record noise levels in "A" weighted form. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (20)

5.2 NOISE MEASUREMENT LOCATIONS

The long-term noise level measurements were positioned as close to the nearest sensitive receiver locations as possible to assess the existing ambient hourly noise levels surrounding the Project site. Both Caltrans and the FTA recognize that it is not reasonable to collect noise level measurements that can fully represent any part of a private yard, patio, deck, or balcony normally used for human activity when estimating impacts for new development projects. This is demonstrated in the Caltrans general site location guidelines which indicate that, *sites must be free of noise contamination by sources other than sources of interest. Avoid sites located near sources such as barking dogs, lawnmowers, pool pumps, and air conditioners unless it is the express intent of the analyst to measure these sources. (6) Further, FTA guidance states, that it is not necessary nor recommended that existing noise exposure be determined by measuring at every noise-sensitive location in the project area. Rather, the recommended approach is to characterize the noise environment for clusters of sites based on measurements or estimates at representative locations in the community. (13)*

Based on recommendations of Caltrans and the FTA, it is not necessary to collect measurements at each individual building or residence, because each receiver measurement represents a group of buildings that share acoustical equivalence. (13) In other words, the area represented by the receiver shares similar shielding, terrain, and geometric relationship to the reference noise source. Receivers represent a location of noise sensitive areas and are used to estimate the future noise level impacts. Collecting reference ambient noise level measurements at the nearby



sensitive receiver locations allows for a comparison of the before and after Project noise levels and is necessary to assess potential noise impacts due to the Project's contribution to the ambient noise levels.

5.3 NOISE MEASUREMENT RESULTS

The noise measurements presented below focus on the average or equivalent sound levels (Leq). The equivalent sound level (Leq) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. Table 5-1 identifies the hourly daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) noise levels at each noise level measurement location. Appendix 5.2 provides a summary of the existing hourly ambient noise levels described below:

- Location L1 represents the noise levels north of the Project site on Orange Show Road adjacent to existing residential homes. The noise level measurements collected show an overall 24-hour exterior noise level of 79.4 dBA CNEL. The hourly noise levels measured at location L1 ranged from 71.6 to 78.4 dBA Leq during the daytime hours and from 68.4 to 74.6 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 76.1 dBA Leq with an average nighttime noise level of 71.7 dBA Leq.
- Location L2 represents the noise levels north of the Project site on Washington Avenue south of Orange Show Road near existing residential homes. The noise level measurements collected show an overall 24-hour exterior noise level of 62.7 dBA CNEL. The hourly noise levels measured at location L2 ranged from 55.4 to 64.5 dBA Leq during the daytime hours and from 50.6 to 58.4 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 59.4 dBA Leq with an average nighttime noise level of 54.9 dBA Leq.
- Location L3 represents the noise levels north of the Project site on Dumas Street, west of Waterman Avenue, near an existing church and residential homes. The 24-hour CNEL indicates that the overall exterior noise level is 66.0 dBA CNEL. At location L3 the background ambient noise levels ranged from 58.7 to 65.3 dBA Leq during the daytime hours to levels of 54.0 to 62.0 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 60.9 dBA Leq with an average nighttime noise level of 58.9 dBA Leq.
- Located north of the Project site, location L4 represents the noise levels in the existing parking lot
 of the San Bernardino Public Golf Course. The noise level measurements collected show an overall
 24-hour exterior noise level of 58.3 dBA CNEL. The hourly noise levels measured at location L4
 ranged from 45.9 to 54.5 dBA Leq during the daytime hours and from 47.8 to 52.9 dBA Leq during
 the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 52.3
 dBA Leq with an average nighttime noise level of 51.4 dBA Leq.
- Location L5 represents the noise levels east of the Project site on Park Center Circle adjacent to
 existing office buildings. The noise level measurements collected show an overall 24-hour exterior
 noise level of 68.6 dBA CNEL. The hourly noise levels measured at location L5 ranged from 55.2
 to 70.5 dBA Leq during the daytime hours and from 49.5 to 67.1 dBA Leq during the nighttime
 hours. The energy (logarithmic) average daytime noise level was calculated at 62.5 dBA Leq with
 an average nighttime noise level of 61.2 dBA Leq.
- Location L6 represents the noise levels near the southern Project site boundary and the Santa Ana River. The noise level measurements collected show an overall 24-hour exterior noise level of 58.9 dBA CNEL. The hourly noise levels measured at location L6 ranged from 50.8 to 54.3 dBA Leq



during the daytime hours and from 48.1 to 53.8 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 53.1 dBA Leq with an average nighttime noise level of 51.8 dBA Leq.

- Location L7 represents the noise levels south of the Project site in an existing parking lot for a Quality Inn hotel on Waterman Avenue. The 24-hour CNEL indicates that the overall exterior noise level is 57.4 dBA CNEL. At location L7 the background ambient noise levels ranged from 48.5 to 55.2 dBA Leq during the daytime hours to levels of 45.8 to 51.6 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 52.3 dBA Leq with an average nighttime noise level of 50.2 dBA Leq.
- Located south of the Project site, location L8 represents the noise levels adjacent to office buildings on Commercenter West and the Santa Ana River Trail. The noise level measurements collected show an overall 24-hour exterior noise level of 58.2 dBA CNEL. The hourly noise levels measured at location L8 ranged from 48.9 to 55.6 dBA Leq during the daytime hours and from 46.7 to 52.5 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 53.0 dBA Leq with an average nighttime noise level of 51.0 dBA Leq.

Table 5-1 provides the (energy average) noise levels used to describe the daytime and nighttime ambient conditions. These daytime and nighttime energy average noise levels represent the average of all hourly noise levels observed during these time periods expressed as a single number. Appendix 5.2 provides summary worksheets of the noise levels for each hour as well as the minimum, maximum, L₁, L₂, L₅, L₈, L₂₅, L₅₀, L₉₀, L₉₅, and L₉₉ percentile noise levels observed during the daytime and nighttime periods.

The background ambient noise levels in the Project study area are dominated by the transportation-related noise associated with the arterial roadway network. This includes the auto and heavy truck activities on Orange Show Road and Waterman Avenue near the noise level measurement locations. Additional background noise sources in the Project study area include aircraft overflight noise from the San Bernardino International Airport. The 24-hour existing noise level measurements are shown on Table 5-1.



EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS

Noise Measurement Locations



Location ¹	Distance To Project	Description	Hourly N	Average oise Level Leq) ²	CNEL
	Boundary (Feet)		Daytime	Nighttime	
L1	1,620'	Located north of the Project site on Orange Show Road adjacent to existing residential homes.	76.1	71.7	79.4
L2	0'	Located north of the Project site on Washington Avenue south of Orange Show Road near existing residential homes.	59.4	54.9	62.7
L3	920'	Located north of the Project site on Dumas Street, west of Waterman Avenue, near an existing church and residential homes.	60.9	58.9	66.0
L4	76'	Located north of the Project site in the existing parking lot of the San Bernardino Public Golf Course.	52.3	51.4	58.3
L5	362'	Located east of the Project site on Park Center Circle adjacent to existing office buildings.	62.5	61.2	68.6
L6	75'	Located near the southern Project site boundary and the Santa Ana River.	53.1	51.8	58.9
L7	825'	Located south of the Project site in an existing parking lot for a Quality Inn hotel on Waterman Avenue.	52.3	50.2	57.4
L8	818'	Located south of the Project site adjacent to office buildings on Commercenter West and the Santa Ana River Trail.	53.0	51.0	58.2

TABLE 5-1: 24-HOUR AMBIENT NOISE LEVEL MEASUREMENTS

¹ See Exhibit 5-A for the noise level measurement locations.

² Energy (logarithmic) average hourly levels. The long-term 24-hour measurement worksheets are included in Appendix 5.2. "Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.



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6 METHODS AND PROCEDURES

The following section outlines the methods and procedures used to model and analyze the future traffic noise environment.

6.1 FHWA TRAFFIC NOISE PREDICTION MODEL

The expected roadway noise level increases from vehicular traffic were calculated by Urban Crossroads, Inc. using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108. (21) The FHWA Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). In California the national REMELs are substituted with the California Vehicle Noise (Calveno) Emission Levels. (22) Adjustments are then made to the REMEL to account for: the roadway classification (e.g., collector, secondary, major or arterial), the roadway active width (i.e., the distance between the center of the outermost travel lanes on each side of the roadway), the total average daily traffic (ADT), the travel speed, the percentages of automobiles, medium trucks, and heavy trucks in the traffic volume, the roadway grade, the angle of view (e.g., whether the roadway view is blocked), the site conditions ("hard" or "soft" relates to the absorption of the ground, pavement, or landscaping), and the percentage of total ADT which flows each hour throughout a 24-hour period. Research conducted by Caltrans has shown that the use of soft site conditions is appropriate for the application of the FHWA traffic noise prediction model used in this analysis. (23)

6.2 OFF-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

Table 6-1 presents the roadway parameters used to assess the Project's off-site transportation noise impacts. Table 6-1 identifies the 11 study area roadway segments, the distance from the centerline to adjacent land use based on the functional roadway classifications according to the City of San Bernardino *General Plan Circulation Element*, and the posted vehicle speeds. The ADT volumes used in this study are presented on Tables 6-2 and 6-3 and were obtained from the *Gateway South Building 4 Traffic Impact Analysis* prepared by Urban Crossroads, Inc., for the following traffic scenarios: Existing, Existing plus Ambient (EA) 2018, EA plus Cumulative (EAC) 2018, and Horizon Year 2040 ADT volumes. (1) Table 6-4 provides the time of day (daytime, evening, and nighttime) vehicle splits.



ID	Roadway	Segment	Adjacent Planned (Existing) Land Use ¹	Distance from Centerline to Nearest Adjacent Land Use (Feet) ²	Posted Speed Limit (mph)
1	Washington Av.	s/o Orange Show Rd.	Industrial Light (Residential)	30'	25
2	Waterman Av.	s/o Orange Show Rd.	Industrial Heavy (Office/Public)	50'	50
3	Waterman Av.	s/o Dumas St.	Industrial Heavy (Office/Public)	50'	50
4	Waterman Av.	s/o Park Center Dr.	Industrial Heavy (Public)	50'	50
5	Waterman Av.	n/o Hospitality Ln.	Commercial Regional (Public)	50'	50
6	Waterman Av.	s/o Hospitality Ln.	Commercial Regional (Commercial)	50'	50
7	Auto Center Rd.	e/o I-215 Fwy.	Commercial General (Commercial)	50'	40
8	Orange Show Rd.	e/o E St.	Industrial Light (Commercial/Ind.)	50'	50
9	Orange Show Rd.	e/o Arrowhead Av.	Industrial Light (Industrial)	50'	50
10	Orange Show Rd.	e/o Washington Av.	Industrial Light (Residential)	50'	50
11	Orange Show Rd.	e/o Waterman Av.	Industrial Light (Residential/Ind.)	50'	50

TABLE 6-1: OFF-SITE ROADWAY PARAMETERS

¹ Sources: City of San Bernardino General Plan Land Use Element, Figure LU-2 and Google Earth imagery.

² Distance to adjacent land use is based upon the right-of-way distances for each functional roadway classification provided in the General Plan Circulation Elements.

	Roadway		Average Daily Traffic Volumes ¹			
ID		Segment	Existing (2017)		Existing + Ambient (EA) 2018	
			Without Project	With Project	Without Project	With Project
1	Washington Av.	s/o Orange Show Rd.	500	773	500	773
2	Waterman Av.	s/o Orange Show Rd.	25,800	26,610	26,500	27,310
3	Waterman Av.	s/o Dumas St.	23,500	24,310	24,200	25,010
4	Waterman Av.	s/o Park Center Dr.	29,800	30,508	30,700	31,408
5	Waterman Av.	n/o Hospitality Ln.	25,000	25,708	25,800	26,508
6	Waterman Av.	s/o Hospitality Ln.	40,600	41,128	41,800	42,328
7	Auto Center Rd.	e/o I-215 Fwy.	38,400	39,205	39,600	40,405
8	Orange Show Rd.	e/o E St.	31,200	32,061	32,100	32,961
9	Orange Show Rd.	e/o Arrowhead Av.	24,400	25,283	25,200	26,083
10	Orange Show Rd.	e/o Washington Av.	24,100	24,711	24,800	25,411
11	Orange Show Rd.	e/o Waterman Av.	21,200	21,366	21,800	21,966

TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES (1 OF 2)

¹ Source: Gateway South Building 4 Traffic Impact Analysis, Urban Crossroads, Inc., April 2017.

			Avera	ge Daily T	raffic Volu	mes ¹
ID	Roadway	Segment	EA + Cur (EAC)		Horizon Year 2040	
			Without Project	With Project	Without Project	With Project
1	Washington Av.	s/o Orange Show Rd.	800	1,073	1,700	1,973
2	Waterman Av.	s/o Orange Show Rd.	30,800	31,610	31,800	32,610
3	Waterman Av.	s/o Dumas St.	28,500	29,310	33,800	34,610
4	Waterman Av.	s/o Park Center Dr.	34,900	35,608	41,600	42,308
5	Waterman Av.	n/o Hospitality Ln.	29,900	30,608	35,700	36,408
6	Waterman Av.	s/o Hospitality Ln.	45,600	46,128	54,700	55,228
7	Auto Center Rd.	e/o I-215 Fwy.	45,400	46,205	39,100	39,905
8	Orange Show Rd.	e/o E St.	37,300	38,161	30,200	31,061
9	Orange Show Rd.	e/o Arrowhead Av.	29,100	29,983	21,300	22,183
10	Orange Show Rd.	e/o Washington Av.	28,700	29,311	34,100	34,711
11	Orange Show Rd.	e/o Waterman Av.	26,900	27,066	20,900	21,066

 TABLE 6-3: AVERAGE DAILY TRAFFIC VOLUMES (2 OF 2)

¹ Source: Gateway South Building 4 Traffic Impact Analysis, Urban Crossroads, Inc., April 2017.

TABLE 6-4: TIME OF DAY VEHICLE SPLITS

Vehicle Type		Time of Day Splits ¹				
	Daytime	Evening	Nighttime	Day Splits		
Autos	82.90%	7.12%	9.98%	100.00%		
Medium Trucks	82.77%	5.57%	11.66%	100.00%		
Heavy Trucks	69.34%	8.68%	21.98%	100.00%		

Based on existing 24-hour counts by vehicle type taken on 3/7/2017 at Waterman Avenue and Park Center Drive (Gateway South Building 4 Traffic Impact Analysis, Urban Crossroads, Inc., April 2017). Values rounded to the nearest one-hundredth. "Daytime" = 7:00 a.m. to 7:00 p.m.; "Evening" = 7:00 p.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

According to the *Gateway South Building 4 Traffic Impact Analysis* prepared by Urban Crossroads, Inc., the Project is expected to generate a net total of approximately 1,789 trip-ends per day (actual vehicles) with 117 AM peak hour trips and 127 PM peak hour trips. (1) The net Project trip generation includes 682 truck trip-ends per day from the proposed buildings within the Project site. This noise study relies on the net Project trips to accurately account for the effect of individual truck trips on the study area roadway network.

To quantify the off-site noise levels, the Project related truck trips were added to the heavy truck category in the FHWA noise prediction model. The addition of the Project related truck trips increases the percentage of heavy trucks in the vehicle mix. This approach recognizes that the FHWA noise prediction model is significantly influenced by the number of heavy trucks in the vehicle mix.



The 682 daily Project truck trip-ends were assigned to the 11 individual off-site study area roadway segments based on the Project truck trip distribution percentages documented in the *Traffic Impact Analysis*. Using the Project truck trips in combination with the Project trip distribution, Urban Crossroads, Inc. calculated the number of additional Project truck trips and vehicle mix percentages for each of the study area roadway segments. Table 6-5 shows the traffic flow by vehicle type (vehicle mix) used for all without Project traffic scenarios, and Tables 6-6 to 6-9 show the vehicle mixes used for the with Project traffic scenarios.

Classification		Total		
Classification	Autos	Medium Trucks	Heavy Trucks	Total
All Segments	90.45%	6.42%	3.14%	100.00%

TABLE 6-5: WITHOUT PROJECT CONDITIONS VEHICLE MIX

¹ Based on existing 24-hour counts by vehicle type taken on 3/7/2017 at Waterman Avenue and Park Center Drive (Gateway South Building 4 Traffic Impact Analysis, Urban Crossroads, Inc., March 2017). Values rounded to the nearest one-hundredth. "Daytime" = 7:00 a.m. to 7:00 p.m.; "Evening" = 7:00 p.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

				With P	roject ¹	
ID	Roadway	Segment	Autos	Medium Trucks	Heavy Trucks	Total ²
1	Washington Av.	s/o Orange Show Rd.	58.50%	11.91%	29.58%	100.00%
2	Waterman Av.	s/o Orange Show Rd.	90.61%	6.25%	3.14%	100.00%
3	Waterman Av.	s/o Dumas St.	90.62%	6.24%	3.14%	100.00%
4	Waterman Av.	s/o Park Center Dr.	89.44%	6.54%	4.02%	100.00%
5	Waterman Av.	n/o Hospitality Ln.	89.25%	6.56%	4.19%	100.00%
6	Waterman Av.	s/o Hospitality Ln.	89.91%	6.48%	3.61%	100.00%
7	Auto Center Rd.	e/o I-215 Fwy.	89.86%	6.46%	3.68%	100.00%
8	Orange Show Rd.	e/o E St.	89.75%	6.46%	3.80%	100.00%
9	Orange Show Rd.	e/o Arrowhead Av.	89.57%	6.46%	3.97%	100.00%
10	Orange Show Rd.	e/o Washington Av.	90.54%	6.29%	3.17%	100.00%
11	Orange Show Rd.	e/o Waterman Av.	90.52%	6.37%	3.11%	100.00%

TABLE 6-6: EXISTING WITH PROJECT CONDITIONS VEHICLE MIX

¹ Source: Gateway South Building 4 Traffic Impact Analysis, Urban Crossroads, Inc., April 2017.

² Total of vehicle mix percentage values rounded to the nearest one-hundredth.



			With Project ¹				
ID	Roadway	Segment	Autos	Medium Trucks	Heavy Trucks	Total ²	
1	Washington Av.	s/o Orange Show Rd.	58.50%	11.91%	29.58%	100.00%	
2	Waterman Av.	s/o Orange Show Rd.	90.60%	6.26%	3.14%	100.00%	
3	Waterman Av.	s/o Dumas St.	90.62%	6.24%	3.14%	100.00%	
4	Waterman Av.	s/o Park Center Dr.	89.47%	6.54%	4.00%	100.00%	
5	Waterman Av.	n/o Hospitality Ln.	89.28%	6.56%	4.16%	100.00%	
6	Waterman Av.	s/o Hospitality Ln.	89.92%	6.48%	3.60%	100.00%	
7	Auto Center Rd.	e/o I-215 Fwy.	89.88%	6.46%	3.66%	100.00%	
8	Orange Show Rd.	e/o E St.	89.76%	6.46%	3.78%	100.00%	
9	Orange Show Rd.	e/o Arrowhead Av.	89.59%	6.46%	3.95%	100.00%	
10	Orange Show Rd.	e/o Washington Av.	90.54%	6.30%	3.17%	100.00%	
11	Orange Show Rd.	e/o Waterman Av.	90.52%	6.37%	3.11%	100.00%	

TABLE 6-7: EA 2018 WITH PROJECT CONDITIONS VEHICLE MIX

¹ Source: Gateway South Building 4 Traffic Impact Analysis, Urban Crossroads, Inc., April 2017.

² Total of vehicle mix percentage values rounded to the nearest one-hundredth.

				With P	roject ¹	
ID	Roadway	Segment	Autos	Medium Trucks	Heavy Trucks	Total ²
1	Washington Av.	s/o Orange Show Rd.	67.43%	10.38%	22.19%	100.00%
2	Waterman Av.	s/o Orange Show Rd.	90.58%	6.28%	3.14%	100.00%
3	Waterman Av.	s/o Dumas St.	90.59%	6.27%	3.14%	100.00%
4	Waterman Av.	s/o Park Center Dr.	89.58%	6.52%	3.90%	100.00%
5	Waterman Av.	n/o Hospitality Ln.	89.44%	6.54%	4.02%	100.00%
6	Waterman Av.	s/o Hospitality Ln.	89.96%	6.47%	3.56%	100.00%
7	Auto Center Rd.	e/o I-215 Fwy.	89.95%	6.45%	3.60%	100.00%
8	Orange Show Rd.	e/o E St.	89.86%	6.45%	3.69%	100.00%
9	Orange Show Rd.	e/o Arrowhead Av.	89.70%	6.46%	3.84%	100.00%
10	Orange Show Rd.	e/o Washington Av.	90.53%	6.31%	3.16%	100.00%
11	Orange Show Rd.	e/o Waterman Av.	90.51%	6.38%	3.12%	100.00%

TABLE 6-8: EAC 2018 WITH PROJECT CONDITIONS VEHICLE MIX

¹ Source: Gateway South Building 4 Traffic Impact Analysis, Urban Crossroads, Inc., April 2017.

² Total of vehicle mix percentage values rounded to the nearest one-hundredth.



	Roadway			With P	roject ¹	
ID		Segment	Autos	Medium Trucks	Heavy Trucks	Total ²
1	Washington Av.	s/o Orange Show Rd.	77.93%	8.57%	13.50%	100.00%
2	Waterman Av.	s/o Orange Show Rd.	90.58%	6.28%	3.14%	100.00%
3	Waterman Av.	s/o Dumas St.	90.57%	6.29%	3.14%	100.00%
4	Waterman Av.	s/o Park Center Dr.	89.72%	6.51%	3.78%	100.00%
5	Waterman Av.	n/o Hospitality Ln.	89.60%	6.52%	3.88%	100.00%
6	Waterman Av.	s/o Hospitality Ln.	90.04%	6.47%	3.49%	100.00%
7	Auto Center Rd.	e/o I-215 Fwy.	89.87%	6.46%	3.67%	100.00%
8	Orange Show Rd.	e/o E St.	89.72%	6.46%	3.82%	100.00%
9	Orange Show Rd.	e/o Arrowhead Av.	89.44%	6.47%	4.09%	100.00%
10	Orange Show Rd.	e/o Washington Av.	90.51%	6.33%	3.16%	100.00%
11	Orange Show Rd.	e/o Waterman Av.	90.52%	6.37%	3.11%	100.00%

TABLE 6-9: HORIZON YEAR 2040 WITH PROJECT CONDITIONS VEHICLE MIX

¹ Source: Gateway South Building 4 Traffic Impact Analysis, Urban Crossroads, Inc., April 2017.

² Total of vehicle mix percentage values rounded to the nearest one-hundredth.

6.3 VIBRATION ASSESSMENT

This analysis focuses on the potential ground-borne vibration associated with vehicular traffic and construction activities. Ground-borne vibration levels from automobile traffic are generally overshadowed by vibration generated by heavy trucks that roll over the same uneven roadway surfaces. However, due to the rapid drop-off rate of ground-borne vibration and the short duration of the associated events, vehicular traffic-induced ground-borne vibration is rarely perceptible beyond the roadway right-of-way, and rarely results in vibration levels that cause damage to buildings in the vicinity.

However, while vehicular traffic is rarely perceptible, construction has the potential to result in varying degrees of temporary ground vibration, depending on the specific construction activities and equipment used. Ground vibration levels associated with various types of construction equipment are summarized on Table 6-10. Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the human response (annoyance) using the following vibration assessment methods defined by the FTA. To describe the human response (annoyance) associated with vibration impacts the FTA provides the following equation: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$



Equipment	PPV (in/sec) at 25 feet
Small bulldozer	0.003
Jackhammer	0.035
Loaded Trucks	0.076
Large bulldozer	0.089

TABLE 6-10: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2006.



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7 OFF-SITE TRANSPORTATION NOISE IMPACTS

To assess the off-site transportation CNEL noise level impacts associated with the proposed Project, noise contours were developed based on the *Gateway South Building 4 Traffic Impact Analysis*. (1) Noise contour boundaries represent the equal levels of noise exposure and are measured in CNEL from the center of the roadway. Noise contours were developed for the following traffic scenarios:

- <u>Existing Without / With Project</u>: This scenario refers to the existing present-day noise conditions, without and with the proposed Project.
- <u>Existing plus Ambient (EA) 2018 Without / With Project</u>: This scenario refers to the background noise conditions at future Year 2018 without and with the proposed Project plus ambient growth.
- <u>EA plus Cumulative 2018 Without / With Project</u>: This scenario refers to the background noise conditions at future Year 2018 without and with the proposed Project plus ambient growth. This scenario corresponds to Year 2018 conditions, and includes all cumulative projects identified in the *Traffic Impact Analysis*.
- <u>Horizon Year 2040 Without / With Project</u>: This scenario refers to the background noise conditions at future Year 2040 without and with the proposed Project. This scenario corresponds to Horizon Year 2040 conditions, and includes all cumulative projects identified in the *Traffic Impact Analysis*.

7.1 TRAFFIC NOISE CONTOURS

To quantify the Project's operational traffic noise impacts on the surrounding areas, the changes in traffic noise levels on 11 roadway segments surrounding the Project were calculated based on the changes in the average daily traffic volumes. Based on the noise impact significance criteria described in Section 4 and shown on Table 4-2, a significant off-site traffic noise level impact occurs:

- When the noise levels at existing and future noise-sensitive land uses (e.g. residential, etc.):
 - are less than 60 dBA and the Project creates a *readily perceptible* 5 dBA or greater Projectrelated noise level increase; or
 - range from 60 to 65 dBA and the Project creates a *barely perceptible* 3 dBA or greater Project-related noise level increase; or
 - already exceed 65 dBA, and the Project creates a community noise level impact of greater than 1.5 dBA (FICON, 1992).
- When the noise levels at existing and future non-noise-sensitive land uses (e.g. industrial, etc.):
 - are less than the City of San Bernardino General Plan Noise Element, Figure N-1, normally acceptable 70 dBA and the Project creates a readily perceptible 5 dBA or greater Projectrelated noise level increase; or
 - are greater than the City of San Bernardino General Plan Noise Element, Table N-1, *normally acceptable* 70 dBA and the Project creates a *barely perceptible* 3 dBA or greater Project-related noise level increase.



Noise contours were used to assess the Project's incremental traffic-related noise impacts at land uses adjacent to roadways conveying Project traffic. The noise contours represent the distance to noise levels of a constant value and are measured from the center of the roadway for the 70, 65, and 60 dBA noise levels. The noise contours do not consider the effect of any existing noise barriers or topography that may attenuate ambient noise levels. In addition, because the noise contours reflect modeling of vehicular noise on area roadways, they appropriately do not reflect noise contributions from the surrounding stationary noise sources within the Project study area. Tables 7-1 through 7-8 present a summary of the exterior traffic noise levels, without barrier attenuation, for the 11 study area roadway segments analyzed from the without Project to the with Project conditions in each of the three timeframes: Existing, Existing plus Ambient (EA) 2018, EA plus Cumulative (EAC) 2018, and Horizon Year 2040 conditions. Appendix 7.1 includes a summary of the traffic noise level contours for each of the eight traffic scenarios.

			Adjacent	CNEL at Nearest	Distance to Contour from Centerline (Feet)		
ID	Road	Segment	Planned (Existing) Land Use ¹	Adjacent Land Use (dBA) ²	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Washington Av.	s/o Orange Show Rd.	Industrial Light (Residential)	55.7	RW	RW	RW
2	Waterman Av.	s/o Orange Show Rd.	Industrial Heavy (Office/Public)	rial Heavy (Office/Public) 76.7		300	646
3	Waterman Av.	s/o Dumas St.	Industrial Heavy (Office/Public) 76.3		131	282	607
4	Waterman Av.	s/o Park Center Dr.	Industrial Heavy (Public)	77.3	153	330	711
5	Waterman Av.	n/o Hospitality Ln.	Commercial Regional (Public)	76.5	136	294	633
6	Waterman Av.	s/o Hospitality Ln.	Commercial Regional (Commercial)	78.6	188	406	874
7	Auto Center Rd.	e/o I-215 Fwy.	Commercial General (Commercial)	76.4	134	290	624
8	Orange Show Rd.	e/o E St.	Industrial Light (Commercial/Ind.)	77.5	158	340	733
9	Orange Show Rd.	e/o Arrowhead Av.	Industrial Light (Industrial)	76.4	134	289	622
10	Orange Show Rd.	e/o Washington Av.	Industrial Light (Residential)	76.4	133	287	617
11	Orange Show Rd.	e/o Waterman Av.	Industrial Light (Residential/Ind.)	75.8	122	263	567

TABLE 7-1: EXISTING WITHOUT PROJECT CONDITIONS NOISE CONTOURS

¹ Sources: City of San Bernardino General Plan Land Use Element, Figure LU-2 and Google Earth imagery.

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.



			Adjacent	CNEL at Nearest	Distance to Contour from Centerline (Feet)		
ID	Road	Segment Planned (Existing) Land Use ¹		Adjacent Land Use (dBA) ²	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Washington Av.	s/o Orange Show Rd.	Industrial Light (Residential)	65.9	RW	34	74
2	Waterman Av.	s/o Orange Show Rd.	Industrial Heavy (Office/Public) 76.8		142	305	657
3	Waterman Av.	s/o Dumas St.	Industrial Heavy (Office/Public) 76.4		133	287	619
4	Waterman Av.	s/o Park Center Dr.	Industrial Heavy (Public)	78.0	170	366	788
5	Waterman Av.	n/o Hospitality Ln.	Commercial Regional (Public)	77.3	154	331	713
6	Waterman Av.	s/o Hospitality Ln.	Commercial Regional (Commercial)	79.0	199	429	925
7	Auto Center Rd.	e/o I-215 Fwy.	Commercial General (Commercial)	76.9	145	312	672
8	Orange Show Rd.	e/o E St.	Industrial Light (Commercial/Ind.)	78.0	172	370	796
9	Orange Show Rd.	e/o Arrowhead Av.	Industrial Light (Industrial)	77.1	149	321	691
10	Orange Show Rd.	e/o Washington Av.	Industrial Light (Residential)	76.5	135	291	628
11	Orange Show Rd.	e/o Waterman Av.	Industrial Light (Residential/Ind.)	75.8	122	263	568

TABLE 7-2: EXISTING WITH PROJECT CONDITIONS NOISE CONTOURS

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-3: EA 2018 WITHOUT PROJECT CONDITIONS NOISE CONTOURS

			Adjacent	CNEL at Nearest	Distance to Contour from Centerline (Feet)		
ID	Road	Segment	Planned (Existing) Land Use ¹	Adjacent Land Use (dBA) ²	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Washington Av.	s/o Orange Show Rd.	Industrial Light (Residential) 55.7		RW	RW	RW
2	Waterman Av.	s/o Orange Show Rd.	Industrial Heavy (Office/Public)	76.8	142	305	658
3	Waterman Av.	s/o Dumas St.	Industrial Heavy (Office/Public)	76.4	133	287	619
4	Waterman Av.	s/o Park Center Dr.	Industrial Heavy (Public)	77.4	156	337	725
5	Waterman Av.	n/o Hospitality Ln.	Commercial Regional (Public)	76.7	139	300	646
6	Waterman Av.	s/o Hospitality Ln.	Commercial Regional (Commercial)	78.8	192	414	891
7	Auto Center Rd.	e/o I-215 Fwy.	Commercial General (Commercial)	76.6	137	296	637
8	Orange Show Rd.	e/o E St.	Industrial Light (Commercial/Ind.)	77.6	161	347	747
9	Orange Show Rd.	e/o Arrowhead Av.	Industrial Light (Industrial)	76.6	137	295	636
10	Orange Show Rd.	e/o Washington Av.	Industrial Light (Residential)	idential) 76.5		292	629
11	Orange Show Rd.	e/o Waterman Av.	Industrial Light (Residential/Ind.)	75.9	124	268	577

¹ Sources: City of San Bernardino General Plan Land Use Element, Figure LU-2 and Google Earth imagery.

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

			Adjacent	CNEL at Nearest	Distance to Contour from Centerline (Feet)		
ID	Road Segment Planned (Existing) Land Use ¹		Adjacent Land Use (dBA) ²	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	
1	Washington Av.	s/o Orange Show Rd.	Industrial Light (Residential)	65.9	RW	34	74
2	Waterman Av.	s/o Orange Show Rd.	Industrial Heavy (Office/Public) 76.9		144	310	669
3	Waterman Av.	s/o Dumas St.	Industrial Heavy (Office/Public) 76		136	293	631
4	Waterman Av.	s/o Park Center Dr.	Industrial Heavy (Public)	78.1	173	372	801
5	Waterman Av.	n/o Hospitality Ln.	Commercial Regional (Public)	77.4	156	337	726
6	Waterman Av.	s/o Hospitality Ln.	Commercial Regional (Commercial)	79.1	203	437	941
7	Auto Center Rd.	e/o I-215 Fwy.	Commercial General (Commercial)	77.0	147	318	684
8	Orange Show Rd.	e/o E St.	Industrial Light (Commercial/Ind.)	78.1	174	376	810
9	Orange Show Rd.	e/o Arrowhead Av.	Industrial Light (Industrial)	77.2	152	326	703
10	Orange Show Rd.	e/o Washington Av.	Industrial Light (Residential)	76.6	138	297	640
11	Orange Show Rd.	e/o Waterman Av.	Industrial Light (Residential/Ind.)	75.9	125	268	578

TABLE 7-4: EA 2018 WITH PROJECT CONDITIONS NOISE CONTOURS

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-5: EAC 2018 WITHOUT PROJECT CONDITIONS NOISE CONTOURS

			Adjacent	CNEL at Nearest	Distance to Contour from Centerline (Feet)		
ID	Road	Land Use ¹		Adjacent Land Use (dBA) ²	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Washington Av.	s/o Orange Show Rd.	Industrial Light (Residential) 57.7		RW	RW	RW
2	Waterman Av.	s/o Orange Show Rd.	Industrial Heavy (Office/Public)	77.4		337	727
3	Waterman Av.	s/o Dumas St.	Industrial Heavy (Office/Public) 77.1		149	320	690
4	Waterman Av.	s/o Park Center Dr.	Industrial Heavy (Public)	78.0	170	367	790
5	Waterman Av.	n/o Hospitality Ln.	Commercial Regional (Public)	77.3	154	331	713
6	Waterman Av.	s/o Hospitality Ln.	Commercial Regional (Commercial)	79.1	203	438	944
7	Auto Center Rd.	e/o I-215 Fwy.	Commercial General (Commercial)	77.2	150	324	698
8	Orange Show Rd.	e/o E St.	Industrial Light (Commercial/Ind.)	78.3	178	383	826
9	Orange Show Rd.	e/o Arrowhead Av.	Industrial Light (Industrial)	77.2	151	325	700
10	Orange Show Rd.	e/o Washington Av.	Industrial Light (Residential) 77.1		149	322	694
11	Orange Show Rd.	e/o Waterman Av.	Industrial Light (Residential/Ind.)	76.9	143	308	664

¹ Sources: City of San Bernardino General Plan Land Use Element, Figure LU-2 and Google Earth imagery.

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

			Adjacent	CNEL at Nearest	Distance to Contour from Centerline (Feet)		
ID	Road Segment Planned (Existing) Land Use ¹		Adjacent Land Use (dBA) ²	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	
1	Washington Av.	s/o Orange Show Rd.	Industrial Light (Residential)	66.1	RW	36	77
2	Waterman Av.	s/o Orange Show Rd.	Industrial Heavy (Office/Public)	ndustrial Heavy (Office/Public) 77.5		342	738
3	Waterman Av.	s/o Dumas St.	Industrial Heavy (Office/Public) 77.2		151	326	701
4	Waterman Av.	s/o Park Center Dr.	Industrial Heavy (Public)	78.6	186	401	863
5	Waterman Av.	n/o Hospitality Ln.	Commercial Regional (Public)	78.0	170	366	789
6	Waterman Av.	s/o Hospitality Ln.	Commercial Regional (Commercial)	79.5	214	461	993
7	Auto Center Rd.	e/o I-215 Fwy.	Commercial General (Commercial)	77.6	160	345	743
8	Orange Show Rd.	e/o E St.	Industrial Light (Commercial/Ind.)	78.7	191	411	886
9	Orange Show Rd.	e/o Arrowhead Av.	Industrial Light (Industrial)	77.8	165	355	764
10	Orange Show Rd.	e/o Washington Av.	Industrial Light (Residential) 77.2		152	327	704
11	Orange Show Rd.	e/o Waterman Av.	Industrial Light (Residential/Ind.)	76.9	143	309	665

TABLE 7-6: EAC 2018 WITH PROJECT CONDITIONS NOISE CONTOURS

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-7: HORIZON YEAR 2040 WITHOUT PROJECT CONDITIONS NOISE CONTOURS

			Adjacent	CNEL at Nearest	Distance to Contour from Centerline (Feet)		
ID	Road Segment Planned (Existing) Land Use ¹		Adjacent Land Use (dBA) ²	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	
1	Washington Av.	s/o Orange Show Rd.	Industrial Light (Residential)		RW	RW	35
2	Waterman Av.	s/o Orange Show Rd.	Industrial Heavy (Office/Public)	Il Heavy (Office/Public) 77.6		345	743
3	Waterman Av.	s/o Dumas St.	Industrial Heavy (Office/Public) 77		167	359	774
4	Waterman Av.	s/o Park Center Dr.	Industrial Heavy (Public)	78.7	191	412	888
5	Waterman Av.	n/o Hospitality Ln.	Commercial Regional (Public)	78.1	173	372	802
6	Waterman Av.	s/o Hospitality Ln.	Commercial Regional (Commercial)	79.9	230	495	1066
7	Auto Center Rd.	e/o I-215 Fwy.	Commercial General (Commercial)	76.5	136	293	631
8	Orange Show Rd.	e/o E St.	Industrial Light (Commercial/Ind.)	77.4	155	333	718
9	Orange Show Rd.	e/o Arrowhead Av.	Industrial Light (Industrial)	75.8	122	264	569
10	Orange Show Rd.	e/o Washington Av.	Industrial Light (Residential)	77.9	168	361	778
11	Orange Show Rd.	e/o Waterman Av.	Industrial Light (Residential/Ind.)	75.8	121	261	561

¹ Sources: City of San Bernardino General Plan Land Use Element, Figure LU-2 and Google Earth imagery.

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.



			Adjacent	CNEL at Nearest	Distance to Contour from Centerline (Feet)		
ID	Road	Segment Planned (Existing) Land Use ¹		Adjacent Land Use (dBA) ²	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Washington Av.	s/o Orange Show Rd.	Industrial Light (Residential) 6		RW	39	85
2	Waterman Av.	s/o Orange Show Rd.	Industrial Heavy (Office/Public)	avy (Office/Public) 77.7		350	753
3	Waterman Av.	s/o Dumas St.	Industrial Heavy (Office/Public)	ndustrial Heavy (Office/Public) 77.9		364	784
4	Waterman Av.	s/o Park Center Dr.	Industrial Heavy (Public)	79.2	206	444	957
5	Waterman Av.	n/o Hospitality Ln.	Commercial Regional (Public)	78.6	188	406	874
6	Waterman Av.	s/o Hospitality Ln.	Commercial Regional (Commercial)	80.2	240	516	1112
7	Auto Center Rd.	e/o I-215 Fwy.	Commercial General (Commercial)	77.0	146	315	679
8	Orange Show Rd.	e/o E St.	Industrial Light (Commercial/Ind.)	77.9	168	363	781
9	Orange Show Rd.	e/o Arrowhead Av.	Industrial Light (Industrial)	76.6	138	297	639
10	Orange Show Rd.	e/o Washington Av.	Industrial Light (Residential)	78.0	170	366	787
11	Orange Show Rd.	e/o Waterman Av.	Industrial Light (Residential/Ind.)	75.8	121	261	562

TABLE 7-8: HORIZON YEAR 2040 WITH PROJECT CONDITIONS NOISE CONTOURS

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

"RW" = Location of the respective noise contour falls within the right-of-way of the road.

7.2 EXISTING CONDITION PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-1 presents the Existing without Project conditions CNEL noise levels. The Exiting without Project exterior noise levels are expected to range from 55.7 to 78.6 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-2 shows the Existing with Project conditions will range from 65.9 to 79.0 dBA CNEL. As shown on Table 7-9 the Project is expected to generate an exterior noise level increase of up to 10.2 dBA CNEL on one roadway segment: Washington Avenue south of Orange Show Road, which will exceed the significance thresholds for both noise-sensitive and non-noise-sensitive land uses identified in Section 4. Therefore, the off-site Project-related traffic noise level increase is considered a *potentially significant* impact under Existing with Project conditions. It is important to note that the land use adjacent to Washington Avenue south of Orange Show road is designated as Industrial Light use by the City of San Bernardino General Plan Land Use Element, and existing residential homes immediately south of Project access on Washington Avenue represent non-conforming use. However, the Project-related traffic noise level increase due to the addition of Project truck trips on this roadway segment represents a *potentially significant* noise level impact for both noise-sensitive and non-noise-sensitive land uses.

ID	Road	Segment	Adjacent Planned		EL at Adja nd Use (dl		Noise- Sensitive Land Use? ³	Threshold Exceeded? ⁴
			Land Use ¹	No Project	With Project	Project Addition		LACCOULT.
1	Washington Av.	s/o Orange Show Rd.	Industrial Light (Residential)	55.7	65.9	10.2	Yes	Yes
2	Waterman Av.	s/o Orange Show Rd.	Industrial Heavy (Office/Public)	76.7	76.8	0.1	No	No
3	Waterman Av.	s/o Dumas St.	Industrial Heavy (Office/Public)	76.3	76.4	0.1	No	No
4	Waterman Av.	s/o Park Center Dr.	Industrial Heavy (Public)	77.3	78.0	0.7	No	No
5	Waterman Av.	n/o Hospitality Ln.	Commercial Regional (Public)	76.5	77.3	0.8	No	No
6	Waterman Av.	s/o Hospitality Ln.	Commercial Regional (Commercial)	78.6	79.0	0.4	No	No
7	Auto Center Rd.	e/o I-215 Fwy.	Commercial General (Commercial)	76.4	76.9	0.5	No	No
8	Orange Show Rd.	e/o E St.	Industrial Light (Commercial/Ind.)	77.5	78.0	0.5	No	No
9	Orange Show Rd.	e/o Arrowhead Av.	Industrial Light (Industrial)	76.4	77.1	0.7	No	No
10	Orange Show Rd.	e/o Washington Av.	Industrial Light (Residential)	76.4	76.5	0.1	Yes	No
11	Orange Show Rd.	e/o Waterman Av.	Industrial Light (Residential/Ind.)	75.8	75.8	0.0	Yes	No

TABLE 7-9: EXISTING CONDITION OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACTS

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

³ "Yes" = Existing, non-conforming noise-sensitive land uses adjacent to the study area roadway segment.

⁴ Significance Criteria (Section 4).

7.3 EXISTING PLUS AMBIENT (EA) 2018 PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-10 presents a comparison of the EA 2018 without and with Project conditions CNEL noise levels. Table 7-3 shows that the exterior noise levels without accounting for any noise attenuation features are expected to range from 55.7 to 78.8 dBA CNEL without the Project. Table 7-4 presents the EA 2018 with Project conditions noise level contours that are expected to range from 65.9 to 79.1 dBA CNEL. As shown on Table 7-10 the Project is expected to generate an exterior noise level increase of up to 10.2 dBA CNEL on one roadway segment: Washington Avenue south of Orange Show Road, which will exceed the significance thresholds for both noisesensitive and non-noise-sensitive land uses identified in Section 4. Therefore, the off-site Projectrelated traffic noise level increase is considered a *potentially significant* impact under Existing plus Ambient with Project conditions. As previously discussed in Section 7.2, the land use adjacent to Washington Avenue south of Orange Show road is designated as Industrial Light use by the City of San Bernardino General Plan Land Use Element, and existing residential homes immediately south of Project access on Washington Avenue represent non-conforming use. However, the Project-related traffic noise level increase due to the addition of Project truck trips on this roadway segment represents a *potentially significant* noise level impact for both noisesensitive and non-noise-sensitive land uses.

ID	Road	Segment	Adjacent Planned		EL at Adja nd Use (dl		Noise- Sensitive Land Use? ³	Threshold Exceeded? ⁴
			Land Use ¹	No Project	With Project	Project Addition		
1	Washington Av.	s/o Orange Show Rd.	Industrial Light (Residential)	57.7	66.1	8.4	Yes	Yes
2	Waterman Av.	s/o Orange Show Rd.	Industrial Heavy (Office/Public)	77.4	77.5	0.1	No	No
3	Waterman Av.	s/o Dumas St.	Industrial Heavy (Office/Public)	77.1	77.2	0.1	No	No
4	Waterman Av.	s/o Park Center Dr.	Industrial Heavy (Public)	78.0	78.6	0.6	No	No
5	Waterman Av.	n/o Hospitality Ln.	Commercial Regional (Public)	77.3	78.0	0.7	No	No
6	Waterman Av.	s/o Hospitality Ln.	Commercial Regional (Commercial)	79.1	79.5	0.4	No	No
7	Auto Center Rd.	e/o I-215 Fwy.	Commercial General (Commercial)	77.2	77.6	0.4	No	No
8	Orange Show Rd.	e/o E St.	Industrial Light (Commercial/Ind.)	78.3	78.7	0.4	No	No
9	Orange Show Rd.	e/o Arrowhead Av.	Industrial Light (Industrial)	77.2	77.8	0.6	No	No
10	Orange Show Rd.	e/o Washington Av.	Industrial Light (Residential)	77.1	77.2	0.1	Yes	No
11	Orange Show Rd.	e/o Waterman Av.	Industrial Light (Residential/Ind.)	76.9	76.9	0.0	Yes	No

TABLE 7-10: EA 2018 OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACTS

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

³ "Yes" = Existing, non-conforming noise-sensitive land uses adjacent to the study area roadway segment.

⁴ Significance Criteria (Section 4).

7.4 EA PLUS CUMULATIVE (EAC) 2018 PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-11 presents a comparison of the EAC 2018 without and with Project conditions CNEL noise levels. Table 7-5 shows that the exterior noise levels without accounting for any noise attenuation features are expected to range from 57.7 to 79.1 dBA CNEL without the Project. Table 7-6 presents the EAC 2018 with Project conditions noise level contours that are expected to range from 66.1 to 79.5 dBA CNEL. As shown on Table 7-11 the Project is expected to generate an exterior noise level increase of up to 8.4 dBA CNEL on one roadway segment: Washington Avenue south of Orange Show Road, which will exceed the significance thresholds for both noisesensitive and non-noise-sensitive land uses identified in Section 4. Therefore, the off-site Projectrelated traffic noise level increase is considered a *potentially significant* impact under Existing plus Ambient plus Cumulative with Project conditions. As previously discussed, the land use adjacent to Washington Avenue south of Orange Show road is designated as Industrial Light use by the City of San Bernardino General Plan Land Use Element, and existing residential homes immediately south of Project access on Washington Avenue represent non-conforming use. However, the Project-related traffic noise level increase due to the addition of Project truck trips on this roadway segment represents a *potentially significant* noise level impact for both noisesensitive and non-noise-sensitive land uses.

ID	Road	Segment	Adjacent Planned		EL at Adja nd Use (dl		Noise- Sensitive Land Use? ³	Threshold Exceeded? ⁴
			Land Use ¹	No Project	With Project	Project Addition		
1	Washington Av.	s/o Orange Show Rd.	Industrial Light (Residential)	57.7	66.1	8.4	Yes	Yes
2	Waterman Av.	s/o Orange Show Rd.	Industrial Heavy (Office/Public)	77.4	77.5	0.1	No	No
3	Waterman Av.	s/o Dumas St.	Industrial Heavy (Office/Public)	77.1	77.2	0.1	No	No
4	Waterman Av.	s/o Park Center Dr.	Industrial Heavy (Public)	78.0	78.6	0.6	No	No
5	Waterman Av.	n/o Hospitality Ln.	Commercial Regional (Public)	77.3	78.0	0.7	No	No
6	Waterman Av.	s/o Hospitality Ln.	Commercial Regional (Commercial)	79.1	79.5	0.4	No	No
7	Auto Center Rd.	e/o I-215 Fwy.	Commercial General (Commercial)	77.2	77.6	0.4	No	No
8	Orange Show Rd.	e/o E St.	Industrial Light (Commercial/Ind.)	78.3	78.7	0.4	No	No
9	Orange Show Rd.	e/o Arrowhead Av.	Industrial Light (Industrial)	77.2	77.8	0.6	No	No
10	Orange Show Rd.	e/o Washington Av.	Industrial Light (Residential)	77.1	77.2	0.1	Yes	No
11	Orange Show Rd.	e/o Waterman Av.	Industrial Light (Residential/Ind.)	76.9	76.9	0.0	Yes	No

TABLE 7-11: EAC 2018 OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACTS

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

³ "Yes" = Existing, non-conforming noise-sensitive land uses adjacent to the study area roadway segment.

⁴ Significance Criteria (Section 4).

7.5 HORIZON YEAR 2040 PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-12 presents a comparison of the Horizon Year 2040 without and with Project conditions CNEL noise levels. Table 7-7 shows that the exterior noise levels without accounting for any noise attenuation features are expected to range from 61.0 to 79.9 dBA CNEL without the Project. Table 7-8 presents the Horizon Year 2040 with Project conditions noise level contours that are expected to range from 66.8 to 80.2 dBA CNEL. As shown on Table 7-12 the Project is expected to generate an exterior noise level increase of up to 5.8 dBA CNEL on one roadway segment: Washington Avenue south of Orange Show Road, which will exceed the significance thresholds for both noise-sensitive and non-noise-sensitive land uses identified in Section 4. Therefore, the off-site Project-related traffic noise level increase is considered a *potentially significant* impact under Horizon Year with Project conditions. As previously discussed, the land use adjacent to Washington Avenue south of Orange Show road is designated as Industrial Light use by the City of San Bernardino General Plan Land Use Element, and existing residential homes immediately south of Project access on Washington Avenue represent non-conforming use. However, the Project-related traffic noise level increase due to the addition of Project truck trips on this roadway segment represents a *potentially significant* noise level impact for both noise-sensitive and non-noise-sensitive land uses.

ID	Road	Segment	Adjacent Planned Land Use ¹	CNEL at Adjacent Land Use (dBA) ²			Noise- Sensitive Land	Threshold Exceeded? ⁴
				No Project	With Project	Project Addition	Use? ³	Exceducu:
1	Washington Av.	s/o Orange Show Rd.	Industrial Light (Residential)	61.0	66.8	5.8	Yes	Yes
2	Waterman Av.	s/o Orange Show Rd.	Industrial Heavy (Office/Public)	77.6	77.7	0.1	No	No
3	Waterman Av.	s/o Dumas St.	Industrial Heavy (Office/Public)	77.8	77.9	0.1	No	No
4	Waterman Av.	s/o Park Center Dr.	Industrial Heavy (Public)	78.7	79.2	0.5	No	No
5	Waterman Av.	n/o Hospitality Ln.	Commercial Regional (Public)	78.1	78.6	0.5	No	No
6	Waterman Av.	s/o Hospitality Ln.	Commercial Regional (Commercial)	79.9	80.2	0.3	No	No
7	Auto Center Rd.	e/o I-215 Fwy.	Commercial General (Commercial)	76.5	77.0	0.5	No	No
8	Orange Show Rd.	e/o E St.	Industrial Light (Commercial/Ind.)	77.4	77.9	0.5	No	No
9	Orange Show Rd.	e/o Arrowhead Av.	Industrial Light (Industrial)	75.8	76.6	0.8	No	No
10	Orange Show Rd.	e/o Washington Av.	Industrial Light (Residential)	77.9	78.0	0.1	Yes	No
11	Orange Show Rd.	e/o Waterman Av.	Industrial Light (Residential/Ind.)	75.8	75.8	0.0	Yes	No

TABLE 7-12: HORIZON YEAR 2040 OFF-SITE PROJECT-RELATED TRAFFIC NOISE IMPACTS

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

³ "Yes" = Existing, non-conforming noise-sensitive land uses adjacent to the study area roadway segment.

⁴ Significance Criteria (Section 4).

7.6 OFF-SITE TRAFFIC NOISE MITIGATION

To minimize the *potentially significant* Project traffic noise level increases on Washington Avenue south of Orange Show Road, noise mitigation measures were considered in this analysis. These mitigation measures include rubberized asphalt hot mix pavement for the portion of Project access on Washington Avenue south of Orange Show Road, and off-site noise barriers at the existing non-conforming residential lots south of Project access on Washington Avenue. Further, the mitigation measures described below were considered under both interim and permanent access conditions for Project access off Washington Avenue.

7.6.1 RUBBERIZED ASPHALT

In an effort to reduce traffic noise levels at the noise source, Caltrans research has shown that rubberized asphalt can provide noise attenuation of approximately 4 dBA. (24) Therefore, rubberized asphalt was considered as a mitigation measure with the potential to be included in the Project-access roadway improvements associated with Project construction on Washington Avenue. Changing the pavement type of a roadway can reduce the amount of noise produced at the source for both near-term and long-term conditions. This is based on research conducted by Caltrans (24) and the Canadian Ministry of Transportation and Highways (25) which indicates that a 4 dBA reduction in tire/pavement noise is attainable using rubberized asphalt under typical operating conditions. Traffic noise is generated primarily by the interaction of the tires and pavement, the engine, and exhaust systems. For automobiles noise, as much as 75 to 90-percent

of traffic noise is generated by the interaction of the tires and pavement, especially when traveling at higher and constant speeds. (6)

However, the effectiveness of reducing traffic noise levels is higher on roadways with low percentages of heavy trucks, since heavy truck engine and exhaust noise is not affected by rubberized alternative pavement. (24) This is due to the truck height or the height at which truck engines and exhaust systems sit above the pavement. Per Caltrans guidance, noise barriers are required to break the line-of-sight using a truck stack height of 11.5 feet above the road. (8) (26) With the primary off-site traffic noise source representing heavy trucks with a stack height of 11.5 feet off the ground, the tire/pavement noise reduction benefits associated rubberized asphalt will be limited and are not expected to provide a meaningful noise reduction.

While the rubberized asphalt paving off-site traffic noise mitigation measure could provide a noise reduction of roughly 4 dBA for autos traveling at higher speeds, the benefit of rubberized asphalt for noise produced by higher truck stack noise sources is not expected to *substantially* reduce (12 dBA Leq or more per Caltrans *Traffic Noise Analysis Protocol* (2)) or eliminate the impacts. Therefore, off-site Project-related traffic noise level increases at adjacent land uses under all scenarios would remain *potentially significant* with or without the rubberized asphalt mitigation considered in this analysis.

7.6.2 OFF-SITE NOISE BARRIERS

Existing noise-sensitive residential homes are located on the eastern side of Washington Avenue south of Orange Show Road, and therefore, off-site noise barriers are considered in this analysis as potential mitigation to reduce the impacts at the noise-sensitive land uses closest to the heavy truck traffic accessing the Project site. Off-site noise barriers are estimated to provide a *readily perceptible* 5 dBA reduction which, according to the FHWA, is *simple* to attain when blocking the line-of-sight from the noise source to the receiver. (8) This 5 dBA of noise barrier attenuation is also identified by Caltrans as the minimum required noise attenuation to justify the construction of a noise barrier. (26)

As previously discussed, Caltrans guidance requires an 11.5 foot high truck stack height representing truck engine and exhaust noise to evaluate heavy truck traffic noise levels. Therefore, any exterior noise barriers at residential homes experiencing Project-related traffic noise level increases would need to be high enough and long enough to block the line-of-sight from the noise source (at 11.5 feet high per Caltrans) to the receiver (at 5 feet high per FHWA guidance). (8; 26) This would result in the need for a minimum 8-foot high noise barrier on Washington Avenue. However, Project-related traffic noise level increases were previously shown to approach 10.2 dBA CNEL under Existing with Project conditions, and therefore, the off-site traffic noise barriers are not expected to *substantially* reduce (12 dBA Leq or more per Caltrans *Traffic Noise Analysis Protocol* (2)) or eliminate the impacts.



Further, FHWA guidance indicates that the front yards of the residential homes on Washington Avenue south of Orange Show Road do not represent outdoor living areas of frequent human use (e.g., backyards of single-family homes). (8) Therefore, exterior noise mitigation in the form of noise barriers on Washington Avenue is not required per FHWA guidance. In addition, the estimated minimum 8-foot high noise barrier will not provide a *substantial* reduction (12 dBA Leq or more per Caltrans *Traffic Noise Analysis Protocol* (2)) or eliminate the off-site Project traffic noise impacts.

7.6.3 SIGNIFICANT OFF-SITE TRAFFIC NOISE IMPACTS

Both rubberized asphalt and off-site noise barriers were considered as potential noise mitigation measures to reduce the Project-related off-site traffic noise level increases under all with Project scenarios, previously shown on Tables 7-9 to 7-12. However, neither form of potential mitigation would eliminate or *substantially* (12 dBA Leq or more per Caltrans *Traffic Noise Analysis Protocol* (2)) reduce the off-site traffic noise level increases associated with Project truck trips on either the interim or permanent Project access conditions for Washington Avenue south of Orange Show Road. Therefore, the Project-related traffic noise level increases will remain as *significant* impacts, since the off-site traffic noise mitigation measures considered in this analysis would not substantially reduce or eliminate the impacts.

This off-site traffic noise analysis evaluated 11 study area roadway segments based on the without and with Project traffic noise levels. As indicated above, only one segment of the 11, Washington Avenue south of Orange Show Road, will experience a *significant* off-site traffic noise level impact under with Project conditions. Further, the noise-sensitive residential homes on the impacted roadway segment represent existing non-conforming uses which are designated as Industrial Light land use, and are expected, under long range General Plan buildout conditions, to be redeveloped as industrial, non-noise sensitive land use.

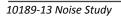


8 **RECEIVER LOCATIONS**

To assess the potential for long-term operational and short-term construction noise impacts, the following seven receiver locations, as shown on Exhibit 8-A, were identified as representative locations for analysis. Sensitive receivers are generally defined as locations where people reside or where the presence of unwanted sound could otherwise adversely affect the use of the land. Noise-sensitive land uses are generally considered to include: schools, hospitals, single-family dwellings, mobile home parks, churches, libraries, and recreation areas. Moderately noise-sensitive land uses typically include: multi-family dwellings, hotels, motels, dormitories, outpatient clinics, cemeteries, golf courses, country clubs, athletic/tennis clubs, and equestrian clubs. Land uses that are considered relatively insensitive to noise include business, commercial, and professional developments. Land uses that are typically not affected by noise include: industrial, manufacturing, utilities, agriculture, natural open space, undeveloped land, parking lots, warehousing, liquid and solid waste facilities, salvage yards, and transit terminals.

Representative sensitive receivers near the Project site include the single-family residential home at location R1, the church uses at locations R2 and R3, and the Santa Ana River at location R5. Location R4 represents the closest business office use, and location R6 represents nearby hotel use south of the Project site. The closest sensitive receiver is represented by location R1 where an existing residential home is located approximately 218 feet east of the Project site boundary. Other sensitive land uses in the Project study area that are located at greater distances than those identified in this noise study will experience lower noise levels than those presented in this report due to the additional attenuation from distance and the shielding of intervening structures.

- R1: Located roughly 140 feet southeast of the Project site on Washington Avenue, R1 represents the existing residential homes near proposed Project site access.
- R2: Located approximately 218 feet east of the Project site on Dumas Street, R2 represents the existing residential homes closest to the Project site. Under permanent site access Option 1, this receiver location would be replaced with the extension of Washington Avenue south to the Project site.
- R3: Location R3 represents existing church located roughly 292 feet north of the Project site on Dumas Street. A long-term noise measurement was taken near this location, L4, to describe the existing ambient noise environment.
- R4: Location R4 represents the existing church situated north of the Project site at approximately 585 feet on Dumas Street. A long-term noise measurement was taken near this location, L3, to describe the existing ambient noise environment.
- R5: Location R5 represents the existing Inland Regional Center at approximately 228 feet east of the Project site across Waterman Avenue. A long-term noise measurement was taken near this location, L5, to describe the existing ambient noise environment.





- R6: Location R6 represents the Santa Ana River area located south of the Project site at approximately 245 feet. A long-term noise measurement was taken near this location, L6, to describe the existing ambient noise environment.
- R7: Location R7 represents the existing Quality Inn situated approximately 911 feet south of the Project site on Waterman Avenue. A long-term noise measurement was taken near this location, L7, to describe the existing ambient noise environment.



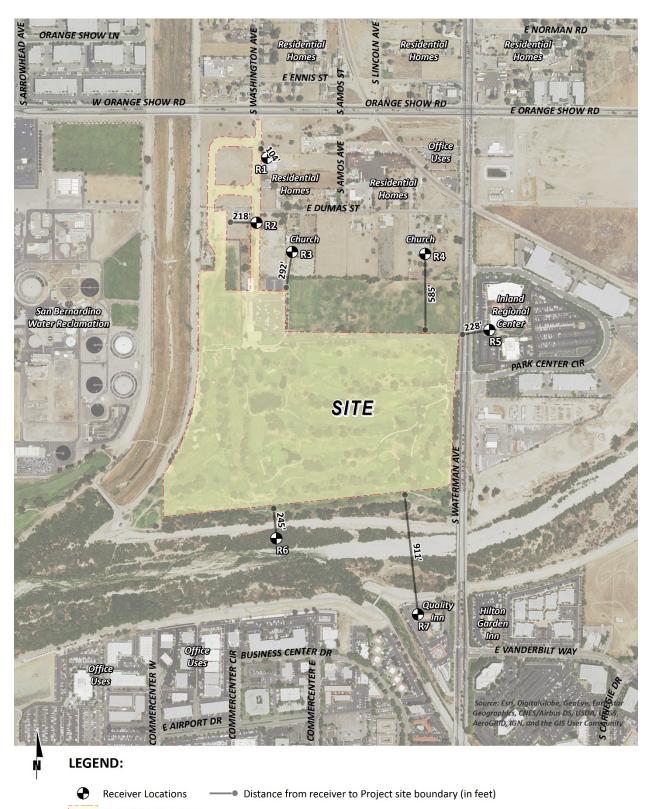


EXHIBIT 8-A: RECEIVER LOCATIONS

Project Site Boundary



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9 OPERATIONAL NOISE IMPACTS

This section analyzes the potential stationary-source operational noise impacts at the nearby receiver locations, identified in Section 8, resulting from operation of the proposed Gateway South Building 4 Project. Exhibit 9-A identifies the representative receiver locations and noise source locations used to assess the operational noise levels.

9.1 OPERATIONAL NOISE STANDARDS

To analyze noise impacts originating from a designated fixed location or private property such as the Gateway South Building 4 Project, operational source noise is typically evaluated against standards established under a City's Municipal Code. While the City of San Bernardino maintains several policies in the Municipal Code Noise Control Ordinance to control the negative effects of nuisance noise, it does not identify specific exterior noise level limits. However, the policies in the Municipal Code Development Code, Chapter 19.20, *Property Development Standards* contain the exterior and interior noise level standards for residential land uses. Therefore, the stationary noise sources such as idling trucks, delivery truck activities, parking, backup alarms, as well as loading and unloading of dry goods originating from a designated fixed location or private property such as the Gateway South Building 4 site, are evaluated against the policies adopted in the City's Development Code. (5)

The Project operational noise impacts are governed by the City of San Bernardino Municipal Code, Section 8.54, included in Appendix 3.2. Section 8.54.060 states when: *such noises are an accompaniment and effect of a lawful business, commercial or industrial enterprise carried on in an area zoned for that purpose*...these activities shall be exempt (Section 8.54.060(B)). (16) However, due to the Project's close proximity to residential land uses, located north of the Project site boundary, Development Code, Section 19.20.030.15(A), limits the operational stationary-source noise from the Gateway South Building 4 Project to an exterior noise level of 65 dBA Leq for residential land use. (5)

9.2 OPERATIONAL NOISE SOURCES

At the time this noise analysis was prepared the future tenants of the proposed Project were unknown. To present the potential worst-case noise conditions, this analysis assumes the Project would be operational 24 hours per day, seven days per week. The Project business operations would primarily be conducted within the enclosed buildings, except for traffic movement, parking, as well as loading and unloading of trucks at designated loading bays. The on-site Project-related noise sources are expected to include: idling trucks, delivery truck activities, parking, backup alarms, as well as loading and unloading of dry goods. This noise analysis is intended to describe noise level impacts associated with the expected typical warehouse and distribution storage activities at the Project site. As part of the Project's design, all on-site outdoor cargo handling equipment (CHE) (including yard trucks, hostlers, yard goats, pallet jacks, forklifts, and other on-site equipment) will be powered by non-diesel fueled engines and all on-site indoor forklifts shall be powered by electricity, compressed natural gas, or propane.



9.3 REFERENCE NOISE LEVELS

Since the future tenants of the proposed Project are unknown, the Project's operational noise levels were estimated based on reference noise level measurements of similar operational activities. The reference noise levels are intended to describe the expected operational noise sources that may include idling trucks, delivery truck activities, parking, backup alarms, as well as loading and unloading of dry goods. To estimate the Project off-site operational noise impacts associated with the Gateway South Building 4, the following reference noise level measurements were collected from existing logistics warehouse operations containing similar operational noise sources, as shown on Table 9-1. Appendix 9.1 includes reference noise source photos.

9.3.1 MOTIVATIONAL FULFILLMENT & LOGISTICS SERVICES DISTRIBUTION FACILITY (DRY GOODS)

Short-term reference noise level measurements were collected on Wednesday, January 7th, 2015, by Urban Crossroads, Inc. at the Motivational Fulfillment & Logistics Services distribution facility located at 6810 Bickmore Avenue in the City of Chino. The noise level measurements represent the typical weekday dry goods logistics warehouse operation in a single building with a loading dock area on the western side of the building façade. Two reference noise level measurements were taken at this location, including entry gate activity and unloading/docking activity noise sources. Up to ten trucks were observed in the loading dock area including a combination of track trailer semi-trucks, two-axle delivery trucks, and background forklift operations.

ENTRY GATE ACTIVITY

The entry gate activity noise level measurement was taken at the southern entry gate over a fifteen-minute period and represents multiple noise sources producing a reference noise level of 56.0 dBA Leq at a uniform distance of 50 feet. The noise sources included at this measurement location account for the rattling and squeaking during normal opening and closing operations, the gate closure equipment, truck engines idling outside the entry gate, and background forklift backup alarm noise.

UNLOADING/DOCKING ACTIVITY

The unloading/docking activity noise level measurement was taken over a fifteen-minute period and represents multiple noise sources taken from the center of loading dock activities generating a reference noise level of 62.8 dBA Leq at a uniform distance of 50 feet. At this measurement location, the noise sources associated with employees unloading a docked truck container included the squeaking of the truck's shocks when weight was removed from the truck, employees playing music over a radio, as well as a forklift horn and backup alarm. In addition, during the noise level measurement a truck entered the loading dock area and proceeded to reverse and dock in a nearby loading bay, adding truck engine and air brakes noise.



9.3.2 WORST-CASE REFERENCE NOISE LEVELS

To describe the worst-case Project-only operational noise levels associated with the Gateway South Building 4 Project, this analysis relies on a reference noise level of 62.8 dBA Leq at a uniform distance of 50 feet representing unloading/docking activity taken at the Motivational Fulfillment & Logistics Services distribution facility, previously described in Section 9.3.1. This analysis assumes that tenants within the Project buildings would be operational 24 hours per day, seven days per week. As shown on Table 9-1, the reference noise level of 62.8 dBA at a uniform distance of 50 feet has a noise-source height of 8 feet. While the specific noise levels at the Project site will depend on the actual tenant, the intensity and the daytime / nighttime hours of operation, a reference noise level of 62.8 dBA Leq at a normalized distance of 50 feet is used to describe the peak Project operational noise activity since it represents similar operational characteristics. The reference noise levels are intended to describe noise level impacts associated with the expected typical warehouse and distribution storage operations at the Project site.

	Duration	Distance	Noise	Hourly	Noise Level (dBA Leq)	
Noise Source	Duration (h:mm:ss)	From Source (Feet)	Source Height (Feet)	Activity (Minutes) ³	@ Ref. Distance	@ 50 Feet
Entry Gate Activity ¹	0:15:00	20'	8'	60	64.0	56.0
Unloading/Docking Activity ¹	0:15:00	30'	8'	60	67.2	62.8
Roof-Top Air Conditioning Units ²	96:00:00	5'	25'	39	77.2	57.2

TABLE 9-1: REFERENCE NOISE LEVEL MEASUREMENTS

¹ Reference noise level measurements were collected on 1/7/2015 from the existing operations of the Motivational Fulfillment & Logistics Services distribution facility located at 6810 Bickmore Avenue in the City of Chino.

² As measured by Urban Crossroads, Inc. on 7/27/2015 at the Santee Walmart located at 170 Town Center Parkway.

³ Duration (minutes within the hour) of noise activity during peak hourly conditions.

9.4 PROJECT OPERATIONAL NOISE LEVELS

Using the reference noise levels to represent the proposed warehouse operations that include idling trucks, delivery truck activities, parking, backup alarms, as well as loading and unloading of dry goods, Urban Crossroads, Inc. calculated the operational source noise levels that are expected to be generated at the Project site and the Project-related noise level increases that would be experienced at each of the sensitive receiver locations. The operational noise level calculations, shown on Table 9-2, account for the distance attenuation provided due to geometric spreading when sound from a localized stationary source (i.e., a point source) propagates uniformly outward in a spherical pattern. With geometric spreading, sound levels attenuate (or decrease) at a rate of 6 dB for each doubling of distance from a point source (e.g. idling trucks, delivery truck activities, parking, backup alarms, loading and unloading of dry goods) under the hard site conditions used in this analysis.



Table 9-2 presents the unmitigated Project operational noise levels based on the distances from the closest noise source to each nearby sensitive receiver location, as shown on Exhibit 9-A. Table 9-2 indicates that the noise levels associated with the Gateway South Building 4 Project are expected to range from 36.9 to 48.2 dBA Leq at the nearby sensitive receiver locations. Based on the results of the noise analysis, the Project operational noise levels will satisfy the City of San Bernardino 65 dBA Leq exterior noise level standards at the nearby sensitive receiver locations as shown on Table 9-3, and therefore, the operational noise impacts will be *less than significant*. The operational noise level calculations are included in Appendix 9.2.

	Noise S	Combined	
Receiver Location ¹	Unloading/ Docking Activity	Roof-Top Air Conditioning Unit	Operational Noise Levels (dBA Leq) ³
R1	36.6	24.6	36.9
R2	42.3	27.5	42.4
R3	45.8	29.4	45.9
R4	39.2	30.2	39.7
R5	39.7	33.0	40.5
R6	48.0	35.3	48.2
R7	37.4	28.2	37.9

TABLE 9-2: PROJECT OPERATIONAL NOISE LEVEL PROJECTIONS

¹ See Exhibit 9-A for the receiver and noise source locations.

² Reference noise sources as shown on Table 9-1.

³ Calculations for each noise source are provided in Appendix 9.2.

Receiver Location ¹	Noise Level At Receiver Locations (dBA Leq) ²	Noise Level Standard (dBA Leq) ³	Threshold Exceeded? ⁴
R1	36.9	65	No
R2	42.4	65	No
R3	45.9	65	No
R4	39.7	65	No
R5	40.5	65	No
R6	48.2	65	No
R6	37.9	65	No

TABLE 9-3: PROJECT OPERATIONAL NOISE LEVEL COMPLIANCE

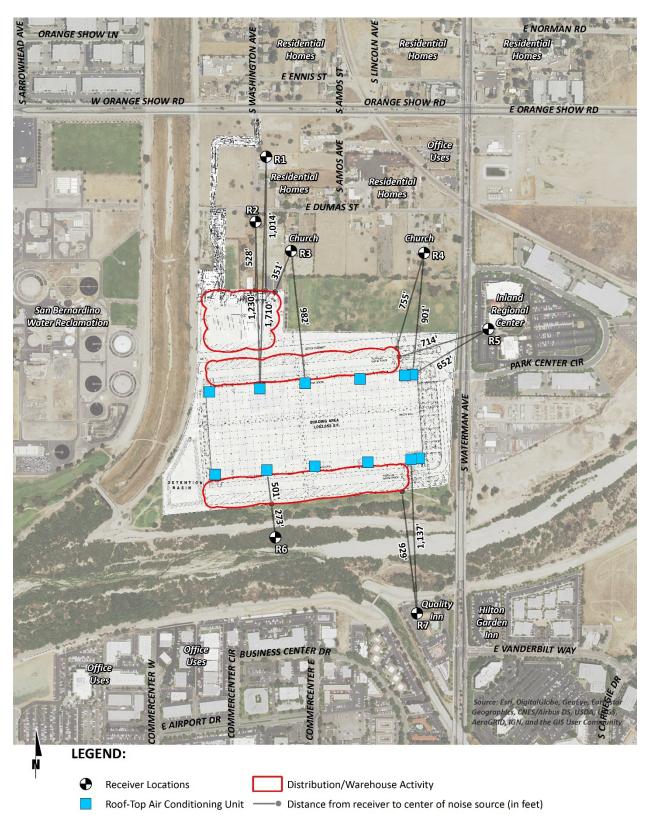
¹ See Exhibit 9-A for the noise receiver and noise source locations.

² Estimated Project stationary source noise levels as shown on Table 9-2.

³ Noise standards as shown on Table 3-1.

⁴ Do the estimated Project stationary source noise levels exceed the noise standards on the affected land uses?









9.5 PROJECT OPERATIONAL NOISE CONTRIBUTION

To describe the Project operational noise level contributions, the Project operational noise levels are combined with the existing ambient noise levels measurements for the nearby receiver locations potentially impacted by Project operational noise sources. Since the units used to measure noise, decibels (dB), are logarithmic units, the Project-operational and existing ambient noise levels cannot be combined using standard arithmetic equations. (6) Instead, they must be logarithmically added using the following base equation:

 $SPL_{Total} = 10log_{10}[10^{SPL1/10} + 10^{SPL2/10} + \dots 10^{SPLn/10}]$

Where "SPL1," "SPL2," etc. are equal to the sound pressure levels being combined, or in this case, the Project-operational and existing ambient noise levels. The difference between the combined Project and ambient noise levels describe the Project noise level contributions to the existing ambient noise environment. Noise levels that would be experienced at receiver locations when Project-source noise is added to the ambient daytime and nighttime conditions are presented on Tables 9-4 and 9-5.

As indicated on Table 9-4, the highest Project-related daytime operational noise level increase will approach 1.2 dBA Leq. During the nighttime hours, the highest Project-related noise level increase will approach 1.6 dBA Leq, as shown on Table 9-5. Since the Project-related operational noise level contributions will not exceed the significance criteria discussed in Section 4, the increases at the sensitive receiver locations will be *less than significant*. On this basis, Project operational stationary-source noise would not result in a substantial temporary/periodic, or permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project, and impacts in these regards will be *less than significant*.

Receiver Location ¹	Total Project Operational Noise Level ²	Measurement Location ³	Reference Ambient Noise Levels ⁴	Combined Project and Ambient ⁵	Project Contribution ⁶	Threshold Exceeded? ⁷
R1	36.9	L2	54.9	55.0	0.1	No
R2	42.4	L4	51.4	51.9	0.5	No
R3	45.9	L4	52.3	53.2	0.9	No
R4	39.7	L3	60.9	60.9	0.0	No
R5	40.5	L5	62.5	62.5	0.0	No
R6	48.2	L6	53.1	54.3	1.2	No
R7	37.9	L7	52.3	52.5	0.2	No

¹ See Exhibit 9-A for the sensitive receiver locations.

² Total Project operational noise levels as shown on Table 9-3.

³ Reference noise level measurement locations as shown on Exhibit 5-A.

⁴ Observed daytime ambient noise levels as shown on Table 5-1.

 $^{\scriptscriptstyle 5}$ Represents the combined ambient conditions plus the Project activities.

⁶ The noise level increase expected with the addition of the proposed Project activities.

⁷ Significance Criteria as defined in Section 4.

Receiver Location ¹	Total Project Operational Noise Level ²	Measurement Location ³	Reference Ambient Noise Levels ⁴	Combined Project and Ambient ⁵	Project Contribution ⁶	Threshold Exceeded? ⁷
R1	36.9	L2	54.9	55.0	0.1	No
R2	42.4	L4	51.4	51.9	0.5	No
R3	45.9	L4	51.4	52.5	1.1	No
R4	39.7	L3	58.9	59.0	0.1	No
R5	40.5	L5	61.2	61.2	0.0	No
R6	48.2	L6	51.8	53.4	1.6	No
R7	37.9	L7	50.2	50.4	0.2	No

TABLE 9-5: PROJECT NIGHTTIME NOISE LEVEL CONTRIBUTIONS

¹ See Exhibit 9-A for the sensitive receiver locations.

² Total Project operational noise levels as shown on Table 9-3.

³ Reference noise level measurement locations as shown on Exhibit 5-A.

⁴ Observed nighttime ambient noise levels as shown on Table 5-1.

⁵ Represents the combined ambient conditions plus the Project activities.

⁶ The noise level increase expected with the addition of the proposed Project activities.

⁷ Significance Criteria as defined in Section 4.

9.6 **OPERATIONAL NOISE ABATEMENT MEASURES**

To further reduce potential operational noise levels received at nearby noise-sensitive receiver locations, it is recommended that the Lead Agency require the following as Project Conditions of Approval:

- All on-site operating equipment under the control of the building user that is used in outdoor areas shall be equipped with properly functioning and well-maintained mufflers.
- Maintain quality pavement conditions on the property that are free of vertical deflection (i.e. speed bumps) to minimize truck noise.
- The truck access gates and loading docks within the truck court on the Project site shall be posted with signs which state:
 - o Truck drivers shall turn off engines when not in use;
 - Diesel trucks servicing the Project shall not idle for more than five (5) minutes; and
 - Post telephone numbers of the building facilities manager to report idling violations.



9.7 OPERATIONAL VIBRATION IMPACTS

To assess the potential vibration impacts from truck haul trips associated with operational activities, the City of San Bernardino threshold for vibration of 0.7 in/sec (RMS) is used. Truck vibration levels are dependent on vehicle characteristics, load, speed, and pavement conditions. Typical vibration levels for the Gateway South Building 4 heavy truck activity at normal traffic speeds will approach 0.001 in/sec (RMS), based on the FTA *Transit Noise Impact and Vibration Assessment*. Truck deliveries transiting on site will be travelling at very low speeds so it is expected that delivery truck vibration impacts at nearby homes will not exceed the vibration threshold of 0.7 in/sec (RMS), and therefore, will be *less than significant*.



10 CONSTRUCTION IMPACTS

This section analyzes potential impacts resulting from the short-term construction activities associated with the development of the Project. Exhibit 10-A shows the construction noise source locations in relation to the nearby sensitive receiver locations previously described in Section 8. In addition, the construction noise analysis is based on the closest distance to construction activities across all potential Project site access alternatives (interim and permanent Options 1 and 2) to present a conservative approach.

10.1 CONSTRUCTION NOISE STANDARDS

The City of San Bernardino has set restrictions to control noise impacts associated with the construction of the proposed Project. Section 8.54.070 of the City's Noise Control Ordinance states: No person shall be engaged or employed, or cause any other person to be engaged or employed, in any work of construction, erection, alteration, repair, addition, movement, demolition, or improvement to any building or structure except within the hours of 7:00 a.m. and 8:00 p.m. (16) While the City establishes limits to the hours during which construction activity may take place, it does not identify specific noise level limits for construction noise levels.

To evaluate whether the Project will generate a substantial periodic increase in short-term noise levels at off-site sensitive receiver locations, a construction-related noise level threshold is adopted from the Criteria for Recommended Standard: Occupational Noise Exposure prepared by the National Institute for Occupational Safety and Health (NIOSH). (3) A division of the U.S. Department of Health and Human Services, NIOSH identifies a noise level threshold based on the duration of exposure to the source. The construction related noise level threshold starts at 85 dBA for more than eight hours per day, and for every 3 dBA increase, the exposure time is cut in half. This results in noise level thresholds of 88 dBA for more than four hours per day, 92 dBA for more than one hour per day, 96 dBA for more than 30 minutes per day, and up to 100 dBA for more than 15 minutes per day. (3) For the purposes of this analysis, the lowest, more conservative construction noise level threshold of 85 dBA Leg is used as an acceptable threshold for construction noise at the nearby sensitive receiver locations. Since this construction-related noise level threshold represents the energy average of the noise source over a given time period, they are expressed as Leg noise levels. Therefore, the noise level threshold of 85 dBA Leg over a period of eight hours or more is used to evaluate the potential Project-related construction noise level impacts at the nearby sensitive receiver locations.

10.2 CONSTRUCTION NOISE LEVELS

Noise generated by the Project construction equipment will include a combination of trucks, power tools, concrete mixers, and portable generators that when combined can reach high levels. The number and mix of construction equipment is expected to occur in the following stages:

- Site Preparation
- Grading



- Building Construction
- Paving
- Architectural Coating

This construction noise analysis was prepared using reference noise level measurements taken by Urban Crossroads, Inc. to describe the typical construction activity noise levels for each stage of Project construction. The construction reference noise level measurements represent a list of typical construction activity noise levels. Noise levels generated by heavy construction equipment can range from approximately 68 dBA to in excess of 80 dBA when measured at 50 feet. However, these noise levels diminish with distance from the construction site at a rate of 6 dBA per doubling of distance. For example, a noise level of 80 dBA measured at 50 feet from the noise source to the receiver would be reduced to 74 dBA at 100 feet from the source to the receiver, and would be further reduced to 68 dBA at 200 feet from the source to the receiver. The construction stages used in this analysis are consistent with the *Gateway South Building 4 Air Quality Impact Analysis* prepared by Urban Crossroads, Inc. (27)

10.3 CONSTRUCTION REFERENCE NOISE LEVELS

To describe the Project construction noise levels, measurements were collected for similar activities at several construction sites. Table 10-1 provides a summary of the 16-construction reference noise level measurements. Since the reference noise levels were collected at varying distances of 30 feet and 50 feet, all construction noise level measurements presented on Table 10-1 have been adjusted for consistency to describe a common reference distance of 50 feet.



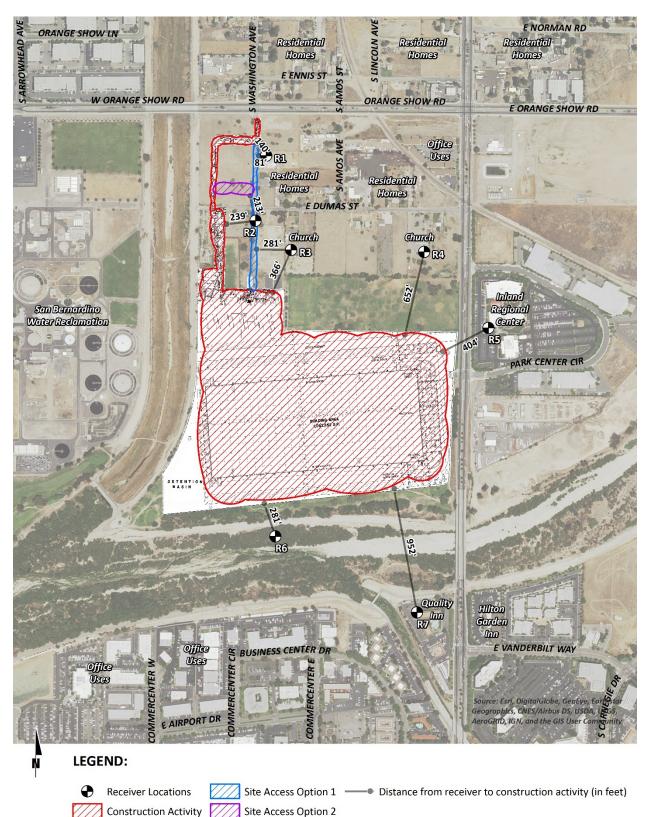


EXHIBIT 10-A: CONSTRUCTION NOISE SOURCE AND RECEIVER LOCATIONS



ID	Noise Source	Reference Distance From Source (Feet)	Reference Noise Levels @ Reference Distance (dBA Leq)	Reference Noise Levels @ 50 Feet (dBA Leq) ⁶
1	Truck Pass-Bys & Dozer Activity ¹	30'	63.6	59.2
2	Dozer Activity ¹	30'	68.6	64.2
3	Construction Vehicle Maintenance Activities ²	30'	71.9	67.5
4	Foundation Trenching ²	30'	72.6	68.2
5	Rough Grading Activities ²	30'	77.9	73.5
6	Residential Framing ³	30'	66.7	62.3
7	Water Truck Pass-By & Backup Alarm ⁴	30'	76.3	71.9
8	Dozer Pass-By ⁴	30'	84.0	79.6
9	Two Scrapers & Water Truck Pass-By ⁴	30'	83.4	79.0
10	Two Scrapers Pass-By ⁴	30'	83.7	79.3
11	Scraper, Water Truck, & Dozer Activity ⁴	30'	79.7	75.3
12	Concrete Mixer Truck Movements ⁵	50'	71.2	71.2
13	Concrete Paver Activities ⁵	30'	70.0	65.6
14	Concrete Mixer Pour & Paving Activities ⁵	30'	70.3	65.9
15	Concrete Mixer Backup Alarms & Air Brakes ⁵	50'	71.6	71.6
16	Concrete Mixer Pour Activities ⁵	50'	67.7	67.7

TABLE 10-1:	CONSTRUCTION REFERENCE NOISE LEVELS
--------------------	-------------------------------------

¹ As measured by Urban Crossroads, Inc. on 10/14/15 at a business park construction site located at the northwest corner of Barranca Parkway and Alton Parkway in the City of Irvine.

² As measured by Urban Crossroads, Inc. on 10/20/15 at a construction site located in Rancho Mission Viejo.

³ As measured by Urban Crossroads, Inc. on 10/20/15 at a residential construction site located in Rancho Mission Viejo.

⁴ As measured by Urban Crossroads, Inc. on 10/30/15 during grading operations within an industrial construction site located in the City of Ontario.

⁵ Reference noise level measurements were collected from a nighttime concrete pour at an industrial construction site, located at 27334 San Bernardino Avenue in the City of Redlands, between 1:00 a.m. to 2:00 a.m. on 7/1/15.

⁶ Reference noise levels are calculated at 50 feet using a drop off rate of 6 dBA per doubling of distance (point source).



10.4 CONSTRUCTION NOISE ANALYSIS

Tables 10-2 to 10-6 show the Project construction stages and the reference construction noise levels used for each stage. Table 10-7 provides a summary of the noise levels from each stage of construction at each of the sensitive receiver locations. Based on the reference construction noise levels, the Project-related construction noise levels when the peak reference noise level is operating at the closest point within the center of construction activity to the nearest the sensitive receiver location \$\vec{54.0}\$ to \$\vec{75.4}\$ dBA Leq.

Reference Construction Activity ¹	Reference Noise Level @ 50 Feet (dBA Leq)
Truck Pass-Bys & Dozer Activity	59.2
Water Truck Pass-By & Backup Alarm	71.9
Dozer Pass-By	79.6
Two Scrapers & Water Truck Pass-By	79.0
Two Scrapers Pass-By	79.3
Peak Reference Noise Level at 50 Feet (dBA Leq):	79.6

TABLE 10-2: SITE PREPARATION EQUIPMENT NOISE LEVELS

Receiver Location	Distance To Construction Activity (Feet) ²	Distance Attenuation (dBA Leq) ³	Estimated Noise Barrier Attenuation (dBA Leq) ⁴	Construction Noise Level (dBA Leq)
R1	81'	-4.2	0.0	75.4
R2	213'	-12.6	0.0	67.0
R3	281'	-15.0	0.0	64.6
R4	652'	-22.3	0.0	57.3
R5	404'	-18.1	0.0	61.4
R6	952'	-25.6	0.0	54.0
R7	281'	-15.0	0.0	64.6

 $^{\rm 1}$ Reference construction noise level measurements taken by Urban Crossroads, Inc.

 $^{\rm 2}$ Distance from the nearest point of construction activity to the nearest receiver.

 $^{\rm 3}$ Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.



Reference Construction Activity ¹	Reference Noise Level @ 50 Feet (dBA Leq)
Truck Pass-Bys & Dozer Activity	59.2
Dozer Activity	64.2
Rough Grading Activities	73.5
Dozer Pass-By	79.6
Two Scrapers & Water Truck Pass-By	79.0
Two Scrapers Pass-By	79.3
Peak Reference Noise Level at 50 Feet (dBA Leq):	79.6

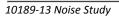
TABLE 10-3: GRADING EQUIPMENT NOISE LEVELS

Receiver Location	Distance To Construction Activity (Feet) ²	Distance Attenuation (dBA Leq) ³	Estimated Noise Barrier Attenuation (dBA Leq) ⁴	Construction Noise Level (dBA Leq)
R1	81'	-4.2	0.0	75.4
R2	213'	-12.6	0.0	67.0
R3	281'	-15.0	0.0	64.6
R4	652'	-22.3	0.0	57.3
R5	404'	-18.1	0.0	61.4
R6	952'	-25.6	0.0	54.0
R7	281'	-15.0	0.0	64.6

¹ Reference construction noise level measurements taken by Urban Crossroads, Inc.

 $^{\rm 2}$ Distance from the nearest point of construction activity to the nearest receiver.

³ Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.



Reference Construction Activity ¹	Reference Noise Level @ 50 Feet (dBA Leq)
Truck Pass-Bys & Dozer Activity	59.2
Dozer Activity	64.2
Foundation Trenching	68.2
Water Truck Pass-By & Backup Alarm	71.9
Peak Reference Noise Level at 50 Feet (dBA Leq):	71.9

TABLE 10-4: BUILDING CONSTRUCTION EQUIPMENT NOISE LEVELS

Receiver Location	Distance To Construction Activity (Feet) ²	Distance Attenuation (dBA Leq) ³	Estimated Noise Barrier Attenuation (dBA Leq) ⁴	Construction Noise Level (dBA Leq)
R1	81'	-4.2	0.0	67.7
R2	213'	-12.6	0.0	59.3
R3	281'	-15.0	0.0	56.9
R4	652'	-22.3	0.0	49.6
R5	404'	-18.1	0.0	53.7
R6	952'	-25.6	0.0	46.3
R7	281'	-15.0	0.0	56.9

¹ Reference construction noise level measurements taken by Urban Crossroads, Inc.

 $^{\rm 2}$ Distance from the nearest point of construction activity to the nearest receiver.

 $^{\rm 3}$ Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.



Reference Construction Activity ¹	Reference Noise Level @ 50 Feet (dBA Leq)
Concrete Mixer Truck Movements	71.2
Concrete Paver Activities	65.6
Concrete Mixer Pour & Paving Activities	65.9
Concrete Mixer Backup Alarms & Air Brakes	71.6
Concrete Mixer Pour Activities	67.7
Peak Reference Noise Level at 50 Feet (dBA Leq):	71.6

TABLE 10-5: PAVING EQUIPMENT NOISE LEVELS

Receiver Location	Distance To Construction Activity (Feet) ²	Distance Attenuation (dBA Leq) ³	Estimated Noise Barrier Attenuation (dBA Leq) ⁴	Construction Noise Level (dBA Leq)
R1	81'	-4.2	0.0	67.4
R2	213'	-12.6	0.0	59.0
R3	281'	-15.0	0.0	56.6
R4	652'	-22.3	0.0	49.3
R5	404'	-18.1	0.0	53.5
R6	952'	-25.6	0.0	46.0
R7	281'	-15.0	0.0	56.6

¹ Reference construction noise level measurements taken by Urban Crossroads, Inc.

² Distance from the nearest point of construction activity to the nearest receiver.

³ Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.



Reference Construction Activity ¹	Reference Noise Level @ 50 Feet (dBA Leq)
Construction Vehicle Maintenance Activities	67.5
Peak Reference Noise Level at 50 Feet (dBA Leq):	67.5

TABLE 10-6: ARCHITECTURAL COATING EQUIPMENT NOISE LEVELS
--

Receiver Location	Distance To Construction Activity (Feet) ²	Distance Attenuation (dBA Leq) ³	Estimated Noise Barrier Attenuation (dBA Leq) ⁴	Construction Noise Level (dBA Leq)
R1	81'	-4.2	0.0	63.3
R2	213'	-12.6	0.0	54.9
R3	281'	-15.0	0.0	52.5
R4	652'	-22.3	0.0	45.2
R5	404'	-18.1	0.0	49.3
R6	952'	-25.6	0.0	41.9
R7	281'	-15.0	0.0	52.5

¹ Reference construction noise level measurements taken by Urban Crossroads, Inc.

 $^{\rm 2}$ Distance from the nearest point of construction activity to the nearest receiver.

 $^{\rm 3}$ Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

⁴ Estimated barrier attenuation from existing barriers in the Project study area.

10.5 CONSTRUCTION NOISE THRESHOLDS OF SIGNIFICANCE

The construction noise analysis shows that the highest construction noise levels will occur when construction activities take place at the closest point from the center of Project construction activity to each of the nearby receiver locations. As shown on Table 10-7, the unmitigated construction noise levels are expected to range from 54.0 to 75.4 dBA Leq at the receiver locations in the City of San Bernardino.



	Construction Phase Hourly Noise Level (dBA Leq)							
Receiver Location ¹	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Peak Activity ²		
R1	75.4	75.4	67.7	67.4	63.3	75.4		
R2	67.0	67.0	59.3	59.0	54.9	67.0		
R3	64.6	64.6	56.9	56.6	52.5	64.6		
R4	57.3	57.3	49.6	49.3	45.2	57.3		
R5	61.4	61.4	53.7	53.5	49.3	61.4		
R6	54.0	54.0	46.3	46.0	41.9	54.0		
R7	64.6	64.6	56.9	56.6	52.5	64.6		

TABLE 10-7: UNMITIGATED CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY (DBA LEQ)

¹Noise receiver locations are shown on Exhibit 10-A.

² Estimated construction noise levels during peak operating conditions.

Table 10-8 shows the peak construction noise levels at the potentially impacted receiver locations are expected to approach 75.4 dBA Leq and will satisfy the 85 dBA Leq significance threshold during temporary Project construction activities. The noise impact due to unmitigated Project construction noise levels is, therefore, considered a *less than significant* impact at all nearby sensitive receiver locations.

TABLE 10-8: CONSTRUCTION EQUIPMENT NOISE LEVEL COMPLIANCE (DBA LEQ)

	Construction Noise Levels (dBA Leq)					
Receiver Location ¹	Peak Activity ²	Threshold ³	Threshold Exceeded? ⁴			
R1	75.4	85	No			
R2	67.0	85	No			
R3	64.6	85	No			
R4	57.3	85	No			
R5	61.4	85	No			
R6	54.0	85	No			
R7	64.6	85	No			

¹Noise receiver locations are shown on Exhibit 10-A.

² Estimated construction noise levels during peak operating conditions, as shown on Table 10-7.

³ Construction noise level threshold as shown on Table 4-2.

⁴ Do the estimated Project construction noise levels satisfy the construction noise level threshold?



10.6 CONSTRUCTION NOISE ABATEMENT MEASURES

Construction noise is temporary, intermittent and of short duration, and will not present any long-term impacts. The following practices would reduce any temporary and intermittent noise level increases produced by the construction equipment at the nearby noise-sensitive residential land uses. Prior to approval of grading plans and/or issuance of building permits, plans shall include the following notes. The Project construction supervisor shall ensure compliance with the notes and the City shall conduct periodic inspection at its discretion.

- Noise-generating Project construction activities shall only occur between the hours of 7:00 a.m. and 8:00 p.m. on any day, as specified in the City of San Bernardino Noise Ordinance.
- The construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards.
- No stationary construction equipment shall be placed within 500 feet of residential homes and other noise-sensitive receivers. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise-sensitive receivers nearest the Project site.
- The construction contractor shall locate equipment staging in the western portion of the property, near the proposed western building façade, which is the area that will create the greatest distance between construction-related noise sources and noise-sensitive receivers nearest the Project site.
- The construction contractor shall schedule haul truck deliveries to occur during the same hours specified for construction equipment (between the hours of 7:00 a.m. and 8:00 p.m. on any day) and design haul truck delivery routes to minimize the use of roads that pass by noise-sensitive land uses.

10.7 CONSTRUCTION VIBRATION IMPACTS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. It is expected that ground-borne vibration from Project construction activities would cause only intermittent, localized intrusion. The proposed Project's construction activities most likely to cause vibration impacts are:

- Heavy Construction Equipment: Although all heavy mobile construction equipment has the potential of causing at least some perceptible vibration while operating close to building, the vibration is usually short-term and is not of sufficient magnitude to cause building damage. It is not expected that heavy equipment such as large bulldozers would operate close enough to any residences to cause a vibration impact.
- Trucks: Trucks hauling building materials to construction sites can be sources of vibration intrusion if the haul routes pass through residential neighborhoods on streets with bumps or potholes. Repairing the bumps and potholes generally eliminates the problem.

Ground-borne vibration levels resulting from construction activities occurring within the Project site were estimated by data published by the Federal Transit Administration. Construction activities that would have the potential to generate low levels of ground-borne vibration within the Project site include grading and paving. Using the vibration source level of construction



equipment provided on Table 6-10 and the construction vibration assessment methodology published by the FTA, it is possible to estimate the Project vibration impacts. Table 10-9 presents the expected Project related vibration levels at the nearby receiver locations.

Based on the reference vibration levels provided by the FTA, a large bulldozer represents the peak source of vibration with a reference velocity of 0.089 in/sec (PPV) at 25 feet. At distances ranging from 81 to 952 feet from the Project site, construction vibration velocity levels are expected to approach 0.015 in/sec (PPV), as shown on Table 10-9. To assess the human perception of vibration levels in PPV, the velocities are converted to RMS vibration levels based on the Caltrans *Transportation and Construction Vibration Guidance Manual* conversion factor of 0.71. Table 10-9 shows the construction vibration levels in RMS are expected to approach 0.011 in/sec (RMS) at the nearby receiver locations. Based on the City of San Bernardino vibration standard of 0.7 in/sec, the construction-related vibration impacts are considered *less than significant*.

Further, vibration levels at the site of the closest sensitive receiver are unlikely to be sustained during the entire construction period, but will occur rather only during the times that heavy construction equipment is operating at the Project site perimeter. Moreover, construction at the Project site will be restricted to daytime hours consistent with City of San Bernardino requirements thereby eliminating potential vibration impacts during the sensitive nighttime hours.

	Distance	Receiver PPV Levels (in/sec) ²				RMS		
Receiver ¹	to Const. Activity (Feet)	Small Bulldozer	Jack- hammer	Loaded Trucks	Large Bulldozer	Peak Vibration	Velocity Levels (in/sec) ³	Threshold Exceeded? ⁴
R1	81'	0.001	0.006	0.013	0.015	0.015	0.011	No
R2	281'	0.000	0.001	0.002	0.002	0.002	0.002	No
R3	652'	0.000	0.000	0.001	0.001	0.001	0.000	No
R4	652'	0.000	0.000	0.001	0.001	0.001	0.000	No
R5	404'	0.000	0.001	0.001	0.001	0.001	0.001	No
R6	952'	0.000	0.000	0.000	0.000	0.000	0.000	No
R7	281'	0.000	0.001	0.002	0.002	0.002	0.002	No

TABLE 10-9: CONSTRUCTION EQUIPMENT VIBRATION LEVELS

¹Receiver locations are shown on Exhibit 10-A.

² Based on the Vibration Source Levels of Construction Equipment included on Table 6-10.

³ Vibration levels in PPV are converted to RMS velocity using a 0.71 conversion factor identified in the Caltrans Transportation and Construction Vibration Guidance Manual, September 2013.

⁴ Does the peak vibration exceed the City of San Bernardino maximum acceptable vibration threshold shown on Table 3-3?



11 REFERENCES

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- 2. California Department of Transportation. *Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects.* May 2011.
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- 6. California Department of Transportation Environmental Program. *Technical Noise Supplement A Technical Supplement to the Traffic Noise Analysis Protocol.* Sacramento, CA : s.n., September 2013.
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- 25. **Canadian Ministry of Transportation and Highways, Highway Environment Branch.** *Open-Graded Asphalt 'Quiet Pavement' Assessment of Traffic Noise Reduction Performance.* November 1995.
- 26. **California Department of Transportation.** *Highway Design Manual, Chapter 1100 Highway Traffic Noise Abatement.* May 2012.
- 27. Urban Crossroads, Inc. Gateway South Building 4 Air Quality Impact Analysis. April 2017.



12 CERTIFICATION

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed Gateway South Building 4 Project. The information contained in this noise study report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (949) 336-5979.

Bill Lawson, P.E., INCE Principal URBAN CROSSROADS, INC. 260 E. Baker Street, Suite 200 Costa Mesa, CA 92626 (949) 336-5979 blawson@urbanxroads.com



EDUCATION

Master of Science in Civil and Environmental Engineering California Polytechnic State University, San Luis Obispo • December, 1993

Bachelor of Science in City and Regional Planning California Polytechnic State University, San Luis Obispo • June, 1992

PROFESSIONAL REGISTRATIONS

PE – Registered Professional Traffic Engineer – TR 2537 • January, 2009 AICP – American Institute of Certified Planners – 013011 • June, 1997–January 1, 2012 PTP – Professional Transportation Planner • May, 2007 – May, 2013 INCE – Institute of Noise Control Engineering • March, 2004

PROFESSIONAL AFFILIATIONS

ASA – Acoustical Society of America ITE – Institute of Transportation Engineers

PROFESSIONAL CERTIFICATIONS

Certified Acoustical Consultant – County of Orange • February, 2011 FHWA-NHI-142051 Highway Traffic Noise Certificate of Training • February, 2013



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APPENDIX 3.1:

CITY OF SAN BERNARDINO DEVELOPMENT CODE



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ARTICLE III - GENERAL

CHAPTER 19.20 PROPERTY DEVELOPMENT STANDARDS

Section

Page

19.20.010	Purpose	III-19.20-1
19.20.020	Applicability	III-19.20-1
19.20.030	General Standards	III-19.20-1

<u>Tables</u>

<u>20.01</u> Fences, Walls, Hedges Height and	Type Limits	III-19.20-8
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19.20.010 PURPOSE

These standards shall ensure that new or modified uses and development will produce an urban environment of stable, desirable character which is harmonious with the existing and future development, consistent with the General Plan.

19.20.020 APPLICABILITY

Any permit which authorizes new construction or modifications to an existing structure in excess of 25% of the structure floor area shall be subject to the standards set forth in this Chapter.

19.20.030 GENERAL STANDARDS

No permit shall be approved unless it conforms to all of the following standards set forth in this Chapter:

- 1. Access
- 2. Additional Height Restrictions
- 3. Antennae, Satellite Dish and
 - Telecommunications Facilities
- 4. Design Considerations
- 5. Dust and Dirt
- 6. Environmental Resources/Constraints
- 7. Exterior Building Walls
- 8. Fences and Walls
- 9. Fire Protection
- 10. Fumes, Vapor and Gases
- 11. Glare
- 12. Hazardous Materials
- 24. Storage
- 25. Toxic Substances
- 26. Transportation Control Measures (TCM)
- MC 890 1/20/94, MC 1056 10/8/99

- 13. Height Determination
 - (Buildings and Structures)
- 14. Lighting
- 15. Noise
- 16. Odor
- 17. Projections into Setbacks
- 18. Public Street Improvements
- 19. Radioactivity
- 20. Refuse Storage/Disposal
- 21. Screening
- 22. Signs, Off-Street Parking, Off-Street Loading, and Landscaping
- 23. Solar Energy
- 27. Underground Utilities
- 28. Vibration

15. <u>NOISE</u>

No loudspeaker, bells, gongs, buzzers, mechanical equipment or other sounds, attentionattracting, or communication device associated with any use shall be discernible beyond any boundary line of the parcel, except fire protection devices, burglar alarms and church bells. The following provisions shall apply:

- A. In residential areas, no exterior noise level shall exceed 65dBA and no interior noise level shall exceed 45dBA.
- B. All residential developments shall incorporate the following standards to mitigate noise levels:
 - 1. Increase the distance between the noise source and receiver.
 - 2. Locate land uses not sensitive to noise (i.e., parking lots, garages, maintenance facilities, utility areas, etc.) between the noise source and the receiver.
 - 3. Bedrooms should be located on the side of the structure away from major rights-of-way.
 - 4. Quiet outdoor spaces may be provided next to a noisy right-of-way by creating a U-shaped development which faces away from the right-of-way.
- C. The minimum acceptable surface weight for a noise barrier is four pounds per square foot (equivalent to ³/₄-inch plywood). The barrier shall be of a continuous material which is resistant to sound including:
 - 1. Masonry block
 - 2. Precast concrete
 - 3. Earth berm or a combination of earth berm with block concrete.
- D. Noise barriers shall interrupt the line-of-sight between noise source and receiver.

16. <u>ODOR</u>

No use shall emit any obnoxious odor or fumes.

17. <u>PROJECTIONS/CONSTRUCTION AND EQUIPMENT PERMITTED INTO</u> <u>SETBACKS</u>

The following list represents the <u>only</u> projections, construction, or equipment that shall be permitted within the required setbacks:

A. Front Setback: Roof overhangs, fireplace chimney, awnings & canopies

APPENDIX 3.2:

CITY OF SAN BERNARDINO MUNICIPAL CODE



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any stationary engine driven by means of internal combustion of gases therein, within the City of San Bernardino without placing upon the exhaust thereof a muffler or other device so as to silence the noise or report caused by the escaping of such gases from and through such exhaust. (Ord. 465 §1, 9-5-11.)

8.51.020 Violation - Penalty.

Any person, firm or corporation violating any provision of this chapter is guilty of an infraction, which upon conviction thereof is punishable in accordance with the provisions of §1.12.010 of this Code. (Ord. MC-460, 5-13-85; Ord. 465 §2, 9-5-11.)

Chapter 8.54 NOISE CONTROL

Sections:

8.54.010	Purpose and Intent.
8.54.020	Prohibited Acts.
8.54.030	Issuance of Written Notice and Impoundment
8.54.040	Cost Recovery for Second Response.
8.54.050	Controlled Hours of Operation.
8.54.060	Exemptions.
8.54.070	Disturbances From Construction Activity.
8.54.080	Violation - Penalty
8.54.090	Severability.

8.54.010 Purpose and Intent.

- A. It is the purpose and intent of these regulations to establish community-wide noise standards. It is further the purpose of these regulations to recognize that the existence of excessive noise within the City is a condition which is detrimental to the health, safety, welfare, and quality of life of the citizens and shall be regulated in the public interest.
- B. In furtherance of the foregoing purpose, it is found and declared as follows:
 - 1. The making, creation, or maintenance of such loud, unnecessary, unnatural, or unusual noises that are prolonged, unusual, annoying, disturbing and unnatural in their time, place, and use are a detriment to public health, comfort, convenience, safety, general welfare, and the peace and quiet of the City and its inhabitants; and
 - 2. The public interest and necessity of the provisions and prohibitions hereinafter contained and enacted is declared as a matter of legislative determination and public policy, and it is further declared that the provisions and prohibitions hereinafter contained and enacted are in pursuance of, and for the purpose of, securing and promoting the public health, comfort, convenience, safety, general welfare and property, and the peace and quiet of the City and its inhabitants.

(Ord. MC-1246, 5-21-07; Ord. 1925 §1, 11-5-51.)

8.54.020 Prohibited Acts.

It shall be unlawful for any person to engage in the following activities:

- A. Sounding any horn or signal device on any automobile, motorcycle, bus, or other motor vehicle in any other manner or circumstances or for any other purpose than required or permitted by the California Vehicle Code, or other laws, for an unnecessary or unreasonable period of time;
- B. Racing the engine of any motor vehicle while the vehicle is not in motion, except when necessary to do so in the course of repairing, adjusting, or testing the same.
- C. Operating or permitting the use of any motor vehicle on any public right-of-way or public place or on private property within a residential zone for which the exhaust muffler, intake muffler, or any other noise abatement device has been modified or changed in a manner such that the noise emitted by the motor vehicle is increased above that emitted by the vehicle as originally manufactured.
- D. Using, operating, or permitting to be played, used or operated any radio receiving set, musical instrument, phonograph, or other sound amplification or production equipment for producing or reproducing sound in such a manner as to disturb the peace, quiet, or comfort of neighboring persons, or at any time with louder volume than is necessary for the convenient hearing of the person or persons who are in the room, vehicle, or other enclosure in which such machine or device is operated, and who are voluntary listeners thereto and that is:
 - 1. Plainly audible across property boundaries;
 - 2. Plainly audible through partitions common to two residences within a building;
 - 3. Plainly audible at a distance of 50 feet in any direction from the source of the music or sound between the hours of 8:00 a.m. and 10:00 p.m.; or
 - 4. Plainly audible at a distance of 25 feet in any direction from the source of the music or sound between the hours of 10:00 p.m. and 8:00 a.m.
- E. The intentional sounding or permitting the sounding outdoors of any fire, burglar, or civil defense alarm, siren, whistle, or any motor vehicle burglar alarm, except for emergency purposes or for testing, unless such alarm is terminated within fifteen minutes of activation.
- F. Yelling, shouting, whistling, or singing in a loud and boisterous manner on the public streets so as to disturb the quiet, comfort, or repose of persons in any office, dwelling, hotel, or other type of residence, or neighborhood.

- G. The keeping of any animal, fowl, or bird which by causing frequent or long continued noise disturbs the comfort, quiet, or repose of any person or neighborhood.
- Η. The unnecessary or excessive blowing of whistles, sounding of horns, ringing of bells, or use of signaling devices by operators of trains, motor trucks, and other transportation equipment.
- Ι. The creation of loud and excessive noise in connection with the loading or unloading of motor trucks and other vehicles.
- J. The shouting and crying of peddlers, hawkers, and vendors which disturbs the peace and quiet of any considerable number of persons or neighborhood.
- K. The doing of automobile, automotive body or fender repair work, or other work on metal objects and metal parts in a residential district so as to cause loud and excessive noise which disturbs the peace, quiet, and repose of any person occupying adjoining or closely situated property or neighborhood.
- The operation or use between the hours of 10:00 p.m. and 8:00 a.m. of any L. pile driver, steam shovel, pneumatic hammers, derrick, steam or electric hoist, power driven saw, or any other tool or apparatus, the use of which is attended by loud and excessive noise, except with the approval of the City.
- Μ. Creating excessive noise adjacent to any school, church, court, or library while the same is in use, or adjacent to any hospital or care facility, which unreasonably interferes with the workings of such institution, or which disturbs or unduly annoys patients in the hospital, provided conspicuous signs are displayed in such streets indicating the presence of a school, institution of learning, church, court, or hospital.
- N. Making or knowingly and unreasonably permitting to be made any unreasonably loud, unnecessary, or unusual noise that disturbs the comfort, repose, health, peace and quiet, or which causes discomfort or annoyance to any reasonable person of normal sensitivity. The characteristics and conditions that may be considered in determining whether this section has been violated include, but are not limited to, the following:
 - 1. The level of noise:
 - 2. The level of background noise;
 - 3. The proximity of the noise to sleeping facilities;
 - 4. The nature and zoning of the areas within which the noise emanates;
 - 5. The density of the inhabitation of the area within which the noise emanates:
 - 6. The time of day or night the noise occurs;
 - 7. The duration of the noise:

- 8. Whether the noise is recurrent, intermittent, or constant; and
- 9. Whether the noise is produced by a commercial or noncommercial activity.

(Ord. MC-1246, 5-21-07; Ord. 2102, 1956; Ord. 1925 §2, 1951.)

8.54.030 Issuance of Written Notice and Impoundment.

- A. Any officer who encounters a violation of this section may issue a written notice to the Responsible Person demanding immediate abatement of the violation. The written notice shall inform the recipient that a second violation of the same provision within a seventy two (72) hour period may result in the issuance of a criminal citation, the imposition of criminal and civil penalties, and confiscation and impoundment, as evidence, of the components that are amplifying or transmitting the prohibited noise.
 - 1. Responsible Person means (a) any person who owns, leases, or is lawfully in charge of the property or motor vehicle where the noise violation takes place, or (b) any person who owns or controls the source of the noise or violation. If the Responsible Person is a minor, then the parent or guardian who has custody of the child at the time of the violation shall be the Responsible Person who is liable under this chapter.
- B. Any officer who encounters a second violation of this chapter within a seventy two (72) hour period following the issuance of a written notice is empowered to confiscate and impound, as evidence, any or all of the components amplifying or transmitting the sound. The immediate confiscation of a motor vehicle to which a component is attached may be made if the same may not be removed without causing harm to the vehicle or component.
- C. Any person claiming legal ownership of the items confiscated and impounded under this chapter may request the return of the item by filing a written request with the police department within seven (7) calendar days of the confiscation. Such requests shall be processed in accordance with the procedures adopted by the department.

(Ord. MC-1246, 5-21-07; Ord. MC-649, 1-3-89; Ord. 1925 §3, 1951.)

8.54.040 Cost Recovery for Second Response.

- A. Whenever any officer issues a written notice to a responsible person to discontinue a noise violation, the Responsible Person shall be liable for the actual cost of each subsequent response required to abate the violation within seventy two (72) hours of the issuance of the written warning.
- B. The bill for the response charge shall be served upon the Responsible Person within thirty (30) days after the violation. If the Responsible Person has no last known business or residence address, the location of the violation shall be deemed to be the proper address for service. The bill shall include a notice of the right of the person being charged to request a hearing to dispute the imposition of the response charge or the amount of the charge.

C. The response charge shall be deemed to be a civil debt to the City. (Ord. MC-1246, 5-21-07; Ord. MC-460, 5-13-85; Ord. 1925 §5, 1951.)

8.54.050 Controlled Hours of Operation.

It shall be unlawful for any person to engage in the following activities other than between the hours of 8:00 a.m. and 8:00 p.m. in residential zones and other than between the hours of 7:00 a.m. and 8:00 p.m. in all other zones:

- A. Operate or permit the use of powered model vehicles and planes.
- B. Load or unload any vehicle, or operate or permit the use of dollies, carts, forklifts, or other wheeled equipment that causes any impulsive sound, raucous, or unnecessary noise within one thousand (1,000) feet of a residence.
- C. Operate or permit the use of domestic power tools, or machinery or any other equipment or tool in any garage, workshop, house, or any other structure.
- D. Operate or permit the use of gasoline or electric powered leaf blowers, such as commonly used by gardeners and other persons for cleaning lawns, yards, driveways, gutters, and other property.
- E. Operate or permit the use of privately operated street/parking lot sweepers or vacuums, except that emergency work and/or work necessitated by unusual conditions may be performed with the written consent of the City Manager.
- F. Operate or permit the use of electrically operated compressor, fan, and other similar devices.
- G. Operate or permit the use of any motor vehicle with a gross vehicle weight rating in excess of ten thousand (10,000) pounds, or of any auxiliary equipment attached to such a vehicle, including, but not limited to, refrigerated truck compressors for a period longer than fifteen (15) minutes in any hour while the vehicle is stationary and on a public right-of-way or public space except when movement of said vehicle is restricted by other traffic.
- H. Repair, rebuild, reconstruct, or dismantle any motor vehicle or other mechanical equipment or devices in a manner so as to be plainly audible across property lines.

(Ord. MC-1246, 5-21-07)

8.54.060 Exemptions.

The following activities and noise sources shall be exempt from the provisions of this chapter:

A. The use of horns, sirens, or other signaling or warning devices by persons vested with legal authority to use the same, and in pursuit of their lawful duties, such as on ambulances, fire, police, or other governmental or official equipment.

- B. Such noises as are an accompaniment and effect of a lawful business, commercial or industrial enterprise carried on in an area zoned for that purpose, except where there is evidence that such noise is a nuisance and that such a nuisance is a result of the employment of unnecessary and injurious methods of operation.
- C. Activities conducted on the grounds of any public or private school during regular hours of operation.
- D. Outdoor gatherings, public dances, shows, and sporting and entertainment events provided said events are authorized by the City.
- E. Activities conducted at public spaces during regular hours of operation.
- F. Any mechanical devices, apparatus, or equipment used, related to, or connected with emergency machinery, vehicle, or work.
- G. Construction, repair, or excavation necessary for the immediate preservation of life or property.
- H. Construction, operation, maintenance, and repairs of equipment, apparatus, or facilities of park and recreation departments, public work projects, or essential public services and facilities, including, but not limited to, trash collection and those of public utilities subject to the regulatory jurisdiction of the California Public Utilities Commission.
- I. Construction, repair, or excavation work performed pursuant to a valid written agreement with the City, or any of its political subdivisions, which provides for noise mitigation measures.
- J. Any activity to the extent that regulation thereof has been preempted by State or Federal law.
- K. Sounds generated in connection with speech or communication protected by the United States Constitution or the California Constitution, except to the extent such sounds are subject to permissible time, place, and manner restrictions.

(Ord. MC-1246, 5-21-07)

8.54.070 Disturbances from Construction Activity.

No person shall be engaged or employed, or cause any other person to be engaged or employed, in any work of construction, erection, alteration, repair, addition, movement, demolition, or improvement to any building or structure except within the hours of 7:00 a.m. and 8:00 p.m. (Ord. MC-1246, 5-21-07)

8.54.080 Violation - Penalty.

Any person violating any of the provisions of this Chapter is guilty of an infraction or a misdemeanor, which upon conviction thereof is punishable in accordance with the provisions of Section 1.12.010 of this code. (Ord. MC-1246, 5-21-07)

APPENDIX 5.1:

STUDY AREA PHOTOS



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L1 34, 4' 46.331100", 117, 16' 45.056700"

L1_E 34, 4' 47.237500", 117, 16' 47.830800"



L1_W 34, 4' 47.237500", 117, 16' 47.830800"

L2 34, 4' 45.452200", 117, 17' 2.277800"



L2_E 34, 4' 45.452200", 117, 17' 2.277800"

L2_N 34, 4' 45.452200", 117, 17' 2.277800"



L2_S 34, 4' 45.452200", 117, 17' 2.277800"

L2_SW 34, 4' 45.452200", 117, 17' 2.277800"



L2_W 34, 4' 45.452200", 117, 17' 2.277800"

L3 34, 4' 42.431000", 117, 16' 43.985500"



L3_N 34, 4' 39.711900", 117, 16' 44.864500"

L3_NE 34, 4' 39.711900", 117, 16' 44.864500"



L3_SE 34, 4' 39.711900", 117, 16' 44.864500"

L3_W 34, 4' 39.711900", 117, 16' 44.864500"



L4 34, 4' 34.493400", 117, 16' 59.970700"

L4_N 34, 4' 34.493400", 117, 16' 59.970700"



L4_S 34, 4' 34.493400", 117, 16' 59.970700"

L4_W 34, 4' 34.493400", 117, 16' 59.970700"



L5 34, 4' 27.489600", 117, 16' 40.360100"

L5_E 34, 4' 27.489600", 117, 16' 40.360100"



L5_NW 34, 4' 27.489600", 117, 16' 40.360100"

L5_S 34, 4' 27.489600", 117, 16' 40.360100"



L6_E 34, 4' 18.686800", 117, 16' 47.363800"

L6_E2 34, 4' 18.686800", 117, 16' 47.363800"



L6_S 34, 4' 18.686800", 117, 16' 47.363800"

L7 34, 4' 11.023800", 117, 16' 48.819500"



L7_N 34, 4' 11.023800", 117, 16' 48.819500"

L7_NW 34, 4' 11.023800", 117, 16' 48.819500"



L7_SE 34, 4' 11.023800", 117, 16' 48.819500"

L8 34, 4' 9.252300", 117, 17' 10.325300"



L8_E 34, 4' 9.252300", 117, 17' 10.325300"

L8_NE 34, 4' 9.252300", 117, 17' 10.325300"



L8_S 34, 4' 9.252300", 117, 17' 10.325300"

L8_W 34, 4' 8.263500", 117, 17' 8.540000"

APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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		Night CNEL	71.7 79.4				8.0 8.0	L 	21 22 23			54.0 52.0 60.0 57.0		51.0 50.0	58.0 56.0			51.0 50.0	52.0 51.0 51.0			57.0 56.0 58.0 55.0			55.0 54.0 54.0			54.0 53.0 54.0 57.0		58.0 56.0	58.0 56.0	56.0 55.0		54 0 53 0
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10100	ASTOT :NI	<i>Analyst:</i> A. Wolfe	Date: 7/6/2016				9.27 2.77		17 18		تي ن 150%	63.0 71.0	67.5	56.0	68.0	60.9		56.0	57.0	59.0	62.0	66.0 68.0	0.69	67.0	66.0 66.0	66.0	67.0	68.U 69.D	0.69	71.0	0.07	67.0	64.0 62 0	62.0
	-NIC	Analyst:	Date:			$+ \mathbf{I}$	E.TT 2.8T		15 16		L25%	68.0 78.0	73.9	62.0	73.0	66.2		63.0	62.0 63.0	65.0	68.0	73.0	73.0	73.0	73.0	74.0	75.0	76.0	76.0	77.0	74.0	72.0	70.0	66.0
24-Hour Noise Level Measurement Summary						+	2.97 2.87		13 14	g	%87	76.0 82.0	79.9	71.0	79.0	/3.8		71.0	71.0	73.0	76.0	79.0	80.0	79.0	80.0	80.0	80.0	81.0 81.0	81.0	82.0	80.0	79.0	77.0	73.0
Measurem		it to existing			_		7.2T 8.2T		11 12	Hour Beginning	L5%	78.0 83.0	81.2	74.0	81.0	/6.8	Hourly Summary	74.0	75.0	76.0	78.0	81.0 80.0	81.0	81.0	81.0 81.0	81.0	81.0	82.0 82.0	83.0	83.0	83.U 82.0	80.0	79.0	76.0
oise Level l		e Show Road adjacent to existing			_		2.2T		9 10	Ť	ريم م	81.0 86.0	83.9	78.0	84.0	80.3	Hourly	78.0	0.67	80.0	81.0	84.0 83.0	84.0	83.0	84.0 84.0	84.0	84.0	84.0 85.0	85.0	86.0 85.0	84.0 84.0	83.0	82.0	79.0
24-Hour No		Orange Show					2.2T		7 8		تن ن تن ن	83.0 88.0	85.9	81.0	86.0	82.4		81.0	81.0	82.0	83.0	86.0 85.0	86.0	86.0	86.0 86.0	86.0	86.0	86.U 87.0	87.0	88.0	86.0	86.0	84.0	810
		Project site on					9.47		5 6		Lmin	50.7 56.0	Average:	50.0		Average:		50.1	50.0	52.5	55.6	55.9	56.0	53.3	53.3 52.0	51.1	51.3	50.7	52.2	54.4	54.5	53.9	53.0	52.6
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	Project ivame: Gateway South		residential homes.	(unadjusted)			9.8	39 	2		pa1	71.6 78.4	76.1	68.4	74.6	/1./		71.9	68.6 68.6	69.7	71.7	74.6	75.6	75.2	75.2	75.7	75.8	76 9	77.3	78.2	2.77 75.6	74.9	73.0 71.6	70.3
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đ	<i>Project Name:</i> Gateway South	Gateway So	uth		2	24-Hour	Noise L	evel M	our Noise Level Measurement Summary	ent Summe		JN: 10189	Enerav	Enerav Averaae Lea	e Lea	24-Hour
			1+ 3 ~ 4+- ~ 1) <u>3</u> 0 44.00			Analyst:	<i>Analyst:</i> A. Wolfe	Day		Night	CNEL
	Location:	Lz - Located north of the Project site on washington Avenue south of Orange Show Road near existing residential homes.	a norun or u near existir	ne Proju Ng resid	ect site on v ential homi	v asningto es.	n Avenue	south of a	Jrange		Date:	Date: 7/6/2016	59.4		54.9	62.7
Hourly Leg d	Hourly Leq dBA Readings (unadjusted)	unadjusted)														
85.0 ¬											_	_				
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Energy A	Energy Average:	59.4		Average		67.2	ė	64.7	61.7	60.3	56.2	53.1	48.3		47.2	45.7
Night	Min	50.6	66.5		41.9	60.0	5	58.0	56.0	54.0	49.0	45.0	43.0		42.0	42.0
0	Max	58.4	79.6			0.69	9	66.0 66.0	63.0 -2.2	62.0 2	58.0	54.0	48.0	_	48.0	47.0
Energy Average:	Average:	54.9		Average:	e:	63.2	9	61.3	58.8	57.2	52.9	49.1	45.6		45.1	44.1
							ł	Hourly Summary	mmary							
	0 7	51.3	72.3		42.9	62.0	UN L	59.0	56.0	54.0	49.0	46.0	44.0		44.0	43.0
	т 2	52.7	c.00 79.67		41.9 41.9	60.0 62.0	n ŭ	0.00 60.0	57.0	55.0	50.0	46.0	43.0 43.0		42.U 43.0	42.0 42.0
Night	3	53.1	71.9		42.5	62.0	9	61.0	58.0	57.0	52.0	48.0	45.0		44.0	43.0
	4 -	55.3	75.9		44.1	64.0	90	62.0	60.0	59.0	54.0	51.0	47.0		46.0	44.0
	o م	58.2 58.2	75.7		40.3 44.1	66.0	0 0	65.0	63.0 63.0	61.0 62.0	58.0 58.0	54.0	48.U 47.0		48.U 46.0	47.0 45.0
	7	58.9	74.7		42.8	67.0	Ū.	66.0	63.0	62.0	59.0	56.0	47.0	-	46.0	44.0
	8	58.1	74.6		42.4	67.0	9	65.0	63.0	62.0	58.0	54.0	46.0		45.0	43.0
	9 10	60.3 64.5	83.0 97.2		42.0 43.7	71.0 68.0	9 9	68.0 65.0	64.0 62.0	62.0 60.0	57.0 56.0	54.0 52.0	47.0 47.0		45.0 46.0	43.0 44.0
	11	57.5	84.4		43.0	65.0	9	63.0	60.0	59.0	55.0	52.0	47.0		45.0	43.0
	12	55.6	71.6		44.7	65.0	90	63.0 CT 0	60.0	59.0	55.0	52.0	48.0		46.0	45.0
Dav	12 14	8.0C 6.03	74.8 85.6		44.2 44 5	0.00 70.0		0.00	63.0 63.0	60.U	0.66	0.16	47.U 48.0		40.U 47.0	45.0
(p)	15	58.5	78.3		45.9	68.0	ŌŌ	66.0	63.0	61.0 61.0	57.0	54.0	50.0		49.0	47.0
	16 11	57.8	79.1		47.5	67.0	90	65.0 67.0	62.0	61.0 51.0	57.0	54.0	50.0		49.0	48.0
	1/ 10	0.86	4.c/ c 20		47.8	0.79	ם ע	0,20	0.20	0.1.0	0.76	0.66	0.1.0		0.05	49.0
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	20	59.6	86.1		46.7	66.0	9	63.0	61.0	59.0	55.0	52.0	48.0		48.0	47.0
	21	55.4	77.0		46.6	64.0	9	62.0	60.0	58.0	54.0	51.0	48.0	+	48.0	47.0
Night	22 23	53.4 53.1	68.3 75.3		45.8 45.0	62.0 62.0	ڻ ن	61.0 60.0	58.0 58.0	56.0 56.0	53.0 52.0	50.0 49.0	47.0 46.0		47.0 46.0	46.0 45.0
	1															

24-Hour	CNEL	66.0			9.6		22 23		%667	45.0 0	51.U 48.1	46.0	51.0	48.0		47.0	46.0	46.0	49.0	51.0 49.0	48.0	46.0	46.U	45.0	46.0	47.0	48.0	50.0	50.0	51.0	51.0	51.0	0.0c 48.0	URBAN
erage Leq	Night	58.9			6.0		21 2		762%	46.0	52.U 49.5	46.0	51.0	48.6		47.0	46.0	47.0	49.0	51.0 51.0	50.0	48.0	47.U	46.0	48.0	49.0	50.0	51.0	52.0	52.0	52.0	51.0	49.0	
Energy Average Leq	Day	60.9			8.0		19 20		%067	48.0	53.U 50.7	47.0	52.0	49.2		48.0	47.0	48.0	50.0	52.0 51.0	52.0	50.0	48.0	48.0	49.0	50.0	51.0	52.0	52.0	53.0 52.0	52.0	52.0	49.0	
JN: 10189	A. Wolfe	Date: 7/6/2016			E.2a	5 5	17 18		L50%	55.0	60.U 56.6	48.0	57.0	52.0		50.0	48.0	50.0	53.0	55.0 57.0	60.0	59.0 	0.55 0.67	56.0	56.0	56.0 E6.0	56.0	57.0	57.0	56.0	57.0	56.0	52.0	
	Analyst: A. Wolfe	Date:			4.e		15 16		L25%	58.0	63.U 59.7	51.0	62.0	55.9		54.0	52.0	53.0	57.0	60.0 62.0	63.0	62.0	59.U	59.0	58.0	59.0	0.65	60.0	59.0	59.0 60.0	60.0	60.0	56.0	
ל					e.e		13 14		78%	62.0 22.0	66.U 63_1	57.0	65.0	61.2		60.0	57.0	60.0	63.0	65.0 65.0	66.0	65.0	62.0 62.0	62.0	62.0	63.0	62.0 62.0	63.0	62.0	63.0 63.0	64.0	63.0	62.0 61.0	
easu elle	man	5			2.0 7.8		11 12	Hour Beginning	L5%	63.0	67.U 64.3	59.0	67.0	62.8	ummary	61.0	59.0	62.0	65.0	66.0 67.0	67.0	66.0	63.U	64.0	63.0	64.0 65 0	03.0 64.0	64.0	63.0	64.0 64.0	65.0	65.0	63.U 62.0	
	is Street. west of Waterman				2.8		9 10		12%	66.0 20.2	69.U 67.1	63.0 63.0	69.0	65.8	Hourly Summary	64.0	63.0 62.0	65.0	68.0	69.0 69.0	69.0	68.0	60.U	67.0	66.0	68.0 68.0	00.0 66.0	67.0	66.0 22 0	67.0 66.0	68.0	67.0 CC 0	65.0	
	umas Street. v	ential homes.			9'79)	8		11%	67.0 	/1.0 68.8	64.0	71.0	68.0		66.0	64.0 65 0	67.0	71.0	71.0 71.0	70.0	70.0	67.U	0.69	68.0	69.0 71.0	0.1.U 68.0	70.0	67.0	68.0 68.0	69.0	0.69	69.0 69.0	
1	oiect site on D	urch and resid			0.23		6 7		Lmin	44.5 		45.6		age:		46.0	45.6 45.0	45.6	48.2	50.4 48.6	46.5	44.8	44.5 AA 6	44.6	45.5	45.6	44.0 47.6	49.2	48.5	50.7 49.8	50.5	50.0	49.2 47.0	
ч	orth of the Pr	an existing chi			9.9		4 5		Ттах	73.3	97.0 Average	∞		Average:		75.6	71.7 70 °	78.3	79.2	79.7 80.6	82.4	79.0	/3.3 76 0	81.0	75.1	80.4 02 1	80.6	80.3	74.3	97.0 83.6	83.3	84.5	/3.4 85.2	
Gateway Sout	13 - Located north of the Project site on Duma	Avenue, near an existing church and residential homes	unadjusted)			95 ['t 5	2 3		Leq	58.7	6.60 60.6	54.0	62.0	58.9		56.1	54.0 E4.1	56.8	59.9	61.4 62.0	62.6	61.6 	58.7 50 5	60.2	58.7	59.9 60.7	59.4	60.5	59.3 21.0	65.3 60.3	60.8	60.9	59.6	
Project Name: Gateway South		Location:	Hourly Leq dBA Readings (unadjusted)			.92 .92	0		Hour	Min	Max werage:	Min	Max	verage:		0	с с	νm	4	5 9	7	∞ (ج بر ح	11	12	13	1 t	16	17	18	5 2 2	21	22 23	
Id			Hourly Leq dB		rly Leq				Time Period	Day	Energy Average:	Night	nigin	Energy Average:				Night								Davi	Cay						Night	

24-Hour	CNEL	58.3					+	9.6		2 23		<i>866</i> 7	43.0	51.0	47.3	45.0 50.0	47.2		45.0	46.0	49.0	50.0	48.0 45.0	43.0	44.0	43.0	44.0 45.0	45.0	46.0	46.0 49.0	50.0	51.0	51.0 51.0	51.0	50.0	48.U 47.0	URBAN
age Leq	Night	51.4						7.2 8.1		21 22		195%	43.0	52.0	47.7	40.U 51.0	47.9		46.0	47.0	48.U 49.0	51.0	48.0 46.0	43.0	45.0	44.0	44.0 45.0	46.0	46.0	48.0 50.0	50.0	52.0	51.0 51.0	51.0	50.0	49.0 47.0	
Energy Average Leg	Day	52.3					+	4.E		19 20		<i>*167</i>	44.0	52.0	48.1	40.U 51.0	48.2		46.0	47.0	48.U 50.0	51.0	49.0 46.0	44.0	45.0	44.0	45.U 46.0	46.0	46.0	48.0 50.0	51.0	52.0	52.0 52.0	51.0	50.0	49.0 48.0	
0189	. Wolfe	/6/2016						5.4.4		17 18		150%	45.0	53.0	49.4	47.0 52.0	50.0		47.0	49.0	51.0	52.0	51.0	45.0	47.0	46.0	46.U 47.0	48.0	47.0	50.0	52.0	53.0	53.0	52.0	51.0	49.0 49.0	
JN: 10189	Analyst: A. Wolfe	Date: 7/6/2016						5.4.5		15 16		L25%	45.0	54.0	50.3	40.U 54.0	51.2		48.0	50.0	52.0	52.0	53.0	45.0	48.0	47.0	49.0	49.0	48.0	51.0	53.0	54.0	54.0 53.0	53.0	52.0	50.0 50.0	
				_			╞	E.E		13 14		78%	47.0	55.0	52.1	40.U 55.0	52.2		48.0	51.0	54.0	53.0	55.0	47.0	50.0	52.0	51.0 51.0	50.0	50.0	54.0	54.0	55.0	55.0 54.0	54.0	54.0	53.U 51.0	
	an							б.е е.е		11 12	Hour Beginning	L5%	48.0	57.0	53.5	49.0 55.0	52.8	mmary	49.0	51.0	55.0	54.0	55.0 55.0	48.0	51.0	55.0	50.0 52.0	52.0	51.0	56.0	55.0	57.0	56.0 55.0	55.0	55.0	53.U 51.0	
	isting parking lot of the San	0		_				τ.7	.7	10	Hou	L2%	50.0	60.0	56.3	0.1c	54.6	Hourly Summary	51.0	52.0	0.09	55.0	56.0 56.0	50.0	54.0	58.0	55.0	57.0	54.0	60.0 56.0	59.0	60.0	59.0 56.0	58.0	56.0	50.U 52.0	
	e existing park	0		_			+	9.0	5	8		11%	53.0	65.0	59.4	0.26	55.8		52.0	52.0	0.06	56.0	57.0 59.0	53.0	57.0	62.0 52.0	58.0 58.0	63.0	57.0	65.0 59.0	64.0	62.0	62.0 58.0	59.0	59.0	58.U 53.0	
	oject site in the	se.		_				6'S		6 7		Lmin	42.9	50.7		4.3.1 50.1	age:		45.1	46.1	40.0 48.2	50.1	47.9 45.1	42.9	44.0	43.3	43.b 44.5	44.8	45.5	45.6 49.1	49.9	50.7	50.0	50.6	49.4	48.2 46.3	
£	orth of the Pro	blic Golf Cours						s.s		4 5		Lmax	57.0	79.2	Average	0.cc 68.1	Average		57.1	59.1	00.1 64.8	62.4	64.7 64.3	57.0	66.2	70.3	0.8c 67.6	69.3	65.4	71.0	73.7	68.7	70.0 65 1	64.8	63.8	62.1 55.6	
Project Name: Gateway South	L4 - Located north of the Project site in the ex	Bernardino Public Golf Course.	inadjusted)					<i>7.</i> 0		2 3		ted	45.9	54.5	52.3	47.0 52.9	51.4		47.8	49.5	52.9	52.5	52.5 57 5	45.9	48.9	50.6	47.1 49.9	51.3	49.3	53.3 54 5	54.4	54.5	54.4 53.4	53.4	52.7	51.8 49.6	
oject Name:		Location:	Hourly Leq dBA Readings (unadjusted)					8.7 2.6		0		Hour	Min	Max	verage:	Max	verage:		0	← (νm	4	ۍ م	2	ø	о (11	12	13	14	16	17	18	20	21	23	
Pr			purly Leq dB.	85.0 $ op$		+ + 0.02 0.09 0.09			H 40.0 35.0 H			Time Period		μ α	Energy Average:	Night	Energy Average:				Night									Day						Night	

ď	Project Name: Gateway South	Gateway Sou [.]	th								JN: 10189	Energy Av	Energy Average Leq	24-Hour	our
	:	L5 - Located east of the Project site on Park Center Circle adjacent to existing	sast of the l	Project site	on Park (Center Circ	le adjacent tu	o existing		Analyst:	Analyst: A. Wolfe	Day	Night	CNEL	ΕL
	Location:	office buildings.	gs.				,)		Date:	Date: 7/6/2016	62.5	61.2	68.6	.6
Hourly Leg di	Hourly Leq dBA Readings (unadjusted)	unadjusted)													
				_										_	
												-			
	τ.7			9.6	L. T							i.07			
20.0 20.0 20.0 7 20.0 7 20.0 7 20.0 7		L.3	L .9	99 6.73	9	4.83	2.83	T.92	2.92	7.85 1.88	£.62	2.62	2. 6	9.6	
0.04	67	TS	S											TS S	
	0	2 3	4	5	~	~ ∞	9 10	11 12	13 14	15 16	17 18	19 20	21	22 23	- ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
							ĭ	Hour Beginning	Ъл						
Time Period	Hour	Lea	Tmax	Lmin	4	11%	12%	T5%	78%	125%	150%	%061	T95%	%661	%
ć	Min	55.2	68.5	44.7	-	64.0	62.0	59.0	58.0	55.0	52.0	49.0	48.0	46.0	0
Day	Max	70.5	84.9	49.2	0	80.0	80.0	78.0	76.0	71.0	59.0	52.0	51.0	50.0	0
Energy A	Energy Average:	62.5		Average:		68.7	66.3	64.0	62.7	58.7	55.1	50.7	49.7	48.	e.
Night	Min	49.5 57 1	62.8 70 F	43.7		57.0	56.0 76.0	54.0 75 0	52.0	49.0	47.0 61.0	45.0 54.0	45.0	44.0	0.0
Enormy	Enormy Average:	L 13	0	Averado:		0.01	0.07	0.67	/3.0	0.00	01.0	0.4C	0.25	0.00	
LIICI BY /	Average.	7.10		verage.		04.3			T.00	C.+C	4.TC	0.04	40.0	40.	0
	c	1.04								0.04	, T		41.0		c
	⊃ -	49.5 671	2 02 2 02	43./		0.76 76.0	0.02 76.0	75 0	0.26	49.0 57 0	47.U	46.0 46.0	45.U	44.0	
	2	51.7	71.8	43.9		60.0	59.0	56.0	55.0	51.0	48.0	46.0	46.0	44.0	0
Night	ß	55.1	74.3	46.7		63.0	61.0	59.0	57.0	54.0	52.0	49.0	49.0	48.0	0.
	4 1	56.7	78.3	48.6		64.0	63.0	60.0	59.0	56.0	53.0	50.0	50.0	49.0	0,0
	0 0	60.6 66.6	74.5	47.5	0.10	73.0	04.U 73.0	72.0	72.0	0.00 65.0	61.0	54.0	52.0	50.0	
	7	67.7	79.4	44.7	~	74.0	73.0	72.0	72.0	71.0	59.0	52.0	49.0	46.0	0
	8	58.4	75.2	45.3	~ ·	68.0	66.0 25 0	63.0	61.0	58.0	55.0	50.0	49.0	47.0	0.0
	بر 10	58.2 59.4	/b.3 84.9	45.8 46.3	× ~	68.0 68.0	0.co 65.0	63.0 63.0	61.U 62.0	58.0 58.0	54.0 54.0	49.0 49.0	48.0 48.0	46.U 47.0	. 0
	11	58.5	74.4	47.3		66.0	65.0	63.0	62.0	58.0	56.0	51.0	50.0	48.0	0
	12	59.1 -0.0	76.9	47.6	. <u>.</u> ,	68.0 66.0	66.0 65 0	63.0	62.0	58.0	55.0 -2.0	51.0	50.0	49.0	0,0
Dav	13	59.2 50.1	77.9	47.6		69.0 68.0	65.0 66.0	63.0 64.0	62.0 62.0	58.0	56.0 56.0	51.0	50.0	48.0	0,0
(b)	15	58.7	74.6	49.0		00.0 67.0	65.0	62.0	61.0 61.0	58.0	56.0	52.0 52.0	51.0	50.0	, o
	16 12	58.1	76.9	49.1		65.0 67.0	63.0	62.0	61.0	58.0	56.0	51.0	51.0	50.6	0,0
	10 1	1.93 F.C. 0	83.I 60 F	49.L		67.U	0.60	070	0.19	0.85	0.66	0.16	50.0	49.0	
	19	20.0 70.5	81.9	40.7	0 ~	0.08	0.co 80.0	0.10	76.0	0.06	55.0	51.0	50.0	49.0	
	20	59.7	76.1	49.2	C'	75.0	66.0	62.0	60.0	57.0	54.0	51.0	50.0	49.0	0.
	21	55.2	72.0	48.0		64.0	62.0	59.0	58.0	55.0	52.0	49.0	49.0	48.0	0
Night	22 23	55.6 51.9	77.7 66.0	45.8	<u></u> α –	64.0 61.0	62.0 59.0	58.0	57.0 55.0	53.0 51.0	50.0 48.0	48.0 46.0	47.0 46.0	46.0	0.0

24-Hour	CNEL	58.9					ζ.	τs	23		%bb1	0 1 1	0.44.0	46.7	44.0	50.0	46.8		45.0	44.0 AF 0	45.0	48.0	50.0 49.0	45.0	44.0	44.0	44.0 44.0	45.0	46.0	46.0	47.0 49.0	49.0	49.0	50.0	50.0 49.0	48.0	47.U
age Leq	Night	51.8					τ [.]		21 22		195%	15.0	45.U 51.D	47.7	45.0	50.0	47.4		46.0	45.0	46.0	48.0	50.0	47.0	45.0	45.0	45.0 45.0	46.0	47.0	47.0	40.0 49.0	49.0	50.0	51.0	51.0 50.0	49.0	47.0
Energy Average Leg	Dαy	53.1		_			8':		19 20		%Ub I	45.0	45.U	48.4	45.0	51.0	48.1		47.0	45.U	47.0	49.0	51.0	48.0	46.0	46.0	45.0	47.0	48.0	48.0	50.0	50.0	51.0	51.0	51.0 50.0	49.0	48.U
TOTOT .VIL	v. Wolfe	Date: 7/6/2016		_			£.1	75 75	17 18		150%		49.0 53 0	51.0	46.0	53.0	49.8		48.0	46.U 48.0	49.0	51.0	52.0 53.0	52.0	51.0	50.0	49.0	49.0	50.0	50.0	52.0	52.0	52.0	53.0	53.0 52.0	51.0	0.05
	Analyst: A. Wolfe	Date: 7		_			Þ.		15 16		175%		54.0	52.7	48.0	54.0	51.3		50.0	48.0	50.0	54.0	54.0 54.0	53.0	53.0	52.0	51.0	51.0	52.0	52.0	53.0	53.0	54.0	54.0	54.0 53.0	52.0	51.0
								25	13 14		18%		56.0	54.7	50.0	56.0	53.1		51.0	50.0	51.0	56.0	55.0 56.0	55.0	55.0	54.0	53.0	53.0	54.0	55.0	55.0	55.0	56.0	55.0	55.0 56.0	55.0	53.0
	i	ла River.		_			\square	TS 0S	11 12	Hour Beginning	15%		57.0	55.7	51.0	57.0	54.2	ummary	53.0	51.0	53.0	57.0	56.0 56.0	56.0	56.0	55.0	54.0	54.0	54.0	56.0	56.0	55.0	57.0	57.0	56.0 57.0	56.0	0.44
		id the Santa Ar		_			5.	23	9 10		%61		0.60	57.8	53.0	58.0	56.1	Hourly Summary	54.0	54.0 53.0	55.0	58.0	58.0 58.0	57.0	58.0	57.0	60.0 55.0	56.0	56.0	58.0	30.U 58.U	57.0	60.0	60.0 	57.0 60.0	58.0	0.73
		L6 - Located near the southern Project site boundary and the Santa Ana River.		_			Þ.	23	~ ∞		11%		0.0c	59.7	54.0	61.0	57.4		55.0	0.66	57.0	59.0	59.0 58.0	58.0	61.0	60.0	03.U 56.0	57.0	58.0	59.0	0.09	58.0	62.0	62.0 52.0	59.0 62.0	61.0 -2.0	59.0
		ern Project sit		_			8.		6 7		1 min	1 7 1	42.5 501	Average:	43.8		Average:		44.5	43.8 11 8	44.7	47.2	49.7 48.2	45.1	43.0	43.6	42.7 42.5	44.7	44.6	45.1	40.5	48.6	49.0	49.6	50.1 49.3	47.6	46.0
	•	near the south		_			9. 2.	ES ES	4 -		lmax		6.20 74.6		57.3	71.8	Aver		68.1 2	57.3 50.7	64.5	64.9	66.6 62 8	69.3	74.4	70.1	/2.1 63.5	68.4	74.6	70.3	68.1	64.0	70.4	69.2 2.2	64.1 67.5	71.8	bb.U
		L6 - Located ı	(unadjusted)	-				87	2 - 3		lea		5.U.č 5.4.3	53.1	48.1	53.8	51.8		49.7	48.1 18.8	50.3	53.2	53.6 53.8	52.9	53.4	52.2	50.8 50.8	51.1	53.0	52.4	53.4 53.4	52.9	54.3	54.3	53.8 54.0	53.1	51.7
i ofter tante. Our al oddi	:	Location:	Hourly Leq dBA Readings (unadjusted					67	- 0		Hour	Min	Max	Energy Average:	Min	Мах	Energy Average:		0	1 0	ıω	4	ъ ч	7	8	б,	11	12	13	14	16 16	17	18	19 20	20 21	22	23
•			ourly Leq d	85.0			20.0 22.0 9	о 1000 1000 1000 1000 1000 1000 1000 10			Time Period		Day	Energy /	Night)	Energy.				Night									Day						Night	

ď	Project Name: Gateway South	Gateway Sou	Ith		24-Hou	ır Noise	e Level N	Aeasurem	our Noise Level Measurement Summary		JN: 10189	Energy A	Energy Average Leq	24-H	24-Hour
	:	L7 - Located :	L7 - Located south of the Project site in an exi	Project site in	ı an existir	ng parking	isting parking lot for a Quality Inn	uality Inn		Analyst:	<i>Analyst:</i> A. Wolfe	Day	Night	S	CNEL
	Location:	hotel on Wat	hotel on Waterman Avenue.	, ei		,)				Date:	Date: 7/6/2016	52.3	50.2	57	57.4
Hourly Leg di	Hourly Leq dBA Readings (unadjusted)	unadjusted)													
85.0 ¬			_	_	-	-	-		_		_	-		-	
nrly			2		+ -		T .		H	2 .8	T	4.			6
0.04 40.05 70.07 80.0000000000	SÞ TS	67 74	05	TS TS	.22	.84 78.	23	23	'0S 'TS	TS S	23 75	23	25	TS	67
	0	2 3	- 4	- 9 - 2	8 - -	6 8	10	11 12	13 14	15 16	17 18	19	20 21	22 2	23
							HO	Hour Beginning	50						
Time Period	Hour	ped	Lmax	Lmin	L1%	%	12%	L5%	78%	L25%	L50%	%067	195%	67	%667
Day	Min	48.5 EE 2	61.2 81.0	42.1	54.0	0,0	53.0 61.0	51.0	50.0	48.0	46.0 E2.0	44.0	43.0	42	42.0
Energy A	Energy Average:	52.3		48.9 Average:	59	0.4	57.1	54.7	53.5	50.7	49.1	47.3	46.7	4	49.U 45.8
Nich+	Min	45.8			51	0.	50.0	49.0	47.0	45.0	44.0	43.0	43.0	42	42.0
INIGHT	gnt Max	51.6	71.9	47.0	62	0.	59.0	55.0	53.0	51.0	50.0	48.0	48.0	47	47.0
Energy	Average:	50.2	Ave	Average:	56	.4	54.4	52.4	51.3	49.2	48.0	45.9	45.7	44	44.8
							Hourly S	Hourly Summary							
	0,	51.2	71.9	41.6	62.0	0,0	59.0	55.0	53.0	48.0	46.0	43.0	43.0	42	42.0
	1 0	45.8 47.6	61.1 55 ()	42.1	51.0	53.0 51.0	50.0	49.0 50.0	47.0 49.0	45.0 48.0	44.0 47 0	43.0 45.0	43.0 44.0	42	42.0 43.0
Night	ιm	49.1	62.7	44.7	56.0	0.	52.0	51.0	50.0	49.0	48.0	46.0	46.0	45	45.0
	4 1	50.2	64.5	45.0	55	55.0	54.0	53.0	52.0	50.0	49.0	46.0	46.0	46	46.0
	0 0	51.4 51.4	69.7	46.0	57.0	57.0	56.0	54.0 54.0	53.0	51.0 51.0	50.0	48.0 48.0	48.0	47	46.U 47.0
	7	52.2	6.99	43.2	60.0	0.0	57.0	55.0	55.0	51.0	49.0	46.0	46.0	44	44.0
	∞ c	51.3	79.4	42.8	58.0	0,0	57.0	54.0	52.0	49.0	47.0	45.0	44.0	43	43.0
	ب 10	48.5 53.1	00.0 71.7	42.1 43.1	50 64	64.0	54.U 61.0	57.0	56.0	48.U 50.0	40.0 47.0	44.0 45.0	43.U 44.0	4 4	42.U 43.0
	11	48.5	61.2	43.7	54.0	0.0	53.0	51.0	50.0	49.0	47.0	45.0	45.0	44	44.0
	12	53.0 51.6	70.5	44.2 44.8	63.0 58.0	63.0 58.0	60.0 56.0	58.0 54.0	57.0	50.0 51.0	48.0 49.0	46.0 47.0	45.0	4 4	45.0 46.0
Day	14	50.3	62.7	44.2	58	58.0	56.0	53.0	52.0	50.0	49.0	46.0	46.0	4	45.0
	15	55.2	81.9	45.6	61	61.0	57.0	55.0	54.0	52.0	50.0	48.0	47.0	46	46.0
	16 17	51.8 51.4	63.1 65 5	47.1 47.4	59.0	59.0 58.0	58.0 56.0	55.0 54.0	53.0	51.0	50.0	49.0 49.0	48.0 48.0	47	47.0 48.0
	18	53.5	70.1	48.2	63	53.0 63.0	59.0	56.0	55.0	52.0	51.0	50.0	49.0	4 4	48.0
	19	53.4	76.6	48.7	61.0	0.	59.0	56.0	54.0	53.0	51.0	50.0	50.0	46	49.0
	20	52.8	64.9	48.9	58.0	0,0	57.0	56.0	54.0	52.0	52.0	50.0	50.0	40	49.0
	17	52.4 r 1 r	65.1 C4 0	47.6	60.0	0.0	5/.0	55.0	54.0	52.0	51.0	49.0	49.0	4 1	48.0
Night	22 23	51.5 49.9	64.0 62.2	47.0 44.8	52	59.0 57.0	57.0 55.0	54.0 52.0	53.0 52.0	51.0 50.0	50.0 48.0	48.0 46.0	48.0 46.0	4 4	47.0 45.0

0	Droiect Name: Gateway South	Gateway So	4 t		2	24-Hour	Noise	Level N	leasurem	our Noise Level Measurement Summary		MI- 10180	Fnerav	Enerav Averade Lea	na l an	2A_Hour
-						-	-	_			Analvst:	Analvst: A. Wolfe	Dav		Niaht	CNEL
	Location:	L8 - Located Commercen	La - Located south of the Project site adjacent Commercenter West and the Santa Ana River	id the Si	ct site adjo anta Ana F	acent to of River Trail.	to omice buildings on Trail.	ungs on			, Date:	, Date: 7/6/2016	53.0		ر 51.0	58.2
Hourly Lea d	Hourly Lea dBA Readinas (unadiusted)	unadiusted)												-		
		(a) a a a a a a a a a a a a a a a a a a														
Hourly 45:0 40:0	2.02 2.02	50.3	2.02	8.12	2.03	6.84	2.02	6.02	21.3	6'75 25'3	2.4.2	9:55 2:75	7.42	6.22	25.5	2.12
35.0 -	0	3	4	- -	9	8	6	10	11 12	13 14	15 16	17 18	19	20	21 22	23
									Hour Beginning							
Time Period	Hour	ped	Lmax		Lmin	L1%		12%	L5%	78%	125%	L50%	%067		195%	%667
Day	Min	48.9	63.2 		44.7	54.0		52.0	51.0	50.0	48.0	47.0	46.0		45.0	45.0
Energy	Energy Average:	53.0 53.0	7.11	Average:	51.4	64.0 59.8		60.0 57.4	54.7	53.5	51.6	50.7	53.U 49.2	+	53.U 48.9	52.U 48.3
	Min	46.7	60.6	0	43.1	50.0		49.0	48.0	48.0	47.0	46.0	44.0		44.0	44.0
NIgnt	Max	52.5				62.0		59.0	55.0	54.0	52.0	51.0	50.0	_	50.0	49.0
Energy	Energy Average:	51.0		Average:		56.1		54.3	52.6	51.8	50.2	49.0	47.6	_	47.3	46.7
								Hourly Summary	ummary							
	0 7	50.5	65.1 60.6	_	44.7	62.0		59.0	54.0	52.0	48.0	47.0	46.0		45.0	45.0
	7	40./ 50.3	72.8	_	45.1 45.0	54.0		49.0 52.0	40.U 51.0	46.U 51.0	49.0	40.0	44.0 46.0		44.0 46.0	44.0 45.0
Night	£	49.9	63.0	_	45.2	55.0		52.0	51.0	51.0	50.0	49.0	47.0		47.0	46.0
	4 ⊔	50.7	61.5	_	46.7 10 0	55.0		54.0	53.0	52.0	51.0	49.0 E1.0	48.0		48.0	47.0
	n u	52.5	69.1	_	40.0 48.9	58.0		56.0	54.0	53.0	52.0	51.0	50.0		50.0	49.0
	2	50.7	68.8		46.3	57.0		55.0	52.0	51.0	50.0	49.0	48.0		47.0	47.0
	х о	48.9 50.7	67.0 67.0	_	44./ 44.7	0.02 60.0		58.0 58.0	54.0 54.0	52.0	48.0	47.0 48.0	46.0 46.0		45.0 46.0	45.0 45.0
	10	50.9	70.1	_	45.2	61.0		59.0	54.0	52.0	49.0	48.0	47.0		46.0	46.0
	11	49.2	67.1		45.2	54.0		52.0	51.0	50.0	49.0	48.0	46.0		46.0	45.0
	12 13	51.3 57.3	54.3 76.7		46.4 46.9	0.93		0./c 55.0	53.0	53.U	51.0	0.02	48.0 48.0		48.U	47.0 47.0
Day	14	52.9	69.0		47.4	62.0		59.0	56.0	54.0	52.0	51.0	49.0		48.0	48.0
	15	54.2	77.2		48.6	62.0		58.0	56.0	55.0	53.0	52.0	50.0		50.0	49.0
	16 17	54.5 54.7	66.8 64 7		50.9 51 3	61.0 60.0	_	59.0 59.0	57.0 56.0	56.0 56.0	54.0	53.0	52.0		52.0 52.0	51.0 52.0
	18	55.6	69.8		51.4	62.0		60.0	58.0	57.0	55.0	24.0	53.0		53.0	52.0
	19	54.7	68.0		50.8	62.0		60.0	57.0	56.0	54.0	53.0	52.0		52.0	51.0
	20	52.9	63.2 76.7	_	49.4	58.0		56.0	55.0	54.0	53.0	52.0	51.0		50.0	50.0
	17	04.0 5 5	/0./ 66 9		40.5	60.0		0.60	0.0C	0.4.0	0.25 6.7 0	0.16	0.00		0.00	18.0
Night	22 23	5.2c 51.2	61.8 61.8		47.0 46.8	57.0		56.0	54.0	53.0	51.0 51.0	50.0	49.0		49.0	40.U 47.0

APPENDIX 7.1:

OFF-SITE TRAFFIC NOISE CONTOURS

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	FHV	VA-RD-77-108	HIGHV	VAY NO	DISE PR	EDICTIO	N MOD	EL			
Scenario: Road Name: Road Segment:	Washingtor					Project N Job Nur			ay South		
SITE SI	PECIFIC IN	PUT DATA				NO	ISE M	ODE		5	
Highway Data				S	ite Con	ditions (H	lard = 1	10, So	oft = 15)		
Average Daily Tr	raffic (Adt):	500 vehicle	es				A	utos:	15		
Peak Hour Pe	ercentage:	10%			Med	dium Truc	ks (2 A)	xles):	15		
Peak Hou	ur Volume:	50 vehicles	6		Hea	avy Truck	s (3+ A)	xles):	15		
Vehio	cle Speed:	25 mph		V	ehicle I	liv					
Near/Far Lane	e Distance:	12 feet				cleType	Г	Dav	Evening	Night	Daily
Site Data					von			32.9%	7.1%	10.0%	
	er Height:	0.0 feet			Ме	dium Truc	cks: 8	32.8%	5.6%	11.7%	
Barrier Type (0-Wal		0.0			E	leavy Truc	cks: 6	9.3%	8.7%	22.0%	
Centerline Dist.	. ,	30.0 feet									
Centerline Dist. to		30.0 feet		N	oise So	urce Elev			et)		
Barrier Distance to		0.0 feet				Autos:	0.0				
Observer Height (Al	bove Pad):	5.0 feet				n Trucks:	2.2		Grade Adj	unteroni	
Pad	Elevation:	0.0 feet			Heav	y Trucks:	8.0	04	Grade Auj	usumenn	. 0.0
Road	Elevation:	0.0 feet		L	ane Equ	uivalent D)istanc	e (in f	eet)		
Ro	oad Grade:	0.0%				Autos:	29.8	16			
	Left View:	-90.0 degree	es		Mediur	n Trucks:	29.5	18			
F	Right View:	90.0 degree	es		Heav	y Trucks:	29.5	47			
FHWA Noise Model	Calculation	s									
VehicleType	REMEL	Traffic Flow	Dista		Finite		Fresne		Barrier Atte		rm Atten
Autos:	58.73	-12.73		3.26		-1.20		4.49	0.0		0.00
Medium Trucks:	70.80	-24.22		3.33		-1.20		4.86	0.0		0.00
Heavy Trucks:	77.97	-27.33		3.32		-1.20		5.77	0.0	00	0.00
Unmitigated Noise L											
	eq Peak Hou	1.7		Leq Eve	· ·	Leq Ni	·		Ldn		NEL
Autos:	48		46.5		41.8		38.5		47.0		47.
Medium Trucks:	48		47.1 50.4		41.4		39.8		48.0		48.
Heavy Trucks: Vehicle Noise:	52	-	50.4 53.1		47.4		46.6 48.0		53.7 55.4		54. 55.
					49.2		48.0		55.4		55.
Centerline Distance	to Noise Co	ontour (in feet	,	70 dł	RA	65 dF	3A	6	0 dBA	,55	dBA
			Ldn:	3		7		-	15		32

	FHWA	A-RD-77-108	HIG	HWAY I	NOISE PF	REDICT	TION MO	DEL			
Scenario: Existing	With	out Project				Projec	t Name:	Gatew	ay South		
Road Name: Watern						Job I	lumber:	10189			
Road Segment: s/o Ora	nge S	how Rd.									
SITE SPECIFIC	INP	UT DATA							L INPUT	s	
Highway Data					Site Con	ditions	(Hard =	10, So	oft = 15)		
Average Daily Traffic (Ad	t): 2	5,800 vehicle	es					Autos:	15		
Peak Hour Percentag	e:	10%			Me	dium T	rucks (2 /	Axles):	15		
Peak Hour Volum	e: 2	,580 vehicle	s		He	avy Tru	icks (3+ /	Axles):	15		
Vehicle Spee		50 mph		ŀ	Vehicle I	Mix					
Near/Far Lane Distanc	e:	60 feet		ŀ		icleTyp	e	Day	Evening	Night	Daily
Site Data								82.9%	v	10.0%	
Barrier Heigh		0.0 feet			Me	edium 1	rucks:	82.8%	5.6%	11.7%	6.42
Barrier Type (0-Wall, 1-Bern		0.0			ŀ	leavy 1	rucks:	69.3%	8.7%	22.0%	3.149
Centerline Dist. to Barrie	·	50.0 feet		ļ							
Centerline Dist. to Observe		50.0 feet		ŀ	Noise Sc				eet)		
Barrier Distance to Observe		0.0 feet				Auto		000			
Observer Height (Above Pad		5.0 feet			Mediur			297			
Pad Elevatio		0.0 feet			Heav	y Trucl	(S: 8.	004	Grade Ad	justment	0.0
Road Elevatio	n:	0.0 feet			Lane Eq	uivaler	t Distan	ce (in	feet)		
Road Grad	e:	0.0%				Auto	os: 40.	311			
Left Vier	w:	-90.0 degree	es		Mediur	m Truci	ks: 40.	091			
Right Vier	W:	90.0 degree	es		Heav	y Trucl	(s: 40.	113			
FHWA Noise Model Calcula	tions										
VehicleType REMEL		Fraffic Flow	Di	istance	Finite	Road	Fresr	nel	Barrier Att	en Ber	m Atter
Autos: 70	.20	1.39		1.3	0	-1.20		-4.65	0.0	000	0.00
	.00	-10.10		1.3		-1.20		-4.87		000	0.00
Heavy Trucks: 85	.38	-13.22		1.3	3	-1.20		-5.43	0.0	000	0.00
Unmitigated Noise Levels (v					í ,						
VehicleType Leq Peak		Leq Day		Leq E	vening	Leq	Night		Ldn		VEL
Autos:	71.7		70.1		65.4		62.1		70.7		71
Medium Trucks:	71.0		69.4		63.7		62.2		70.3		70
Heavy Trucks:	72.3		69.9		66.9		66.2		73.2		73
Vehicle Noise:	76.5		74.6		70.3		68.7	, ,	76.4	4	76
Centerline Distance to Nois	e Con	tour (in feet)	70			10.1				10.4
			Lata		dBA		dBA 87	e	60 dBA		dBA
			Ldn: NFL:		33 39	-	287 300		619		333
			VHI .						646		392

	o: Existing Wi e: Waterman t: s/o Dumas	Av.						Gatew 10189	ay South		
	SPECIFIC IN	PUT DATA							L INPUT	s	
Highway Data					Site Cor	ditions	(Hard	= 10, So	oft = 15)		
Average Daily	Traffic (Adt):	23,500 vehicl	es					Autos:	15		
Peak Hour	Percentage:	10%			Me	dium Tru	ucks (2	Axles):	15		
Peak H	our Volume:	2,350 vehicle	s		He	avy Truc	cks (3+	Axles):	15		
Vel	nicle Speed:	50 mph			Vehicle	Mix					
Near/Far Lar	e Distance:	60 feet		-		icleType		Dav	Evening	Night	Daily
Site Data				-			Autos:	82.9%	~	10.0%	
Par	rier Height:	0.0 feet			М	edium Ti	rucks:	82.8%	5.6%	11.7%	6.429
Barrier Type (0-Wa		0.0 1001				Heavy Ti	rucks:	69.3%	8.7%	22.0%	3.149
Centerline Dis	t. to Barrier:	50.0 feet			Noise S	ource El	evatio	ns (in fe	pet)		
Centerline Dist. I	o Observer:	50.0 feet		F	10100 0	Auto:		0.000	,01)		
Barrier Distance t	o Observer:	0.0 feet			Modiu	m Truck		2.297			
Observer Height (J	Above Pad):	5.0 feet				/y Truck		3.004	Grade Ad	iustment	0.0
Pa	d Elevation:	0.0 feet			пеа	у писк	s. c	5.004	Olduc Auj	usunoni	0.0
Roa	d Elevation:	0.0 feet		1	Lane Eq	uivalen	t Dista	nce (in i	feet)		
F	Road Grade:	0.0%				Auto	s: 40).311			
	Left View:	-90.0 degre	es		Mediu	m Truck	s: 40	0.091			
	Right View:	90.0 degre	es		Hear	/y Truck	s: 40).113			
FHWA Noise Mode	l Calculation	s									
VehicleType	REMEL	Traffic Flow		stance		Road	Fres		Barrier Att		m Atten
Autos:	70.20	0.98		1.30	-	-1.20		-4.65		000	0.00
Medium Trucks:	81.00	-10.51		1.34		-1.20		-4.87		000	0.00
Heavy Trucks:	85.38	-13.62		1.33	-	-1.20		-5.43	0.0	000	0.00
Unmitigated Noise											
	Leq Peak Hou			Leq E			Night		Ldn		NEL
Autos:	71		69.7		65.0		61		70.3	-	70.
Medium Trucks:	70		69.0		63.3		61		69.9	-	70.
Heavy Trucks:	71		69.5		66.5		65		72.8	-	73.
Vehicle Noise:	76		74.2		69.9		68	.3	76.0)	76.
Centerline Distanc	e to Noise Co	ontour (in fee	t)	70 0	JDA	6E	dBA	4	0 dBA	55	dBA
			I dn:	12			ава 70	6	581		ава 253
						-					
		~	NFI :	13	21	21	B2		607	4	308

	FH\	WA-RD-77-108	HIGHWA	Y NOISE P	REDICT	ION MOI	DEL			
Road Nam	io: Existing Wi ne: Waterman nt: s/o Park Ce	Av.				t Name: (lumber: 1		ay South		
SITE	SPECIFIC IN	IPUT DATA				NOISE N	IODE	L INPUTS	5	
Highway Data				Site Co.	nditions	(Hard =	10, So	oft = 15)		
Average Daily	Traffic (Adt):	29,800 vehicle	s				Autos:	15		
Peak Hour	Percentage:	10%		M	edium Tr	ucks (2 A	xles):	15		
Peak H	lour Volume:	2,980 vehicles		He	eavy Tru	cks (3+ A	xles):	15		
	hicle Speed:	50 mph		Vehicle	Mix					
Near/Far La	ne Distance:	60 feet			hicleType	e	Day	Evening	Night	Daily
Site Data						Autos:	, 32.9%	7.1%	10.0%	90.45%
Ba	rrier Height:	0.0 feet		N	1edium T	rucks:	32.8%	5.6%	11.7%	6.42%
Barrier Type (0-W		0.0			Heavy T	rucks:	69.3%	8.7%	22.0%	3.14%
Centerline Di	st. to Barrier:	50.0 feet		Noise S	ource F	levations	: (in fe	et)		
Centerline Dist.	to Observer:	50.0 feet			Auto		100			
Barrier Distance	to Observer:	0.0 feet		Mediu	ım Truck	0.0				
Observer Height	(Above Pad):	5.0 feet			vy Truck		104	Grade Adj	ustment:	0.0
	ad Elevation:	0.0 feet			·					
	ad Elevation:	0.0 feet		Lane Ed		t Distand		eet)		
	Road Grade:	0.0%			Auto					
	Left View:	-90.0 degree			Im Truck					
	Right View:	90.0 degree	s	Hea	vy Truck	s: 40.1	13			
FHWA Noise Mod	el Calculation	IS		1						
VehicleType	REMEL	Traffic Flow	Distanc	e Finite	Road	Fresn	el .	Barrier Atte	en Ber	m Atten
Autos:	70.20	2.01		1.30	-1.20		4.65	0.0	00	0.000
Medium Trucks:	81.00	-9.48		1.34	-1.20		4.87	0.0	00	0.000
Heavy Trucks:	85.38	-12.59		1.33	-1.20		-5.43	0.0	00	0.000
Unmitigated Nois	e Levels (with	out Topo and I	oarrier at	tenuation)						
VehicleType	Leq Peak Hou	ur Leq Day	Leo	l Evening	Leq	Night		Ldn	CI	VEL
Autos:	72	2.3 7	0.7	66.1		62.8		71.3		71.6
Medium Trucks:	71		0.0	64.3	3	62.8		71.0		71.2
Heavy Trucks:	72	2.9 7	0.5	67.5	5	66.8		73.9		74.1
Vehicle Noise:	77	'.1 7	5.2	70.9)	69.3		77.0		77.3
Centerline Distan	ce to Noise C	ontour (in feet)								
			3	70 dBA	65	dBA	6	0 dBA	55	dBA
			dn:	147		16		681		468
		CN	IEL:	153	3	30		711	1,	532

Monday, April 17, 2017

Monday, April 17, 2017

	FHW#	A-RD-77-108 HIG	HWAY N	IOISE PF	REDICTION		EL			
	Existing With Waterman Av n/o Hospitality	ι.			Project Na Job Num			outh		
SITE S	PECIFIC INP	UT DATA			NO	SE MO	DDEL IN	IPUTS	;	
Highway Data			1	Site Con	ditions (H	ard = 1	0, Soft =	15)		
Average Daily Ti Peak Hour P	, ,	5,000 vehicles 10%		Me	dium Truck		<i>itos:</i> 1 les): 1	-		
Peak Ho	ur Volume: 2	,500 vehicles		He	avy Trucks	(3+ Ax	<i>les):</i> 1	5		
Vehi Near/Far Lane	icle Speed: e Distance:	50 mph 60 feet	1	Vehicle I	Vix icleType	Ω	ay Eve	ening	Night	Daily
Site Data				10/1	Aut			7.1%	10.0%	
	ier Height:	0.0 feet			edium Truc Ieavy Truc			5.6% 8.7%	11.7% 22.0%	6.42% 3.14%
Centerline Dist.		50.0 feet	H							
Road	Observer:		Mediui Heav L ane Eq	Autos: n Trucks: y Trucks: uivalent Di Autos: n Trucks:	0.00 2.29 8.00	0 7 4 Grad (<i>in feet)</i> 1		istment.	: 0.0	
FHWA Noise Model	Right View:	90.0 degrees		Heav	y Trucks:	40.11	3			
VehicleType		Traffic Flow Di	istance	Einito	Road	Fresne	Borr	ier Atte	n Por	m Atten
Autos:	70.20	1.25	1.30		-1.20		1.65	0.00		0.00
Medium Trucks:	81.00	-10.24	1.34		-1.20		.87	0.00		0.00
Heavy Trucks:	85.38	-13.35	1.33		-1.20		5.43	0.00		0.00
Unmitigated Noise	Levels (withou	It Topo and barr	ier atten	uation)						
VehicleType L	eq Peak Hour.	Leq Day	Leq Ev	/ening	Leq Nig	pht	Ldn		CI	NEL
Autos:	71.6	69.9		65.3		62.0		70.5		70.
Medium Trucks:	70.9	69.3		63.6		62.0		70.2		70.
Heavy Trucks:	72.2	69.8		66.8		66.0		73.1		73.
Vehicle Noise:	76.3			70.2		68.6		76.3		76.
Centerline Distance	to Noise Con	tour (in feet)	70	-						
			70 0		65 dB	4	60 dE			dBA
	Ldn:							305		
		CNEL:	13	6	294		633		1,	363

	HWA-	RD-77-108	HIG	HWAY N	NOISE PF	REDICT	ION MO	DEL			
Scenario: Existing Road Name: Waterm Road Segment: s/o Hos	an Av.	,					t Name: Number:		ay South		
SITE SPECIFIC	. ,									c	
Highway Data	INFO	DATA			Site Con					3	
Average Daily Traffic (Adt	· 40	600 vehicle	20					Autos:	,		
Peak Hour Percentage		10%			Mo	dium Ti	ucks (2 /				
Peak Hour Volume		10% 60 vehicles	e				icks (3+ /				
Vehicle Speed		50 mph	3	_			0101017	5400).	10		
Near/Far Lane Distance		60 feet		_	Vehicle I				1		
		00 1001			Vehi	icleTyp		Day	Evening	Night	Daily
Site Data								82.9%		10.0%	
Barrier Heigh	t:	0.0 feet						82.8%		11.7%	6.429
Barrier Type (0-Wall, 1-Berm):	0.0			ŀ	leavy I	rucks:	69.3%	8.7%	22.0%	3.149
Centerline Dist. to Barrie		50.0 feet		-	Noise Sc	ource E	levation	s (in f	eet)		
Centerline Dist. to Observe		50.0 feet		-		Auto		000			
Barrier Distance to Observe		0.0 feet			Mediur	n Truck	(s: 2.)	297			
Observer Height (Above Pad		5.0 feet			Heav	y Truck	(s: 8.)	004	Grade Ad	justment	0.0
Pad Elevation		0.0 feet		_		·				·	
Road Elevation		0.0 feet		_	Lane Eq				feet)		
Road Grade		0.0%				Auto		311			
Left Viev		0.0 degree			Mediur			091			
Right Viev	/: 9	0.0 degree	es		Heav	y Truck	(S: 40.	113			
FHWA Noise Model Calculat											
VehicleType REMEL		affic Flow	Di	istance	Finite		Fresr		Barrier Att		m Atten
Autos: 70.		3.35		1.3	-	-1.20		-4.65		000	0.00
Medium Trucks: 81.		-8.14		1.3		-1.20		-4.87		000	0.00
Heavy Trucks: 85.		-11.25		1.3	-	-1.20		-5.43	0.0	000	0.00
Unmitigated Noise Levels (w			-		(_			1			
VehicleType Leq Peak		Leq Day		Leq E	vening	Leq	Night		Ldn		VEL
Autos:	73.7		72.1		67.4		64.1		72.6		73.
Medium Trucks:	73.0		71.4		65.7		64.1		72.3		72.
Heavy Trucks:	74.3		71.9		68.9 68.1 75.2				75.		
Vehicle Noise:	78.4		76.6		72.3		70.7		78.4	1	78.
Centerline Distance to Noise	Conto	our (in feet)	70	dD A	65	dDA		60 dBA	55	dBA
			Ldn:		dBA 30		dBA 889		837		ава 804

Average Daily Traffic (Adt): 38,400 vehicles Autos: 15 Peak Hour Percentage: 10% Medium Trucks (2 Axles): 15 Peak Hour Volume: 3,840 vehicles Medium Trucks (2 Axles): 15 Vehicle Speed: 40 mph Heavy Trucks (3+ Axles): 15 Site Data Autos: 66 feet Vehicle Mix Barrier Height: 0.0 feet Autos: 8.2% 5.6% 11.7% 6.4 Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Darrier: 50.0 feet Medium Trucks: 8.2% 5.6% 11.7% 6.4 Barrier Distance to Observer: 0.0 feet Medium Trucks: 2.297 1.00 Medium Trucks: 2.297 1.00 Medium Trucks: 2.297 1.00 Medium Trucks: 2.297 Heavy Trucks: 8.004 Grade Adjustment: 0.0 Road Elevation: 0.0 feet Autos: 6.51 4.08 1.30 -1.20 -4.65 0.000 0.0 Medium Trucks: 77.72 -7.41 1.34 -1.20		FH	WA-RD-77-108	3 HIGI	IWAY	NOISE P	REDICT		ODEL					
Highway Data Site Conditions (Hard = 10, Soft = 15) Average Daily Traffic (Adt): 38,400 vehicles Autos: Autos: 15 Peak Hour Percentage: 10% Medium Trucks (2 Aves): 15 Peak Hour Volume: 3,840 vehicles Autos: 15 Vehicle Speed: 40 mph Medium Trucks (2 Aves): 15 Site Data Vehicle Type Day Evening Night Dail Site Data 0.0 feet Medium Trucks: 82.9% 7.1% 10.0% 90.4 Barrier Height: 0.0 feet Autos: 82.9% 5.6% 11.7% 6.4 Barrier Dist. to Barrier: 50.0 feet Medium Trucks: 82.9% 8.7% 22.0% 3.1 Observer Height (Above Pad): 5.0 feet Mades: 0.000 Medium Trucks: 8.004 Grade Adjustment: 0.0 Road Grade: 0.0% Left View: -90.0 degrees Heavy Trucks: 40.011 Medium Trucks: 40.011 FHWA Noise Model Calculations Itel View: 90.0 degrees	Road Nan	ne: Auto Cente	er Rd.							ay South				
Average Daily Traffic (Adt): 38,400 vehicles Autos: 15 Peak Hour Percentage: 10% Medium Trucks (2 Azles): 15 Peak Hour Volume: 3,840 vehicles Medium Trucks (2 Azles): 15 Vehicle Speed: 40 mph Medium Trucks (2 Azles): 15 Site Data Autos: 60 feet Vehicle Mix Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Desrver: 50.0 feet Barrier Distance to Observer: 0.0 feet Medium Trucks: 2.89% 5.6% 11.7% 64 Barrier Distance to Observer: 0.0 feet Moles Source Elevations (in feet) Autos: 0.00 Centerline Dist. to Desrver: 0.0 feet Autos: 0.00 Medium Trucks: 2.297 Pad Elevation: 0.0 feet Autos: 0.00 Medium Trucks: 2.297 Pad Elevation: 0.0 feet Autos: 40.311 Medium Trucks: 40.01 Road Grade: 0.0% Istence Finite Road Fresnel Barrier Atten Berrir Atten Medium Tr	SITE	SPECIFIC I	VPUT DATA				P	IOISE	MODE	L INPUT	s			
Deak Hour Percentage: 10% Medium Trucks (2 Axles): 15 Peak Hour Volume: 3,840 vehicles Heavy Trucks (3 Axles): 15 Vehicle Speed: 40 mph Vehicle Mix Day Evening Night Dai Site Data Autos: 60 feet Vehicle Type Day Evening Night Dai Barrier Height: 0.0 feet Medium Trucks: 82.9% 7.1% 10.0% 90.4 Barrier Height: 0.0 feet Medium Trucks: 63.9% 8.7% 22.0% 3.1 Centerline Dist. to Barrier: 50.0 feet Medium Trucks: 8.004 Grade Adjustment: 0.0 Barrier Distance to Observer: 0.0 feet Maclum Trucks: 8.004 Grade Adjustment: 0.0 Road Grade: 0.0% Matus: 40.311 Heavy Trucks: 40.311 Kehicle Type REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Bern Attin Autos: 70.7 69.1 64.4 61.1	Highway Data					Site Cor	nditions	(Hard	= 10, So	oft = 15)				
Peak Hour Volume: 3,840 vehicles Vehicle Speed: 40 mph Near/Far Lane Distance: 60 feet Vehicle Mix Site Data Autos:: 82.9% 7.1% 10.9% 90.4 Barrier Height: 0.0 feet Medium Trucks: 82.9% 7.1% 10.0% 90.4 Barrier Height: 0.0 feet Medium Trucks: 82.9% 5.6% 11.7% 6.4 Barrier Jype (O-Wall, 1-Berrn): 0.0 feet Heavy Trucks: 69.3% 8.7% 22.0% 3.1 Centerline Dist. to Barrier: 50.0 feet Moise Source Elevations (in feet) Autos:: 2.297 Heavy Trucks: 8.004 Grade Adjustment: 0.0 Pad Elevation: 0.0 feet Road Grade: 0.0% Late Equivalent Distance (in feet) Autos:: 40.031 Medium Trucks: 40.011 Medium Trucks: 40.011 <t< td=""><td>Average Daily</td><td>Traffic (Adt):</td><td>38,400 vehicl</td><td>es</td><td></td><td></td><td></td><td></td><td>Autos:</td><td>15</td><td></td><td></td></t<>	Average Daily	Traffic (Adt):	38,400 vehicl	es					Autos:	15				
Vehicle Speed: Near/Far Lane Distance: 40 mph 60 feet Vehicle Type Day Evening Night Day Site Data Autos: 82.9% 7.1% 10.0% 90.4 Barrier Height: 0.0 feet Autos: 82.9% 7.1% 10.0% 90.4 Barrier Type (0-Wall, 1-Berm): 0.0 feet Medium Trucks: 82.8% 5.6% 11.7% 6.4 Barrier Distance to Observer: 0.0 feet Motes Source Elevations (in feet) 22.0% 3.1 Centerline Dist. to Desriver: 0.0 feet Autos: 0.00 Medium Trucks: 2.297 Pad Elevation: 0.0 feet Autos: 0.00 Medium Trucks: 2.297 Pad Elevation: 0.0 feet Medium Trucks: 8.004 Grade Adjustment: 0.0 Road Grade: 0.0% Medium Trucks: 40.311 40.031 40.031 FHWA Noise Model Calculations VehicleType REIMEL Traffic Flow Distance Friste Road Fresnel Barrier Atten Berrier Atten Berrier Atten	Peak Hour	Percentage:	10%			Me	edium Tr	ucks (2	Axles):	15				
Venicie Mix Venicie Mix Venicie Mix Site Data Autos: 82.9% 7.1% 10.0% 90.4 Barrier Height: 0.0 feet Autos: 82.9% 7.1% 10.0% 90.4 Barrier Height: 0.0 feet Autos: 82.9% 5.6% 11.7% 6.4 Barrier Type (0-Wall, 1-Berm): 0.0 Feet Heavy Trucks: 69.3% 8.7% 22.0% 3.1 Centerline Dist. to Barrier: 50.0 feet Noise Source Elevations (in feet) Autos: 0.000 Deserver Height (Above Pad): 5.0 feet Autos: 0.000 Medium Trucks: 2.297 Road Grade: 0.0% Left View: -90.0 degrees Autos: 40.311 Medium Trucks: 40.091 FHWA Noise Model Calculations VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Bern Atti Medium Trucks: 77.72 -7.41 1.34 -1.20 -4.65 0.000 0.0 Medium Trucks: 7	Peak H	lour Volume:	3,840 vehicle	s		He	eavy Tru	cks (3+	Axles):	15				
Near/Far Lane Distance: 60 feet VehicleType Day Evening Night Day Site Data Autos: 82.9% 7.1% 10.0% 90.4 Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Diserver: 50.0 feet Medium Trucks: 82.8% 5.6% 11.7% 64 Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Diserver: 50.0 feet Moise Source Elevations (in feet) Centerline Dist. to Diserver: 0.0 feet Moise Source Elevations (in feet) Autos: 0.00 Barrier Distance to Observer: 0.0 feet Main Trucks: 8.004 Grade Adjustment: 0.0 Road Elevation: 0.0 feet Medium Trucks: 40.311 Left Ivew: 40.01 Road Grade: 0.0% Elevary Trucks: 40.311 Medium Trucks: 40.01 Autos: 66.51 4.08 1.30 -1.20 -4.65 0.000 0.0 Medium Trucks: 82.99 -10.52 1.33 -1.20 -4.65 0.000 0.0	Ve	hicle Speed:	40 mph		-	Vobiolo Mix								
Site Data Autos: 82.9% 7.1% 10.0% 90.4 Barrier Height: 0.0 feet Medium Trucks: 82.9% 7.1% 10.0% 90.4 Barrier Type (0-Wall, 1-Berm): 0.0 Medium Trucks: 63.9% 8.7% 22.0% 3.1 Centerline Dist. to Barrier: 50.0 feet Moise Source Elevations (in feet) Autos: 0.000 Deserver Height (Above Pad): 5.0 feet Moise Source Elevations (in feet) Autos: 0.000 Road Grade: 0.0% Left View: -90.0 degrees Autos: 40.311 FHWA Noise Model Calculations VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berner Atten Medium Trucks: 77.7 -7.41 1.34 -1.20 -4.65 0.000 0.0 Medium Trucks: 70.7 69.1 64.4 61.1 69.7 7 Medium Trucks: 70.7 69.1 64.4 61.1 69.7 7 Medium Trucks: 70.2	Near/Far La	ne Distance:	60 feet		-			9	Day	Evening	Night	Daily		
Barrier Type (IV)will, 1-Berrier): 0.0 Heavy Trucks: 69.3% 8.7% 22.0% 3.1 Centerline Dist. to Diserver: 50.0 feet Moise Source Elevations (in feet) Autos: 0.000 Barrier Type (IV) 0.0 feet Autos: 0.000 Meany Trucks: 2.297 Barrier Dist. to Observer: 0.0 feet Autos: 0.000 Meany Trucks: 8.004 Grade Adjustment: 0.0 Road Elevation: 0.0 feet Left Iview: 90.0 degrees Right View: 90.0 degrees Reavy Trucks: 40.311 Medium Trucks: 40.311 FHWA Noise Model Calculations Distance Friesnel Barrier Atten Bern Attit VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Bern Attit Medium Trucks: 77.72 7.41 1.34 -1.20 -4.65 0.000 0.01 Meany Trucks: 82.99 -10.52 1.33 -1.20 -4.65 0.000 0.01 Meany Trucks: 70.7 <	Site Data							Autos:	82.9%	7.1%	10.0%	90.45%		
Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Desriver: 50.0 feet Barrier Distance to Observer: 0.0 feet Road Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left Ivew: 90.0 degrees Right View: 90.0 degrees WehicleType REMEL Medium Trucks: 77.72 -7.41 1.30 -1.20 -4.65 Medium Trucks: 8.2.99 -1.52 1.33 -1.20 -5.4.3 Medium Trucks: 70.4 Autos: 70.4	Ba	rrier Height	0.0 feet			M	ledium T	rucks:	82.8%	5.6%	11.7%	6.42%		
Centerline Dist. to Observer: 50.0 feet Noise Source Levations (in feet) Barrier Distance to Observer: 0.0 feet Autos: 0.000 Observer Height (Above Pad): 5.0 feet Mailes: 0.000 Pad Elevation: 0.0 feet Mailes: 0.000 Road Elevation: 0.0 feet Left View: 8.004 Grade Adjustment: 0.0 Road Elevation: 0.0 feet Left View: -90.0 degrees Mailum Trucks: 40.0311 Medium Trucks: 7.00.0 degrees Finite Road Fresnel Barrier Atten Berner Mth Autos: 66.51 4.08 1.30 -1.20 -4.65 0.000 0.0 Medium Trucks: 77.72 -7.41 1.34 -1.20 -4.65 0.000 0.0 Medium Trucks: 70.7 69.1 64.4 61.1 69.7 7 Medium Trucks: 70.4 68.8 63.1 61.6 69.8 7 Medium Trucks: 70.4 68.8 63.1 61.6 69.8							Heavy T	rucks:	69.3%	8.7%	22.0%	3.149		
Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 0.0 feet Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees Right View: 90.0 degrees VehicleType REMEL Autos: 66.51 Autos: 7.7.2 -7.41 1.34 -1.20 -4.65 Medium Trucks: 70.0 Medium Trucks: 70.4 Barrier Atten Berner Atten Medium Trucks: 70.4 Medium Trucks: 70.4 <tr< td=""><td>Centerline Di</td><td>ist. to Barrier:</td><td>50.0 feet</td><td></td><td></td><td>Noise S</td><td>ource E</td><td>levatio</td><td>ns (in fe</td><td>eet)</td><td></td><td></td></tr<>	Centerline Di	ist. to Barrier:	50.0 feet			Noise S	ource E	levatio	ns (in fe	eet)				
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Observer Height (Above Pad): 5.0 feet Heavy Trucks: 8.004 Grade Adjustment: 0.0 Pad Elevation: 0.0 feet Leet View: 9.0.0 feet Lane Equivalent Distance (in feet) Lane Equivalent Distance (in feet) Road Grade: 0.0% Autos: 40.311 Medium Trucks: 40.091 Left View: 90.0 degrees Beavy Trucks: 40.011 Medium Trucks: 40.011 FHWA Noise Model Calculations Distance Friet Road Fresnel Barrier Atten Berrier Atten Berrier Atten VehicleType REMEL Traffic Flow Distance Filte Road Fresnel Barrier Atten Berrier Atten Berrier Atten Berrier Atten Medium Trucks: 77.72 -7.41 1.34 -1.20 -4.65 0.000 0.01 Unmitigated Noise Levels (without Topo and barrier attenuation) Use Levels (prevning Leg Night Ldn CNEL VehicleType Reg Peak Hour Leg Day Leg Viewing Leg Night Ldn CNEL Autos: 70.7 68.8	Barrier Distance	to Observer:	0.0 feet			Modiu								
Pad Elevation: 0.0 feet Late Fulvalent Distance (in feet) Road Glevation: 0.0 feet Lane Equivalent Distance (in feet) Road Grade: 0.0% Autos: 40.311 Left View: -90.0 degrees Medium Trucks: 40.091 FHWA Noise Model Calculations Heavy Trucks: 40.113 Vehicle Type REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Bermarkting Vehicle Type REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berm Atthen Medium Trucks: 77.72 -7.41 1.34 -1.20 -4.65 0.000 0.0 Medium Trucks: 70.7 69.1 64.4 61.1 69.7 7 Medium Trucks: 70.4 68.8 63.1 61.6 69.8 7 Medium Trucks: 70.4 68.4 61.1 69.7 7 Medium Trucks: 70.2 67.2 66.5 73.5 7 Vehicle Type	Observer Height	(Above Pad):	5.0 feet							Grade Ad	liustment	: 0.0		
Road Grade: 0.0% Autos: 40.311 Left View: -90.0 degrees Medium Trucks: 40.091 Right View: 90.0 degrees Heavy Trucks: 40.113 FHWA Noise Model Calculations VehicleType REght View: 90.0 degrees VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Bernier Atten Autos: 66.51 4.08 1.30 -1.20 -4.65 0.000 00 Medium Trucks: 77.72 -7.41 1.34 -1.20 -4.67 0.000 00 Heavy Trucks: 82.99 -10.52 1.33 -1.20 -5.43 0.000 00 Umitigated Noise Levels (without Topo and barrier attenuation) VehicleType Leg Peak Hour Leg Day Leg Evening Leg Night Ldn CNEL Autos: 70.7 69.1 64.4 61.1 69.8 7 Medium Trucks: 70.2 67.2 66.5 73.5 7 Vehicle Noise	P	ad Elevation:	0.0 feet		_									
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Right View: 90.0 degrees Heavy Trucks: 40.113 FHWA Noise Model Calculations Istance Finite Road Fresnel Barrier Atten Bern Atten VehicleType REIMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Bern Atten Autos: 66.51 4.08 1.30 -1.20 -4.65 0.000 0.0 Medium Trucks: 77.72 -7.41 1.34 -1.20 -4.87 0.000 0.0 Unnitigated Noise Levels (without Topo and barrier attenuation) VehicleType Leg Peak Hour Leg Day Leg Right Ldn CNEL Autos: 70.7 69.1 64.4 61.1 69.7 7 Medium Trucks: 70.4 68.8 63.1 61.6 69.8 7 Medium Trucks: 70.4 68.8 63.1 61.6 69.8 7 Vehicle Noise: 76.1 74.2 70.0 68.6 76.2 7 Vehicle Noise: 76.1 74.2			0.0%											
FHWA Noise Model Calculations Distance Finite Road Fresnel Barrier Atten Bern Att VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Bern Att Autos: 66.51 4.08 1.30 -1.20 -4.65 0.000 00 Medium Trucks: 77.72 -7.41 1.34 -1.20 -4.65 0.000 00 Heavy Trucks: 82.99 -10.52 1.33 -1.20 -5.43 0.000 00 Unnitigated Noise Levels (without Topo and barrier attenuation) VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Autos: 70.7 69.1 64.4 61.1 69.8 7 Medium Trucks: 70.4 68.8 63.1 61.6 69.8 7 Medium Trucks: 70.2 67.2 66.5 73.5 7 Vehicle Noise: 76.1 74.2 70.0 68.6 76.2 7			-90.0 degre	es										
VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berm Atten Autos: 66.51 4.08 1.30 -1.20 -4.65 0.000 0.0 Medium Trucks: 77.7 -7.41 1.34 -1.20 -4.65 0.000 0.0 Heavy Trucks: 82.99 -10.52 1.33 -1.20 -5.43 0.000 0.0 Unmitigated Noise Levels (without Topo and barrier attenuation) VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Medium Trucks: 70.7 69.1 64.4 61.1 69.7 7 Heavy Trucks: 70.4 68.8 63.1 61.6 69.8 7 Heavy Trucks: 70.4 68.8 63.1 61.6 69.8 7 Vehicle Noise: 76.1 74.2 70.0 68.6 76.2 7 Vehicle Noise: 76.1 74.2 70.0 68.6 76.2 7 <		Right View:	90.0 degre	es		Hea	vy Truck	s: 4(0.113					
Autos: 66.51 4.08 1.30 -1.20 -4.65 0.000 0.0 Medium Trucks: 77.72 -7.41 1.34 -1.20 -4.65 0.000 0.0 Heavy Trucks: 77.72 -7.41 1.34 -1.20 -4.65 0.000 0.0 Umitigated Noise Levels (without Topo and barrier attenuation) -1.20 -5.43 0.000 0.0 Umitigated Noise Levels (without Topo and barrier attenuation) Leq Day Leq Evening Leq Night Ldn CNEL Autos: 70.7 69.1 64.4 61.1 69.7 7 Medium Trucks: 70.4 68.8 63.1 61.6 69.8 7 Heavy Trucks: 72.6 70.2 67.2 66.5 73.5 7 Vehicle Noise: 76.1 74.2 70.0 68.6 76.2 7 Centerline Distance to Noise Contour (in feet)	FHWA Noise Mod		-											
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Heavy Trucks: 82.99 -10.52 1.33 -1.20 -5.43 0.000 0.000 Unmitigated Noise Levels (without Topo and barrier attenuation) Leq Day Leq Evening Leq Night Ldn CNEL VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Matus: 70.7 69.1 64.4 61.1 69.7 7 Medium Trucks: 70.4 68.8 63.1 61.6 69.8 7 Heavy Trucks: 70.4 67.2 67.2 66.5 73.5 7 Vehicle Noise: 76.1 74.2 70.0 68.6 76.2 7 Centerline Distance to Noise Contour (in feet) Image: Contour (in fen						-						0.00		
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VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Autos: 70.7 69.1 64.4 61.1 69.7 7 Medium Tucks: 70.4 68.8 63.1 61.6 69.8 7 Medium Tucks: 70.4 67.2 67.2 66.5 73.5 7 Vehicle Noise: 76.1 74.2 70.0 68.6 76.2 7 Centerline Distance to Noise Contour (in feet)	,					-	-1.20		-5.43	0.0	000	0.00		
Autos: 70.7 69.1 64.4 61.1 69.7 7 Medium Trucks: 70.4 68.8 63.1 61.6 69.8 7 Heavy Trucks: 72.6 70.2 67.2 66.5 73.5 7 Vehicle Noise: 76.1 74.2 70.0 68.6 76.2 7 Centerline Distance to Nolse Contour (in feet)									-					
Medium Trucks: 70.4 68.8 63.1 61.6 69.8 77 Heavy Trucks: 72.6 70.2 67.2 66.5 73.5 7 Vehicle Noise: 76.1 74.2 70.0 68.6 76.2 7 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA Ldn: 129 277 598 1,288	,,				Leq E									
Heavy Trucks: 72.6 70.2 67.2 66.5 73.5 77 Vehicle Noise: 76.1 74.2 70.0 68.6 76.2 7 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA Ldn: 129 277 598 1,288												70.		
Vehicle Noise: 76.1 74.2 70.0 68.6 76.2 7 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA Ldn: 129 277 598 1,288											-	70.		
Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA Ldm: 129 277 598 1,288	,								-		-	73.		
70 dBA 65 dBA 60 dBA 55 dBA Ldn: 129 277 598 1,288						70.0		68	.6	76.2	2	76.		
Ldn: 129 277 598 1,288	Centeriine Distan	ce to Noise C	ontour (in fee	t)	70	dD A	£F	dDA	4	SO dBA	FE	dPA		
				1 dn										
							-			598 624				
			0				-			02.	.,			

	FH	WA-RD-77-10	B HIGHV	VAY NC	ISE P	REDICT	ION MO	DEL			
	e: Orange Sh	ithout Project now Rd.					t Name: lumber:		ay South		
SITE	SPECIFIC II	VPUT DATA							L INPUT	s	
Highway Data				Si	te Cor	nditions	(Hard =	10, So	oft = 15)		
Average Daily	Traffic (Adt):	31,200 vehic	les					Autos:	15		
Peak Hour	Percentage:	10%			Me	edium Tr	ucks (2 A	Axles):	15		
Peak H	our Volume:	3,120 vehicle	s		He	eavy Tru	cks (3+ A	(xles)	15		
Vei	hicle Speed:	50 mph		Ve	ehicle	Mix					
Near/Far La	ne Distance:	60 feet				nicleType	9	Day	Evening	Night	Daily
Site Data								82.9%	7.1%	10.0%	
Bar	rier Heiaht:	0.0 feet			М	edium T	rucks:	82.8%	5.6%	11.7%	6.42%
Barrier Type (0-W		0.0				Heavy T	rucks:	69.3%	8.7%	22.0%	3.14%
Centerline Dis	at. to Barrier:	50.0 feet		N	nise S	ource F	levation	s (in fe	et)		
Centerline Dist.	to Observer:	50.0 feet		-		Auto		000			
Barrier Distance	to Observer:	0.0 feet			Madiu	m Truck		297			
Observer Height (.	Above Pad):	5.0 feet				vy Truck		207	Grade Ad	iustment	: 0.0
	d Elevation:	0.0 feet		_					,		
	d Elevation:	0.0 feet		Lá	ne Eq		t Distan		eet)		
F	Road Grade:	0.0%				Auto					
	Left View:	-90.0 degre				m Truck					
	Right View:	90.0 degre	es		Hea	vy Truck	s: 40.	113			
FHWA Noise Mode	el Calculation	15									
VehicleType	REMEL	Traffic Flow	Dista	ance	Finite	Road	Fresr	el .	Barrier Att	en Ber	m Atten
Autos:	70.20	2.21		1.30		-1.20		-4.65	0.0	000	0.000
Medium Trucks:	81.00			1.34		-1.20		-4.87		000	0.000
Heavy Trucks:	85.38	-12.39		1.33		-1.20		-5.43	0.0	000	0.000
Unmitigated Noise	e Levels (with	nout Topo and	l barrier	attenu	ation)						
	Leq Peak Ho		/	Leq Eve		,	Night		Ldn		NEL
Autos:		2.5	70.9		66.3		63.0		71.5		71.8
Medium Trucks:		1.9	70.2		64.5		63.0		71.2		71.4
Heavy Trucks:		3.1	70.7		67.7		67.0		74.1		74.3
Vehicle Noise:	7	7.3	75.4		71.1		69.5	5	77.2	2	77.5
Centerline Distance	e to Noise C	ontour (in fee	t)								
				70 dBA 65 dBA 60 dBA				dBA			
			Ldn:	151				513			
		C	NEL:	158		3	40		733	1,	580

Monday, April 17, 2017

Monday, April 17, 2017

Monday, April 17, 2017

	FH\	NA-RD-77-108	HIGHW	AY NO	DISE PF	REDICTION		DEL			
Scenario	: Existing W	thout Project				Project Na	me: C	Gatewa	ay South		
Road Name	e: Orange Sh	ow Rd.				Job Num	ber: 1	0189			
Road Segmen	t: e/o Arrowh	ead Av.									
	PECIFIC IN	IPUT DATA								s	
Highway Data				S	ite Con	ditions (H	ard =	10, Sc	oft = 15)		
Average Daily T	raffic (Adt):	24,400 vehicle	s				A	Autos:	15		
Peak Hour F	Percentage:	10%			Me	dium Truck	's (2 A	xles):	15		
Peak Ho	our Volume:	2,440 vehicles			He	avy Trucks	(3+ A	xles):	15		
Veh	icle Speed:	50 mph		v	ehicle l	Mix					
Near/Far Lan	e Distance:	60 feet		-		icleType		Dav	Evening	Night	Daily
Site Data						Aut	os: 8	32.9%	0	10.0%	
Barr	rier Height:	0.0 feet			Me	edium Truc	ks: t	32.8%	5.6%	11.7%	6.42%
Barrier Type (0-Wa	•	0.0			ŀ	Heavy Truc	ks: (69.3%	8.7%	22.0%	3.14%
Centerline Dis		50.0 feet		N	loise So	ource Elev	ations	; (in fe	et)		
Centerline Dist. to		50.0 feet				Autos:	0.0		.,		
Barrier Distance to		0.0 feet			Mediur	m Trucks:	2.2	97			
Observer Height (A	,	5.0 feet			Heav	v Trucks:	8.0	04	Grade Ad	justment	: 0.0
	d Elevation:	0.0 feet		_							
	d Elevation:	0.0 feet		L	ane Eq	uivalent Di			feet)		
R	load Grade:	0.0%				Autos:	40.3				
	Left View:	-90.0 degree				m Trucks:	40.0				
	Right View:	90.0 degree	s		Heav	y Trucks:	40.1	13			
FHWA Noise Mode											
VehicleType	REMEL	Traffic Flow	Distar				Fresn		Barrier Att		m Atten
Autos:	70.20	1.14		1.30		-1.20		4.65		000	0.00
Medium Trucks:	81.00	-10.35		1.34		-1.20		4.87		000	0.00
Heavy Trucks:	85.38	-13.46		1.33		-1.20		-5.43	0.0	000	0.00
Unmitigated Noise		1	1								
,1	Leq Peak Hou			eq Ev	~	Leq Nig			Ldn		NEL
Autos:	71		9.8 9.2		65.2 63.5		61.9 61.9		70.4 70.1		70. 70.
Medium Trucks:	70		9.2 9.7		63.5 66.7		61.9 65.9		70.1		
Heavy Trucks: Vehicle Noise:	72		9.7		56.7 70.1		65.9		73.0		73.
			4.3		70.1		06.5		76.1	1	76.4
Centerline Distance	e to NOISE C	ontour (in feet)		70 d	BA	65 dB	4	6	0 dBA	55	dBA
		1	dn:	128		277	•		596		285
		-	EL:					341			
		0.1				200				.,	

	FHW	A-RD-77-108	HIGH	IWAY N	IOISE PF	EDICT	ION MO	DEL			
Scenario: Ex	isting Wit	nout Project				Project	t Name:	Gatew	ay South		
Road Name: Or	range Sho	w Rd.				Job N	lumber:	10189			
Road Segment: e/e	o Washing	ton Av.									
SITE SPEC	CIFIC IN	PUT DATA							L INPUT	s	
Highway Data				4	Site Con	ditions	(Hard =	10, So	oft = 15)		
Average Daily Traffic	c (Adt):	24,100 vehicle	es					Autos:	15		
Peak Hour Perce	entage:	10%			Me	dium Tr	ucks (2 /	Axles):	15		
Peak Hour V	olume:	2,410 vehicle	s		Hea	avy Tru	cks (3+ /	Axles):	15		
Vehicle	Speed:	50 mph		-	Vehicle I	<i>liv</i>					
Near/Far Lane Dis	stance:	60 feet		-		cleType	9	Day	Evening	Night	Daily
Site Data								82.9%	•	10.0%	
Barrier H	Joight:	0.0 feet			Me			82.8%		11.7%	
Barrier Type (0-Wall, 1-		0.0 feet						69.3%		22.0%	
Centerline Dist. to	,	50.0 feet									
Centerline Dist. to Ob		50.0 feet		1	Noise So				eet)		
Barrier Distance to Ob		0.0 feet				Auto		000			
Observer Height (Abov		5.0 feet			Mediur			297			
Pad Ele		0.0 feet			Heav	y Truck	:s: 8.	004	Grade Ad	justment	: 0.0
Road Fle		0.0 feet			Lane Equ	ıivalen	t Distan	ce (in	feet)		
	Grade:	0.0%		F	Lano Lqu	Auto					
	ft View:	-90.0 degree	ac		Mediur						
	t View:	90.0 degree				y Truck					
FHWA Noise Model Cal	louistions										
	EMEL	Traffic Flow	Dis	stance	Finite	Road	Fresr	nel	Barrier Att	en Ber	m Atter
Autos:	70.20	1.09	Dic	1.30		-1.20	11001	-4.65		000	0.00
Medium Trucks:	81.00	-10.40		1.34		-1.20		-4.87		000	0.00
Heavy Trucks:	85.38	-13.51		1.33		-1.20		-5.43		000	0.00
Unmitigated Noise Lev	els (witho	ut Topo and	barri	er atten	uation)						
VehicleType Leq I	Peak Houi	Leq Day	r	Leg E	/ening	Leq	Night		Ldn	C	NEL
Autos:	71.	4	69.8		65.1		61.8	3	70.4	1	70
Medium Trucks:	70.	7	69.1		63.4		61.9)	70.0)	70
Heavy Trucks:	69.6		66.6		65.9)	72.9)	73		
Vehicle Noise:	76.	2	74.3		70.0		68.4	1	76.1	I	76
Centerline Distance to	Noise Co	ntour (in feet)								
				70 c			dBA	6	60 dBA	55	dBA
			Ldn:	12			74		591	1,	274
		0	VFI :	13	2		87		617	1	330

Scenari	o: Existing Wi	ithout Project				Project	Name: (Gatewa	ay South		
	e: Orange Sh						umber: 1		ay oouur		
Road Segmer											
SITE	SPECIFIC IN	IPUT DATA				N	OISE N	IODE	L INPUT	S	
Highway Data				Si	te Con	ditions	(Hard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt):	21,200 vehicle	es				-	Autos:	15		
Peak Hour	Percentage:	10%			Me	dium Tru	icks (2 A	xles):	15		
Peak H	our Volume:	2,120 vehicles	s		He	avy Truc	ks (3+ A	xles):	15		
Vei	hicle Speed:	50 mph		Ve	ehicle l	Mix					
Near/Far Lai	ne Distance:	60 feet		ve		icleType		Day	Evening	Night	Daily
Site Data						A	utos:	, 32.9%	7.1%	10.0%	90.45%
Rar	rier Heiaht:	0.0 feet			Me	edium Tr	ucks:	32.8%	5.6%	11.7%	6.42%
Barrier Type (0-W		0.0			ŀ	Heavy Tr	ucks:	69.3%	8.7%	22.0%	3.14%
Centerline Dis		50.0 feet		-							
Centerline Dist.		50.0 feet		NO	orse Sc	ource El			et)		
Barrier Distance	to Observer:	0.0 feet				Autos	. 0.0				
Observer Height (5.0 feet				m Trucks					
0,1	ad Flevation:	0.0 feet			Heav	ry Trucks	: 8.0	04	Grade Adj	ustmen	t: 0.0
Roa	ad Elevation:	0.0 feet		La	ane Eq	uivalent	Distand	e (in i	feet)		
, i i i i	Road Grade:	0.0%			·	Autos	: 40.3	11	,		
	Left View:	-90.0 degree	29		Mediur	m Trucks	: 40.0	91			
	Right View:	90.0 degree			Heav	y Trucks	40.1	13			
FHWA Noise Mode	el Calculation	S									
VehicleType	REMEL	Traffic Flow	Dista	ance	Finite	Road	Fresn	el	Barrier Atte	en Be	rm Atten
Autos:	70.20	0.53		1.30		-1.20		4.65	0.0	00	0.00
Medium Trucks:	81.00	-10.96		1.34		-1.20		4.87	0.0	00	0.000
Heavy Trucks:	85.38	-14.07		1.33		-1.20		-5.43	0.0	00	0.000
Unmitigated Noise			barrier	attenua	ation)						
	Leq Peak Hou			Leq Eve	~	Leq	· ·		Ldn		NEL
Autos:	70		69.2		64.6		61.3		69.8		70.2
Medium Trucks:	70		68.6		62.9		61.3		69.5		69.
Heavy Trucks:	71		69.1		66.1		65.3		72.4		72.0
Vehicle Noise:	75	5.6	73.7		69.5		67.9		75.5	i	75.8
Centerline Distanc	ce to Noise Co	ontour (in feet)					_		-	
				70 dB		65 0		6	0 dBA		5 dBA
			Ldn:	117		25	52		543	1	,170
		-	VEL:	122		26			567		.221

	FHV	VA-RD-77-108	HIGH	IWAY NO	OISE P	REDICT	ION MOI	DEL			
Scenario: Road Name: Road Segment:		n Av.					Name: (umber: 1		ay South		
	PECIFIC IN	IPUT DATA							L INPUT	s	
Highway Data				S	ite Cor	nditions	(Hard =	10, Sc	oft = 15)		
Average Daily Tr	affic (Adt):	773 vehicle	es				/	Autos:	15		
Peak Hour P	ercentage:	10%					ucks (2 A		15		
Peak Hou	ur Volume:	77 vehicle	s		He	eavy True	cks (3+ A	xles):	15		
Vehi	cle Speed:	25 mph		v	ehicle	Mix					
Near/Far Lane	Distance:	12 feet		F		nicleType		Day	Evening	Night	Daily
Site Data								82.9%	•	· ·	58.50%
Barri	er Heiaht:	0.0 feet			М	edium Ti	rucks:	82.8%	5.6%	11.7%	11.91%
Barrier Type (0-Wai		0.0				Heavy Ti	rucks:	69.3%	8.7%	22.0%	29.58%
Centerline Dist.	to Barrier:	30.0 feet		Ν	loise S	ource El	evations	s (in fe	et)		
Centerline Dist. to	Observer:	30.0 feet				Auto			.,		
Barrier Distance to	Observer:	0.0 feet			Mediu	m Truck					
Observer Height (A	bove Pad):	5.0 feet				vy Truck		04	Grade Ad	iustment	: 0.0
	Elevation:	0.0 feet				·					
	Elevation:	0.0 feet		L	ane Eq		t Distand		feet)		
Ro	oad Grade:	0.0%				Auto					
	Left View:	-90.0 degre				m Truck					
F	Right View:	90.0 degre	es		Hear	vy Truck	s: 29.5	547			
FHWA Noise Model	Calculation	s									
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite	Road	Fresn	el	Barrier Att	en Bei	rm Atten
Autos:	58.73	-12.73		3.26		-1.20		-4.49	0.0		0.000
Medium Trucks:	70.80	-19.64		3.33		-1.20		-4.86	0.0		0.000
Heavy Trucks:	77.97	-15.69		3.32		-1.20		-5.77	0.0	000	0.000
Unmitigated Noise											
71	eq Peak Hou			Leq Ev		,	Night		Ldn		NEL
Autos:	48		46.5		41.8		38.5		47.0		47.4
Medium Trucks:	53		51.7		46.0		44.4		52.6		52.8
Heavy Trucks:	64		62.0		59.0		58.3		65.3		65.6
Vehicle Noise:	64		62.5		59.3		58.5		65.6	i	65.9
Centerline Distance	to Noise Co	ontour (in feet)	70 d	DA	65	dBA	6	OdPA	55	dBA
	l dn:				70 dBA 65 dBA 60 dBA 15 33 71		71		153		
			NEL:	16			13 14		74		155
			*44.	10		3			.4		100

Monday, April 17, 2017

Monday, April 17, 2017

	FHW	/A-RD-77-108 HI	GHWAY I	NOISE PR	REDICTIO	N MODEL		
	: Existing Wit					ame: Gatev		
	: Waterman A				Job Nun	ber: 10189		
Road Segment	s/o Orange	Show Rd.						
	PECIFIC IN	PUT DATA					L INPUTS	
Highway Data				Site Con	ditions (H	ard = 10, S	oft = 15)	
Average Daily T	raffic (Adt):	26,610 vehicles				Autos	15	
Peak Hour F	Percentage:	10%				is (2 Axles)		
Peak Ho	ur Volume:	2,661 vehicles		He	avy Trucks	(3+ Axles)	15	
Veh	icle Speed:	50 mph	ŀ	Vehicle I	Mix			
Near/Far Lan	e Distance:	60 feet	ŀ		icleType	Dav	Evening	Night Daily
Site Data					Aut	os: 82.9%	0	10.0% 90.61
Barr	ier Heiaht:	0.0 feet		Me	edium Truc	ks: 82.8%	5.6%	11.7% 6.25
Barrier Type (0-Wa		0.0		ŀ	leavy Truc	ks: 69.3%	8.7%	22.0% 3.14
Centerline Dist	to Barrier:	50.0 feet	-	Noise Sc	ource Elev	ations (in f	eet)	
Centerline Dist. to	o Observer:	50.0 feet	ŀ		Autos:	0.000	000)	
Barrier Distance to	o Observer:	0.0 feet		Modiu	n Trucks:	2.297		
Observer Height (A	bove Pad):	5.0 feet			v Trucks:	8.004	Grade Adiu	stment: 0.0
Pad	d Elevation:	0.0 feet			,			
Road	d Elevation:	0.0 feet		Lane Eq		istance (in	feet)	
R	oad Grade:	0.0%			Autos:	40.311		
	Left View:	-90.0 degrees			n Trucks:	40.091		
	Right View:	90.0 degrees		Heav	y Trucks:	40.113		
FHWA Noise Model	Calculations	;	1					
VehicleType	REMEL		Distance	Finite	Road	Fresnel	Barrier Atte	n Berm Atte
Autos:	70.20	1.53	1.3		-1.20	-4.65	0.00	
Medium Trucks:	81.00	-10.08	1.3		-1.20	-4.87	0.00	
Heavy Trucks:	85.38	-13.07	1.3	13	-1.20	-5.43	0.00	0.0
Unmitigated Noise						1		
<i>,</i> ,	eq Peak Hou			vening	Leq Ni		Ldn	CNEL
Autos:	71.		-	65.6		62.3	70.8	71
Medium Trucks:	71.			63.7		62.2	70.4	70
Heavy Trucks:	72.			67.1		66.3	73.4	73
Vehicle Noise:	76.		7	70.4		68.8	76.5	76
Centerline Distance	e to Noise Co	ntour (in feet)	70	-10.4	05 -10		00-104	66 - ID A
		1.4		dBA	65 dB	А	60 dBA	55 dBA
	Ldn:							1,356
		CNEL	. 1	42	305		657	1,416

	FHW	/A-RD-77-108	HIGH	HWAY N	IOISE PI	REDICTI	ION MC	DEL			
Scenario: Existing									ay South		
Road Name: Watern						Job N	umber:	10189			
Road Segment: s/o Dur	nas	St.									
SITE SPECIFIC	IN C	PUT DATA							L INPUT	s	
Highway Data					Site Con	ditions	(Hard =	= 10, So	oft = 15)		
Average Daily Traffic (Ad	t):	24,310 vehicle	s					Autos:	15		
Peak Hour Percentag	e:	10%			Me	dium Tru	ucks (2	Axles):	15		
Peak Hour Volum	e:	2,431 vehicles	5		He	avy Truc	cks (3+	Axles):	15		
Vehicle Spee	d:	50 mph		1	Vehicle	Mix					
Near/Far Lane Distanc	e:	60 feet		H		icleTvpe		Dav	Evening	Night	Dailv
Site Data					1011		Autos:	82.9%	v	10.0%	
		0.0 feet			M	edium Ti		82.8%		11.7%	
Barrier Heigh Barrier Type (0-Wall, 1-Bern		0.0 feet				Heavy Tr		69.3%		22.0%	
Centerline Dist. to Barrie	·	0.0 50.0 feet								22.070	0.111
Centerline Dist. to Barrie Centerline Dist. to Observe		50.0 feet		1	Noise So			ns (in f	eet)		
Barrier Distance to Observe		0.0 feet				Autos		.000			
Observer Height (Above Pad		5.0 feet				m Trucks		.297			
Pad Elevatio	·	0.0 feet			Heav	y Trucks	s: 8	.004	Grade Ad	justment	: 0.0
Road Elevatio		0.0 feet		1	Lane Eq	uivalent	t Distar	ice (in	feet)		
Road Grad		0.0%		-		Auto		.311			
Left Vier		-90.0 degree	s		Mediu	m Truck		.091			
Right Vie		90.0 degree			Heav	v Trucks	s: 40	.113			
						-					
FHWA Noise Model Calcula	_										
VehicleType REMEL		Traffic Flow	Dis	stance		Road	Fres		Barrier Att		m Atter
	.20	1.14		1.30		-1.20		-4.65		000	0.00
	.00	-10.49		1.34		-1.20		-4.87		000	0.00
Heavy Trucks: 85	.38	-13.47		1.33	3	-1.20		-5.43	0.0	000	0.00
Unmitigated Noise Levels (v	vitho	out Topo and	barri	ier atten	uation)						
VehicleType Leq Peak				Leq E	,	Leq	Night		Ldn		NEL
Autos:	71.		69.8		65.2		61.		70.4		70
Medium Trucks:	70.		59.0		63.3		61.		70.0		70
Heavy Trucks: 72.0 69.7					66.7		65.	-	73.0		73
Vehicle Noise:	76.	2 7	74.3		70.0		68.	4	76.1	1	76
Centerline Distance to Nois	e Co	ntour (in feet)									
			. L	70 c			dBA	6	60 dBA		dBA
Ldn: CNEL:			12	128 275 593 1,27 133 287 619 1,33			277				
				13		-			619		333

		WA-RD-77-108									_
	io: Existing W				1				ay South		
Road Nam Road Segme	e: Waterman					JOD IN	lumber	: 10189			
·											
	SPECIFIC IN	NPUT DATA							L INPUT	S	
Highway Data				1	Site Cond	litions	(Hard		,		
Average Daily	, ,	30,508 vehicl	es					Autos:			
	Percentage:	10%					,	? Axles):	15		
	lour Volume:	3,051 vehicle	s		Hea	vy Tru	cks (3+	- Axles):	15		
	hicle Speed:	50 mph		1	Vehicle M	lix					
Near/Far La	ne Distance:	60 feet			Vehic	leType	9	Day	Evening	Night	Daily
Site Data							Autos:	82.9%	7.1%	10.0%	89.44%
Bai	rier Height:	0.0 feet			Me	dium T	rucks:	82.8%	5.6%	11.7%	6.54%
Barrier Type (0-W		0.0			H	eavy T	rucks:	69.3%	8.7%	22.0%	4.02%
Centerline Dis	st. to Barrier:	50.0 feet			Voise So	urce E	levatio	ons (in fe	et)		
Centerline Dist.		50.0 feet		_		Auto		0.000	,		
Barrier Distance		0.0 feet			Medium	Truck	s: 2	2.297			
Observer Height (,	5.0 feet			Heavy	Truck	s: 8	3.004	Grade Ad	iustment	: 0.0
	ad Elevation:	0.0 feet		_							
	ad Elevation:	0.0 feet		1	ane Equ				teet)		
	Road Grade:	0.0%				Auto		0.311			
	Left View:	-90.0 degre			Medium			0.091			
	Right View:	90.0 degre	es		Heavy	Truck	S: 4(0.113			
FHWA Noise Mode	el Calculation										
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite F		Fre		Barrier Att		m Atten
Autos:	70.20	2.06		1.30	-	-1.20		-4.65		000	0.000
Medium Trucks:	81.00			1.34		-1.20		-4.87		000	0.000
Heavy Trucks:	85.38	-11.41		1.33	3	-1.20		-5.43	0.0	000	0.00
Unmitigated Noise								-			
VehicleType	Leq Peak Ho			Leq Ev		Leq	Night		Ldn		NEL
Autos:			70.8		66.1		62		71.3	-	71.3
Medium Trucks:		.8	70.2		64.5		63		71.2	-	71.
Heavy Trucks:		l.1	71.7		68.7		68		75.0		75.3
Vehicle Noise:			75.7		71.6		70).1	77.7		78.
Centerline Distant	ce to Noise C	ontour (in feet)	70	04	07	-/04		0.104		-10.4
			L	70 0			dBA	6	0 dBA		dBA
	Ldn: CNEL						50		755		626
			170 366 788 1,697					097			

	FH	WA-RD-77-108	HIGHW	AY NC	DISE P	REDICT		DEL			
	io: Existing W e: Waterman nt: n/o Hospita	Av.					t Name: (lumber: '		ay South		
	SPECIFIC IN	NPUT DATA							L INPUT	s	
Highway Data				Si	ite Cor	nditions	: (Hard =	10, So	oft = 15)		
Peak H	Percentage: our Volume:	25,708 vehicle 10% 2,571 vehicle					rucks (2 A Icks (3+ A		15 15 15		
	hicle Speed:	50 mph		Ve	ehicle	Mix					
Near/Far La	ne Distance:	60 feet			Veh	icleTyp	e	Day	Evening	Night	Daily
Site Data							Autos:	82.9%	7.1%	10.0%	89.25%
Bar	rier Height:	0.0 feet			Μ	ledium 1	rucks:	82.8%	5.6%	11.7%	6.56%
Barrier Type (0-W		0.0				Heavy 7	rucks:	69.3%	8.7%	22.0%	4.19%
Centerline Dis	st. to Barrier:	50.0 feet		N	oise S	ource E	levation	s (in f	et)		
Centerline Dist.	to Observer:	50.0 feet				Auto			,		
Barrier Distance	to Observer:	0.0 feet			Mediu	m Truck					
Observer Height (.	Above Pad):	5.0 feet				vy Truck)04	Grade Ad	iustmen	t: 0.0
Pa	ad Elevation:	0.0 feet				·					
Roa	ad Elevation:	0.0 feet		Lá	ane Eq	uivalen	t Distand	:e (in	feet)		
F	Road Grade:	0.0%				Auto	os: 40.3	311			
	Left View:	-90.0 degre	es		Mediu	m Truck	ks: 40.0)91			
	Right View:	90.0 degre	es		Hea	vy Trucł	(s: 40.1	113			
FHWA Noise Mode	el Calculation	IS									
VehicleType	REMEL	Traffic Flow	Dista	nce	Finite	Road	Fresn	el	Barrier Att	en Be	rm Atten
Autos:	70.20	1.31		1.30		-1.20		-4.65	0.0	000	0.000
Medium Trucks:	81.00	-10.02		1.34		-1.20		-4.87	0.0	000	0.000
Heavy Trucks:	85.38	-11.97		1.33		-1.20		-5.43	0.0	000	0.000
Unmitigated Noise	e Levels (with	out Topo and	barrier	attenu	ation)						
VehicleType	Leq Peak Ho	ur Leq Day	/ L	eq Eve	ening	Leq	Night		Ldn	C	NEL
Autos:	71	1.6	70.0		65.4		62.1		70.6	;	70.9
Medium Trucks:	71	1.1	69.5		63.8		62.2		70.4	ļ.	70.7
Heavy Trucks:	73	3.5	71.2		68.2		67.4		74.5	i	74.7
Vehicle Noise:	77	7.0	75.0		70.9		69.4		77.0)	77.3
Centerline Distance	ce to Noise C	ontour (in feet)								
				70 dE			dBA	6	60 dBA		5 dBA
			Ldn:	147			817		683		,472
	CNEL:					3	331		713	1	,536

Monday, April 17, 2017

Monday, April 17, 2017

	FHWA	-RD-77-108 HIG	HWAY N	IOISE PI	REDICTION	N MODEL						
	p: Existing With					ame: Gate						
	e: Waterman Av	-			Job Num	ber: 1018	9					
Road Segmen	t: s/o Hospitality	'Ln.										
	SPECIFIC INP	UT DATA		NOISE MODEL INPUTS Site Conditions (Hard = 10, Soft = 15)								
Highway Data				Site Con	ditions (H	ard = 10, S	Soft = 15)					
Average Daily	Fraffic (Adt): 41	,128 vehicles				Autos	: 15					
Peak Hour I	Percentage:	10%		Me	dium Truck	is (2 Axles): 15					
Peak Ho	our Volume: 4,	113 vehicles		He	avy Trucks	(3+ Axles): 15					
Vet	nicle Speed:	50 mph		Vehicle	Mix							
Near/Far Lar	Near/Far Lane Distance: 60 feet				icleType	Day	Evening	Night	Daily			
Site Data					Aut		0	10.0%				
Par	rier Height:	0.0 feet		M	edium Truc	ks: 82.8	% 5.6%	11.7%	6.48%			
Barrier Type (0-Wa	•	0.0		ŀ	Heavy Truc	ks: 69.3	% 8.7%	22.0%	3.61%			
Centerline Dis		50.0 feet		Noise So	ource Elev	ations (in	feet)					
Centerline Dist. t		50.0 feet			Autos:	0.000			-			
Barrier Distance t		0.0 feet		Mediu	m Trucks:	2.297						
	bserver Height (Above Pad): 5.0 feet			Heav	v Trucks:	8.004	Grade Ad	iustment.	: 0.0			
	d Elevation:	0.0 feet	_									
	d Elevation:	0.0 feet	1	Lane Eq	uivalent Di		feet)					
F	Road Grade:	0.0%			Autos:	40.311						
		90.0 degrees			m Trucks:	40.091						
	Right View:	90.0 degrees		Heav	y Trucks:	40.113						
FHWA Noise Mode												
VehicleType			istance			Fresnel	Barrier Att		m Atten			
Autos:	70.20	3.38	1.30		-1.20	-4.65			0.000			
Medium Trucks:	81.00	-8.04	1.34		-1.20	-4.87		000	0.000			
Heavy Trucks:	85.38	-10.58	1.3		-1.20	-5.43	0.0	000	0.000			
Unmitigated Noise				<i></i>								
VehicleType Autos:	Leq Peak Hour 73.7	Leq Day 72.1	Leq E	ening 67.4	Leq Nig	9nt 64.1	Ldn 72.7		NEL 73.0			
	73.1	72.1		65.8		64.1	72.4		73.0			
Medium Trucks:	73.1	71.5		69.6		68.8	72.4		72.			
Heavy Trucks: Vehicle Noise:	74.9	72.6		69.6 72.6		68.8 71.1	75.9		76.7			
				12.6		71.1	78.7		79.			
Centerline Distanc	e to Noise Con	tour (in feet)	70 0	'BA	65 dB	A	60 dBA	55	dBA			
		Ldn:	19		411		886		909			
		CNEL:		199 429 925					992			
								.,				

	FHW	A-RD-77-108 F	IIGHW	AY NO	DISE PRED	ICTIC	ON MOI	DEL					
Scenario: Ex Road Name: Au	uto Center I	Rd.					lame: (mber: 1		ay South				
Road Segment: e/e	o I-215 Fwy	Ι.											
SITE SPEC	CIFIC INP	UT DATA							L INPUT	s			
Highway Data				Site Conditions (Hard = 10, Soft = 15)									
Average Daily Traffic	c (Adt): 3	9,205 vehicles		Autos: 15									
Peak Hour Perce	entage:	10%			Mediur	n Truc	cks (2 A	xles):	15				
Peak Hour V	olume: 3	,921 vehicles			Heavy	Truck	(3+ A	xles):	15				
Vehicle		40 mph		V	ehicle Mix								
Near/Far Lane Dis	stance:	60 feet		-	Vehicle	Tvpe		Day	Evening	Night	Daily		
Site Data						AL	itos:	, 82.9%	7.1%	10.0%			
Barrier H	leiaht [.]	0.0 feet			Mediu	m Tru	icks:	82.8%	5.6%	11.7%	6.46%		
Barrier Type (0-Wall, 1-	•	0.0			Hea	vy Tru	icks:	69.3%	8.7%	22.0%	3.689		
Centerline Dist. to I	,	50.0 feet			oise Sour		votion	lin fe	241				
Centerline Dist. to Ob	server:	50.0 feet		N		Autos:		5 (IN 16)00	et)				
Barrier Distance to Ob	server:	0.0 feet			Medium T			297					
Observer Height (Abov	e Pad):	5.0 feet			Heavy T			.97)04	Grade Ad	iustmont	0.0		
Pad Ele	evation:	0.0 feet			neavy i	ucks.	0.0	104	Graue Au	usuneni.	0.0		
Road Ele	evation:	0.0 feet		L	ane Equiva	alent l	Distand	e (in i	feet)				
Road	Grade:	0.0%			,	Autos:	40.3	311					
Lei	ft View:	-90.0 degrees			Medium T								
Righ	t View:	90.0 degrees			Heavy T	rucks:	40.1	113					
FHWA Noise Model Cal													
		Traffic Flow	Distar		Finite Ro		Fresn		Barrier Att		m Atter		
Autos:	66.51	4.14		1.30		.20		-4.65		000	0.00		
Medium Trucks:	77.72	-7.29		1.34		.20		-4.87		000	0.00		
Heavy Trucks:	82.99	-9.73		1.33	-1	.20		-5.43	0.0	000	0.00		
Unmitigated Noise Lev			-		,								
, , ,	Peak Hour	Leq Day		eq Eve	0	Leq N	·		Ldn		VEL		
Autos:	70.8		9.1		64.5		61.2		69.7		70.		
Medium Trucks:	70.6		3.9		63.2		61.7		69.9		70		
Heavy Trucks:	73.4		1.0		68.0		67.3		74.3		74.		
Vehicle Noise:	76.5		4.6		70.5		69.1		76.6)	76		
Centerline Distance to	Noise Con	tour (in feet)		70 dl	24	65 d	DA	6	0 dBA	55	dBA		
		1	dn:	139		299		C	644		UDA 388		
		L		103	,		2		672	1,-	000		

	FHW	A-RD-77-108	HIGHV	VAY NO	DISE PRE	DICTION	MODEL							
	 D: Existing With Drange Sho t: e/o E St. 				Project Name: Gateway South Job Number: 10189									
SITE S	SPECIFIC IN	PUT DATA			NOISE MODEL INPUTS									
Highway Data				S	Site Conditions (Hard = 10, Soft = 15)									
Average Daily	Traffic (Adt):	32,061 vehicl	es				Autos	: 15						
Peak Hour I	Percentage:	10%			Medi	um Trucks	(2 Axles)							
Peak Ho	Peak Hour Volume: 3,206 vehicles					y Trucks	(3+ Axles)	: 15						
Vel	nicle Speed:	50 mph			ehicle Mi	x								
Near/Far Lar	e Distance:	60 feet		-	Vehici	eType	Day	Evening	Night	Daily				
Site Data						Auto	s: 82.9%	6 7.1%	10.0%	89.75%				
Bar	rier Height:	0.0 feet			Mea	lium Truck	s: 82.8%	6 5.6%	11.7%	6.46%				
Barrier Type (0-Wa		0.0			He	avy Truck	s: 69.3%	6 8.7%	22.0%	3.80%				
Centerline Dis		50.0 feet			laiaa Cau	rce Eleva	tiono (in i	[0.0.4]						
Centerline Dist. t	o Observer:	50.0 feet		14	oise sou	Autos:		eel)						
Barrier Distance t	arrier Distance to Observer: 0.0 feet				Medium		0.000							
Observer Height (Above Pad): 5.0 feet							2.297	Grade Ad	iustmont					
Pa	d Elevation:	0.0 feet			Heavy	Trucks:	8.004	Graue Au	usunen	. 0.0				
Roa	d Elevation:	0.0 feet		L	ane Equi	valent Dis	stance (in	feet)						
F	Road Grade:	0.0%				Autos:	40.311							
	Left View:	-90.0 degre	es		Medium	Trucks:	40.091							
	Right View:	90.0 degre	es		Heavy	Trucks:	40.113							
FHWA Noise Mode	l Calculations													
VehicleType	REMEL	Traffic Flow	Dista		Finite R		resnel	Barrier Att		m Atten				
Autos:	70.20	2.29		1.30		-1.20	-4.65		000	0.00				
Medium Trucks:	81.00	-9.13		1.34		-1.20	-4.87		000	0.00				
Heavy Trucks:	85.38	-11.44		1.33		-1.20	-5.43	0.0	000	0.00				
Unmitigated Noise														
	Leq Peak Hour			Leq Eve		Leq Nigl		Ldn		NEL				
Autos:	72.	-	71.0		66.4		63.0	71.6		71.				
Medium Trucks:	72.		70.4		64.7		63.1	71.3		71.				
Heavy Trucks:	74.		71.7		68.7		67.9	75.0		75.				
Vehicle Noise:	77.	-	75.8		71.7		70.1	77.8	3	78.				
Centerline Distanc	e to Noise Co	ntour (in feet)											
				70 dł	BA	65 dBA		60 dBA	1 55	dBA				
			느			0.5		700		0.40				
			Ldn: VFL :	164		354 370		763 796		643 715				

	FHW	/A-RD-77-108	HIGHW	AY NO	ISE PF	REDICTI	ON MOI	DEL				
Road Nan	rio: Existing Wit ne: Orange Sho ent: e/o Arrowhe	w Rd.					Name: 0 umber: 1		ay South			
SITE	SPECIFIC IN	PUT DATA				N	OISE N	IODE	L INPUTS	5		
Highway Data				Sit	te Con	ditions	(Hard =	10, Sc	oft = 15)			
Average Daily	Traffic (Adt):	25,283 vehicle	es				A	Autos:	15			
Peak Hour	Percentage:	10%			Me	dium Tru	icks (2 A	xles):	15			
Peak H	Hour Volume:	2,528 vehicles	3	Heavy Trucks (3+ Axles): 15								
Ve	ehicle Speed:	50 mph		Ve	hicle I	Mix						
Near/Far La	ane Distance:	60 feet				icleType		Day	Evening	Night	Daily	
Site Data								32.9%	•	10.0%		
Ba	rrier Height:	0.0 feet			Me	edium Tr	ucks:	32.8%	5.6%	11.7%	6.46%	
Barrier Type (0-V		0.0			ŀ	leavy Tr	ucks: (69.3%	8.7%	22.0%	3.97%	
<i>,</i> ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	ist. to Barrier:	50.0 feet		No	lee Ce	ource El	ovetions	lin fe	a4)			
Centerline Dist.	to Observer:	50.0 feet		NO	ise sc	Autos			el)			
Barrier Distance	to Observer:	0.0 feet				n Trucks	0.0					
Observer Height	(Above Pad):	5.0 feet				y Trucks			Grade Adj	ustmon	+ 0.0	
P	ad Elevation:				neav	y TTUCKS	. 0.0	104	Oldac Auj	usunen	. 0.0	
Ro	ad Elevation:	0.0 feet		La	ne Eq	uivalent	Distanc	e (in i	feet)			
	Road Grade:	0.0%				Autos		311				
	Left View:	-90.0 degree	es	1	Mediur	n Trucks	: 40.0	91				
	Right View:	90.0 degree	es		Heavy Trucks: 40.113							
FHWA Noise Mod	lel Calculations	;										
VehicleType	REMEL	Traffic Flow	Distan	ce	Finite	Road	Fresn	el	Barrier Atte	en Be	rm Atten	
Autos:	70.20	1.25		1.30	30 -1.20			-4.65 0.00		00	0.000	
Medium Trucks:	81.00	-10.16		1.34		-1.20		4.87	0.0	00	0.000	
Heavy Trucks:	85.38	-12.28		1.33		-1.20		-5.43	0.0	00	0.000	
Unmitigated Nois	e Levels (with	out Topo and	barrier a	ttenua	ation)							
VehicleType	Leq Peak Hou	r Leq Day	Le	eq Ever	ning	Leq I	Vight		Ldn	С	NEL	
Autos:	71.	6	70.0		65.3		62.0		70.5		70.9	
Medium Trucks:	71.	0	69.4		63.7		62.1		70.3		70.5	
Heavy Trucks:	73.	2	70.8		67.8		67.1		74.2		74.4	
Vehicle Noise:	76.	76.8 74.9			70.7		69.2		76.8		77.1	
Centerline Distan	ce to Noise Co	ntour (in feet)									
				70 dB,	A	65 0		6	i0 dBA		i dBA	
			Ldn:	143				662 1,425				
		CI	VEL:	149		32	21		691	1	,488	

Monday, April 17, 2017

	FH\	WA-RD-77-108	HIGH	NAY NO	DISE PF	REDICTION		EL						
Scenario	p: Existing W	ith Project				Project Na	ame: G	atewa	ay South					
Road Name	e: Orange Sh	ow Rd.				Job Num	ber: 1	0189						
Road Segmen	t: e/o Washir	ngton Av.												
	SPECIFIC IN	IPUT DATA			NOISE MODEL INPUTS Site Conditions (Hard = 10, Soft = 15)									
Highway Data				S	ite Con	ditions (H	ard = 1	0, So	ft = 15)					
Average Daily 1	Fraffic (Adt):	24,711 vehicl	es				A	utos:	15					
Peak Hour I	Percentage:	10%			Me	dium Truck	(2 A)	des):	15					
Peak He	our Volume:	2,471 vehicle	s		He	avy Trucks	(3+ A)	des):	15					
Veh	nicle Speed:	50 mph		V	ehicle I	Mix								
Near/Far Lar	Near/Far Lane Distance: 60 feet					cleType	E	Dav	Evening	Night	Daily			
Site Data						Aut	os: 8	2.9%	7.1%	10.0%				
Bar	rier Height:	0.0 feet			Me	edium Truc	ks: 8	2.8%	5.6%	11.7%	6.29%			
Barrier Type (0-Wa	•	0.0			ŀ	łeavy Truc	ks: 6	9.3%	8.7%	22.0%	3.17%			
Centerline Dis		50.0 feet		N	oise Sc	urce Elev	ations	(in fe	et)					
Centerline Dist. t		50.0 feet				Autos:	0.00		,					
	Barrier Distance to Observer: 0.0 feet			Mediur	n Trucks:	2.29	97							
0 (Observer Height (Above Pad): 5.0 feet			Heav	y Trucks:	8.00)4	Grade Adj	ustment	: 0.0				
	Pad Elevation: 0.0 feet				-									
	d Elevation:	0.0 feet		L	ane Equ	uivalent Di			eet)					
F	Road Grade:	0.0%				Autos:	40.3							
	Left View:	-90.0 degre				n Trucks:	40.0							
	Right View:	90.0 degre	es		Heav	y Trucks:	40.1	13						
FHWA Noise Mode		-												
VehicleType	REMEL	Traffic Flow	Dista	ance	Finite		Fresne		Barrier Atte		rm Atten			
Autos:	70.20	1.20		1.30		-1.20		4.65	0.0		0.000			
Medium Trucks:	81.00	-10.38		1.34		-1.20		4.87	0.0		0.000			
Heavy Trucks:	85.38			1.33		-1.20	~	5.43	0.0	00	0.000			
Unmitigated Noise		1				1	- let		I ala					
VehicleType Autos:	Leq Peak Hou 71		69.9	Leq Eve	65.3	Leq Nig	62.0		Ldn 70.5		NEL 70,3			
Medium Trucks:	70		69.9 69.1		63.4		61.9		70.5		70.			
Heavy Trucks:	70		69.1 69.8		66.8		66.0		70.1		70.			
Vehicle Noise:	76		09.0 74.4		70.1		68.5		76.2		76.			
Centerline Distanc	e to Noise C	ontour (in feel)								-			
			/	70 dl	BA	65 dB	A	6	0 dBA	55	dBA			
			Ldn:	130)	279			601	1,	296			
		C	NEL:				353							
										,				

• •	ow Rd. an Av. PUT DATA 21,366 vehicles 10%		Site Cor	Job Ni	umber:	10189	ay South							
Road Segment: e/o Waterm SITE SPECIFIC IN Highway Data Average Daily Traffic (Adt): Peak Hour Percentage: Peak Hour Volume:	an Av. PUT DATA 21,366 vehicles 10%		Site Cor	N	OISE									
SITE SPECIFIC IN Highway Data Average Daily Traffic (Adt): Peak Hour Percentage: Peak Hour Volume:	PUT DATA 21,366 vehicles 10%		Site Cor			/IODE		~						
Highway Data Average Daily Traffic (Adt): Peak Hour Percentage: Peak Hour Volume:	21,366 vehicles 10%		Site Cor			/ODE		c						
Average Daily Traffic (Adt): Peak Hour Percentage: Peak Hour Volume:	10%		Site Cor		NOISE MODEL INPUTS									
Peak Hour Percentage: Peak Hour Volume:	10%		Site Conditions (Hard = 10, Soft = 15)											
Peak Hour Volume:			Autos: 15											
			Me	dium Tru	icks (2 /	Axles):	15							
Vehicle Speed:	2,137 vehicles		He	avy Truc	ks (3+ /	(xles)	15							
	50 mph		Vehicle	Mix										
Near/Far Lane Distance:	60 feet			icleType		Day	Evening	Night	Daily					
Site Data				A	utos:	82.9%	7.1%	10.0%	90.52					
Barrier Height:	0.0 feet		М	edium Tr	ucks:	82.8%	5.6%	11.7%	6.37					
Barrier Type (0-Wall, 1-Berm):	0.0			Heavy Tr	ucks:	69.3%	8.7%	22.0%	3.11					
Centerline Dist. to Barrier:	50.0 feet		Nalas 0			- // 6								
Centerline Dist. to Observer:	50.0 feet		Noise S	ource El			eet)							
Barrier Distance to Observer:	0.0 feet		14-15	Autos m Trucks		000 297								
Observer Height (Above Pad):			т тискs /y Trucks		297 004	Grade Ad	iustmont							
Pad Elevation:	пеа	/y TTUCKS	. 0.	JU4	Graue Au	usuneni	0.0							
Road Elevation:	0.0 feet		Lane Eq	uivalent	Distan	ce (in i	feet)							
Road Grade:	0.0%			Autos	: 40.	311								
Left View:	-90.0 degrees		Mediu	m Trucks	: 40.	091								
Right View:	90.0 degrees		Hea	/y Trucks	: 40.	113								
FHWA Noise Model Calculation	S													
VehicleType REMEL	Traffic Flow	Distant	ce Finite	Road	Fresr	el	Barrier Att	en Ber	m Atter					
Autos: 70.20	0.57		1.30	-1.20		-4.65		000	0.00					
Medium Trucks: 81.00	-10.96		1.34	-1.20		-4.87		000	0.00					
Heavy Trucks: 85.38	-14.07		1.33	-1.20		-5.43	0.0	000	0.00					
Unmitigated Noise Levels (with		_	,											
VehicleType Leq Peak Hou		-	q Evening	Leq I	· ·		Ldn	-	NEL					
Autos: 70.		9.3	64.6		61.3		69.9		70					
Medium Trucks: 70.		3.6	62.9		61.3		69.5		69					
Heavy Trucks: 71.		9.1	66.1		65.3		72.4		72					
Vehicle Noise: 75		3.7	69.5		67.9)	75.5	Ď	75					
Centerline Distance to Noise Co	ontour (in feet)		70 -/04	05	104		0.104		-10.4					
		dn:	70 dBA 117	65 0	1BA 52	6	60 dBA 544		dBA 171					
	CNE		117 122	25			544 568		171 223					

		WA-RD-77-10			1010211		-	-						
	p: EA 2018								ay South					
	e: Washingto					Job N	umber:	10189						
Road Segmen	t: s/o Orange	e Show Rd.												
	SPECIFIC IN	NPUT DATA			NOISE MODEL INPUTS									
Highway Data					Site Conditions (Hard = 10, Soft = 15)									
Average Daily	, ,	500 vehic	les					Autos:	15					
Peak Hour I		10%			Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15									
	our Volume:	50 vehicle	es		He	avy Truc	:ks (3+	Axles):	15					
	nicle Speed:	25 mph			Vehicle I	Mix								
Near/Far Lar	ar Lane Distance: 12 feet			F	Vehi	icleType		Day	Evening	Night	Daily			
Site Data						A	Autos:	82.9%	7.1%	10.0%	90.45%			
Bar	rier Height:	0.0 feet			Me	edium Tr	ucks:	82.8%	5.6%	11.7%	6.42%			
	Barrier Type (0-Wall, 1-Berm): 0.0				F	leavy Tr	ucks:	69.3%	8.7%	22.0%	3.14%			
Centerline Dis	t. to Barrier:	30.0 feet		-	Noise Sc	urco El	ovatio	ne (in fe	nof)					
Centerline Dist. t	o Observer:	30.0 feet		-	10136 30	Autos		0.000						
Barrier Distance t	Barrier Distance to Observer: 0.0 feet					n Trucks		2.297						
Observer Height (/	Above Pad): 5.0 feet							.004	Grade Ad	iustmont				
Pad Elevation: 0.0 feet					Heav	y Trucks	s: 8	.004	Graue Auj	usuneni	. 0.0			
Roa	d Elevation:	0.0 feet			Lane Equ	uivalent	Dista	nce (in i	feet)					
F	Road Grade:	0.0%				Autos	s: 29	9.816						
	Left View:	-90.0 degre	ees		Medium Trucks: 29.518									
	Right View:	90.0 degre	ees		Heav	y Trucks	s: 29	9.547						
FHWA Noise Mode	l Calculation	IS												
VehicleType	REMEL	Traffic Flow	Di	stance	Finite	Road	Fres	inel	Barrier Att	en Ber	m Atten			
Autos:	58.73	-12.73	3	3.2	6	-1.20	.20 -4.49		0.0	000	0.00			
Medium Trucks:	70.80	-24.22	2	3.3	3	-1.20		-4.86	0.0	000	0.00			
Heavy Trucks:	77.97	-27.33	3	3.3	2	-1.20		-5.77	0.0	000	0.00			
Unmitigated Noise	Levels (with	out Topo and	d barn	ier atter	uation)									
11	Leq Peak Ho			Leq E	vening	Leq	Night		Ldn		NEL			
Autos:	48		46.5		41.8		38		47.0		47.			
Medium Trucks:		3.7	47.1		41.4		39		48.0		48.			
Heavy Trucks:	52	2.8	50.4		47.4		46	.6	53.7	,	54.			
Vehicle Noise: 55.1 53.1				49.2		48	.0	55.4	1	55.				
Centerline Distanc	e to Noise C	ontour (in fee	et)						-					
			Į		dBA		dBA	6	0 dBA		dBA			
			I dn:	1	3		7		15		32			
			NFI :				7		15		33			

	FH\	WA-RD-77-108	HIGHW	AY NC	DISE PI	REDICTIO	N MOI	DEL						
	p: EA 2018 e: Waterman t: s/o Orange					Project N Job Nur			ay South					
SITE S	SPECIFIC IN	IPUT DATA			NOISE MODEL INPUTS									
Highway Data				Si	te Con	ditions (H	lard =	10, So	ft = 15)					
Average Daily	Traffic (Adt):	26,500 vehicle	s				A	Autos:	15					
Peak Hour	Percentage:	10%			Me	dium Truc	ks (2 A	xles):	15					
Peak He	our Volume:	2,650 vehicles			He	avy Truck	s (3+ A	xles):	15					
Vel	nicle Speed:	50 mph		V	ehicle	Mix								
Near/Far Lar	ne Distance:	60 feet		-		icleType		Day	Evening	Night	Daily			
Site Data						Au	tos:	32.9%	7.1%	10.0%	90.45%			
Bar	rier Heiaht:	0.0 feet			M	edium Truc	cks: 1	82.8%	5.6%	11.7%	6.42%			
Barrier Type (0-Wa		0.0			1	Heavy True	cks: (69.3%	8.7%	22.0%	3.14%			
Centerline Dis		50.0 feet		N	oise So	ource Elev	ations	; (in fe	et)					
Centerline Dist. t		50.0 feet				Autos:	0.0	00	,					
Barrier Distance t		0.0 feet			Mediu	m Trucks:	2.2	97						
Observer Height (/	,	5.0 feet				v Trucks:	8.0	04	Grade Ad	justment	: 0.0			
	d Elevation:	0.0 feet		-					,					
	d Elevation:	0.0 feet		La	ane Eq	uivalent D			eet)					
F	Road Grade:	0.0%				Autos:	40.3							
	Left View:	-90.0 degree				m Trucks:	40.0							
	Right View:	90.0 degree	s		Heav	ry Trucks:	40.1	13						
FHWA Noise Mode	Calculation	s												
VehicleType	REMEL	Traffic Flow	Distar	ice	Finite	Road	Fresn	el I	Barrier Att	en Ber	rm Atten			
Autos:	70.20	1.50		1.30		-1.20		4.65	0.0	000	0.000			
Medium Trucks:	81.00	-9.99		1.34		-1.20		4.87	0.0	000	0.000			
Heavy Trucks:	85.38	-13.10		1.33		-1.20		-5.43	0.0	000	0.000			
Unmitigated Noise			barrier a	ttenu	ation)									
	Leq Peak Hou			eq Eve	v	Leq Ni	<u> </u>		Ldn		NEL			
Autos:	71		0.2		65.6		62.3		70.8		71.1			
Medium Trucks:	71		69.5		63.8		62.3		70.5		70.7			
Heavy Trucks:	72	.4	0.0		67.0		66.3		73.3	3	73.6			
Vehicle Noise:	76		4.7		70.4		68.8		76.5	5	76.8			
Centerline Distance	e to Noise C	ontour (in feet)	-											
				70 dE		65 dE			0 dBA		dBA			
			dn:		136 292				630 1,35					
		CNEL: 14				305 658				1,	417			

Monday, April 17, 2017

Monday, April 17, 2017

Scenario: EA 2018 Road Name: Waterman Av. Road Segment: s/o Dumas St.	Project Name: Gateway South Job Number: 10189
SITE SPECIFIC INPUT DATA	NOISE MODEL INPUTS
Highway Data	Site Conditions (Hard = 10, Soft = 15)
Average Daily Traffic (Adt): 24,200 vehicles	Autos: 15
Peak Hour Percentage: 10%	Medium Trucks (2 Axles): 15
Peak Hour Volume: 2,420 vehicles	Heavy Trucks (3+ Axles): 15
Vehicle Speed: 50 mph	Vehicle Mix
Near/Far Lane Distance: 60 feet	
Site Data	VehicleType Day Evening Night Day Autos: 82.9% 7.1% 10.0% 90.
	Medium Trucks: 82,8% 5,6% 11,7% 6.
Barrier Height: 0.0 feet	Heavy Trucks: 69.3% 8.7% 22.0% 3.
Barrier Type (0-Wall, 1-Berm): 0.0	Theavy Trucks. 69.3% 8.1% 22.0% 3.
Centerline Dist. to Barrier: 50.0 feet	Noise Source Elevations (in feet)
Centerline Dist. to Observer: 50.0 feet	Autos: 0.000
Barrier Distance to Observer: 0.0 feet	Medium Trucks: 2.297
Observer Height (Above Pad): 5.0 feet	Heavy Trucks: 8.004 Grade Adjustment: 0.0
Pad Elevation: 0.0 feet Road Elevation: 0.0 feet	Lane Equivalent Distance (in feet)
Road Elevation: 0.0 feet Road Grade: 0.0%	Autos: 40.311
Left View: -90.0 degrees	Medium Trucks: 40.091
Right View: 90.0 degrees	Heavy Trucks: 40.001
FHWA Noise Model Calculations	
VehicleType REMEL Traffic Flow	istance Finite Road Fresnel Barrier Atten Berm At
Autos: 70.20 1.11	1.30 -1.20 -4.65 0.000 0
Medium Trucks: 81.00 -10.38	1.34 -1.20 -4.87 0.000 0
Heavy Trucks: 85.38 -13.49	1.33 -1.20 -5.43 0.000 0
Unmitigated Noise Levels (without Topo and ba	
VehicleType Leq Peak Hour Leq Day	Leq Evening Leq Night Ldn CNEL
Autos: 71.4 69	
Medium Trucks: 70.8 69	
Heavy Trucks: 72.0 69	
Vehicle Noise: 76.2 74.	70.0 68.4 76.1
Centerline Distance to Noise Contour (in feet)	70 dBA 65 dBA 60 dBA 55 dBA
Ld	
CNE	
Che	155 207 619 1,534

	FHV	VA-RD-77-108	HIGHW	AY N	OISE PI	REDICTI	ION MC	DEL						
Road Nan	rio: EA 2018 ne: Waterman ent: s/o Park Ce						Name: umber:		ay South					
SITE	SPECIFIC IN	PUT DATA				N	OISE	MODE	L INPUT	s				
Highway Data				S	Site Conditions (Hard = 10, Soft = 15)									
Average Daily	Traffic (Adt):	30,700 vehicle	s	Autos: 15										
	Percentage:	10%			Me	dium Tru	icks (2	Axles):	15					
	our Volume:	3,070 vehicles			He	avy Truc	ks (3+	, Axles):	15					
Ve	hicle Speed:	50 mph		Vehicle Mix										
Near/Far La	ne Distance:	60 feet												
Site Data					VehicleType Day Evening Night Autos: 82.9% 7.1% 10.0%									
				_	M	- edium Tr		82.8%		11.7%	90.459 6.429			
	rrier Height:	0.0 feet				leavy Tr				22.0%				
Barrier Type (0-V	vall, 1-Berm): ist. to Barrier:	0.0 50.0 feet								22.070	0.14			
Centerline Di Centerline Dist.		50.0 feet		٨	Voise So	ource El	evatior	ns (in fe	eet)					
		0.0 feet				Autos		.000						
Barrier Distance to Observer: 0.0 feet Observer Height (Above Pad): 5.0 feet					Medium Trucks: 2.297 Heavy Trucks: 8,004 Grade Adjustment: 0.0									
Pad Elevation: 0.0 feet					Heav	y Trucks	s: 8	.004	Grade Ad	justment	0.0			
-	Pad Elevation: 0.0 feet				ane Eq	uivalent	Distar	ice (in	feet)					
	Road Grade:	0.0%		F		Autos		.311	,					
	Left View:	-90.0 degree	<u>د</u>		Mediu	n Trucks		.091						
	Right View:	90.0 degree			Heav	y Trucks	s: 40	.113						
FHWA Noise Mod	lel Calculation	s												
VehicleType	REMEL	Traffic Flow	Dista	nce	Finite	Road	Fres	nel	Barrier Att	en Ber	m Atter			
Autos:	70.20	2.14		1.30)	-1.20		-4.65	0.0	000	0.00			
Medium Trucks:		-9.35		1.34	ł	-1.20		-4.87	0.0	000	0.00			
Heavy Trucks:	85.38	-12.46		1.33	6	-1.20		-5.43	0.0	000	0.00			
Unmitigated Nois			-											
VehicleType	Leq Peak Hou			eq Ev	rening	Leq	Night		Ldn		VEL			
Autos:			0.8		66.2		62.		71.4		71			
Medium Trucks:			0.2		64.5		62.		71.1		71			
Heavy Trucks:			0.7		67.7		66.	-	74.0		74			
Vehicle Noise:			5.3		71.1		69.	5	77.1	1	77.			
Centerline Distan	ce to Noise Co	ontour (in feet)		70 d	IRΔ	65 /	dBA	6	0 dBA	55	dBA			
		,	.dn:	15			23		695		497			
			IEL:	15			23 37		725		497 563			
		Ch		10	-				. 20	1,				

Monday, April 17, 2017

Scenario: EA 2018				Project N	ame: Ga	ateway	South					
Road Name: Waterman Av.				Job Nur								
Road Segment: n/o Hospitality Ln.												
SITE SPECIFIC INPUT	DATA		NOISE MODEL INPUTS Site Conditions (Hard = 10, Soft = 15)									
Highway Data			Site Con	ditions (F		· · ·	,					
) vehicles					itos:	15					
Peak Hour Percentage: 10				dium Truc			15					
	vehicles		He	avy Truck	s (3+ Ax	les):	15					
	mph		Vehicle I	Mix								
Near/Far Lane Distance: 60	feet		Veh	icleType	D	ay I	vening	Night	Daily			
Site Data				Au	tos: 82	2.9%	7.1%	10.0%	90.45			
Barrier Height: 0.) feet		M	edium Tru	cks: 82	2.8%	5.6%	11.7%	6.42			
Barrier Type (0-Wall, 1-Berm): 0.0)		ŀ	Heavy Tru	cks: 69	9.3%	8.7%	22.0%	3.14			
Centerline Dist. to Barrier: 50.0) feet		Noise So	ource Elev	vations	in fee	<i>t</i>)					
Centerline Dist. to Observer: 50.0) feet	-		Autos:	0.00		9					
Barrier Distance to Observer: 0.0) feet		Modiu	m Trucks:	2.29	-						
Observer Height (Above Pad): 5.0 feet				v Trucks:	8.00		ade Adj	ustment	0.0			
) feet	_				-						
) feet	2	Lane Eq	uivalent E			et)					
Road Grade: 0.0				Autos:	40.31							
) degrees			m Trucks:	40.09							
Right View: 90.0) degrees		Heav	y Trucks:	40.11	3						
FHWA Noise Model Calculations												
		stance		Road	Fresnel		arrier Atte		m Atter			
Autos: 70.20	1.39	1.3	-	-1.20		.65	0.0		0.00			
Medium Trucks: 81.00	-10.10	1.3		-1.20		.87	0.0		0.00			
Heavy Trucks: 85.38	-13.22	1.3	-	-1.20	-5	.43	0.0	00	0.00			
Unmitigated Noise Levels (without To	· · · · · · · · · · · · · · · · · · ·											
	Leq Day	Leq E	vening	Leq Ni	·	L	.dn	÷.	VEL			
Autos: 71.7	70.1		65.4		62.1		70.7		71			
Medium Trucks: 71.0	69.4		63.7		62.2		70.3		70			
Heavy Trucks: 72.3	69.9		66.9		66.2		73.2		73			
Vehicle Noise: 76.5	74.6		70.3		68.7		76.4		76			
Centerline Distance to Noise Contour	(in feet)											
			dBA	65 dE			dBA		dBA			
	Ldn:	13	33	287		F	19	1.3	333			
	CNFL:		39	300		-	46		392			

FHWA-RD-77-108 HIGHWA	Y NOISE PREDICTION MODEL
Scenario: EA 2018 Road Name: Waterman Av. Road Segment: s/o Hospitality Ln.	Project Name: Gateway South Job Number: 10189
SITE SPECIFIC INPUT DATA	NOISE MODEL INPUTS
Highway Data	Site Conditions (Hard = 10, Soft = 15)
Average Daily Traffic (Adt): 41,800 vehicles	Autos: 15
Peak Hour Percentage: 10%	Medium Trucks (2 Axles): 15
Peak Hour Volume: 4,180 vehicles	Heavy Trucks (3+ Axles): 15
Vehicle Speed: 50 mph Near/Far Lane Distance: 60 feet	Vehicle Mix
Near/Far Lane Distance: 60 feet	VehicleType Day Evening Night Daily
Site Data	Autos: 82.9% 7.1% 10.0% 90.45%
Barrier Height: 0.0 feet	Medium Trucks: 82.8% 5.6% 11.7% 6.42%
Barrier Type (0-Wall, 1-Berm): 0.0	Heavy Trucks: 69.3% 8.7% 22.0% 3.14%
Centerline Dist. to Barrier: 50.0 feet	Noise Source Elevations (in feet)
Centerline Dist. to Observer: 50.0 feet	Autos: 0,000
Barrier Distance to Observer: 0.0 feet	Medium Trucks: 2,297
Observer Height (Above Pad): 5.0 feet	Heavy Trucks: 8.004 Grade Adjustment: 0.0
Pad Elevation: 0.0 feet	
Road Elevation: 0.0 feet	Lane Equivalent Distance (in feet)
Road Grade: 0.0%	Autos: 40.311
Left View: -90.0 degrees	Medium Trucks: 40.091
Right View: 90.0 degrees	Heavy Trucks: 40.113
FHWA Noise Model Calculations	
VehicleType REMEL Traffic Flow Distant	
Autos: 70.20 3.48	1.30 -1.20 -4.65 0.000 0.000
	1.34 -1.20 -4.87 0.000 0.000
Heavy Trucks: 85.38 -11.12	1.33 -1.20 -5.43 0.000 0.000
Unmitigated Noise Levels (without Topo and barrier and	ttenuation)
	q Evening Leq Night Ldn CNEL
Autos: 73.8 72.2	67.5 64.2 72.8 73.1
Medium Trucks: 73.1 71.5	65.8 64.3 72.4 72.7
Heavy Trucks: 74.4 72.0	69.0 68.3 75.3 75.6
Vehicle Noise: 78.6 76.7	72.4 70.8 78.5 78.8
Centerline Distance to Noise Contour (in feet)	
	70 dBA 65 dBA 60 dBA 55 dBA
Ldn:	184 396 854 1,839
CNEL:	192 414 891 1,920

Monday, April 17, 2017

	FH	WA-RD-77-108 HI	GHWAY I		REDICTIO		L		
	io: EA 2018 le: Auto Cente nt: e/o I-215 F				Project Na Job Num		teway South 189		
SITE	SPECIFIC IN	NPUT DATA			NO	ISE MO	DEL INPUT	s	
Highway Data				Site Con	ditions (H	ard = 10	, Soft = 15)		
	Traffic (Adt): Percentage: lour Volume:	39,600 vehicles 10% 3,960 vehicles			dium Truck avy Trucks		es): 15		
Ve	hicle Speed:	40 mph	-	Vehicle I	Mix				
Near/Far La	ne Distance:	60 feet	-		icleType	Da	v Evening	Night	Daily
Site Data				ven	Aut		9% 7.1%	10.0%	
	rier Height:	0.0 feet		Me	edium Truc	ks: 82	8% 5.6%	11.7%	
Barrier Type (0-W		0.0		ŀ	leavy Truc	ks: 69	.3% 8.7%	22.0%	3.14%
Centerline Dis	st. to Barrier:	50.0 feet	-	Noise So	ource Elev	ations (n feet)		
Centerline Dist. Barrier Distance Observer Height (to Observer:	50.0 feet 0.0 feet 5.0 feet		Mediur	Autos: n Trucks: v Trucks:	0.000	,	liustment	: 0.0
	ad Elevation:	0.0 feet	_						
	ad Elevation:	0.0 feet	_	Lane Eq	uivalent D		, ,		
1	Road Grade:	0.0%			Autos:	40.31			
	Left View: Right View:	-90.0 degrees 90.0 degrees			n Trucks: y Trucks:	40.09 ⁴			
FHWA Noise Mode	el Calculation	IS							
VehicleType	REMEL	Traffic Flow	Distance	Finite	Road	Fresnel	Barrier Att	en Ber	rm Atten
Autos:	66.51	4.21	1.3	0	-1.20	-4.	65 0.0	000	0.000
Medium Trucks:	77.72	-7.28	1.3	4	-1.20	-4.	87 0.0	000	0.000
Heavy Trucks:	82.99	-10.39	1.3	3	-1.20	-5.	43 0.0	000	0.000
Unmitigated Noise									
VehicleType	Leq Peak Ho			vening	Leq Nig		Ldn		NEL
Autos:).8 69		64.6		61.3	69.8		70.1
Medium Trucks:		0.6 69		63.3		61.7	69.9		70.1
Heavy Trucks:		2.7 70.		67.4		66.6	73.		73.9
Vehicle Noise:		6.3 74	.3	70.2		68.7	76.3	3	76.6
Centerline Distant	ce to Noise C	ontour (in feet)	70						10.4
				dBA	65 dB	A	60 dBA		dBA
		Ld		31	283		610		315
		CNE	L: 1:	37	296		637	1,	372

	FHV	VA-RD-77-108	HIGHW	AY N	DISE PF	REDICTI	ION MO	DEL							
	io: EA 2018 ne: Orange Sho nt: e/o E St.	ow Rd.					Name: umber:		ay South						
-	SPECIFIC IN	PUT DATA				N	OISE	NODE	L INPUT	s					
Highway Data	0. 2011 10 11	01 5/11/1		s	ite Con				oft = 15						
Average Daily	Traffic (Adt):	32,100 vehicle	s					Autos:	15						
• •	Percentage:	10%			Medium Trucks (2 Axles): 15										
	lour Volume:	3.210 vehicles	;		Heavy Trucks (3+ Axles): 15										
Ve	hicle Speed:	50 mph			ehicle I			,							
Near/Far La	ne Distance:	60 feet		V				Day	Evening	Night	Daily				
Site Data							82.9%	•	10.0%						
					M	ر edium Ti		82.8%		11.7%	6.429				
	rrier Height:	0.0 feet				leavy Tr		69.3%		22.0%					
Barrier Type (0-V	. ,	0.0			,	ieavy II	uchs.	09.3%	0.170	22.0%	3.147				
	st. to Barrier:	50.0 feet		N	Noise Source Elevations (in feet)										
Centerline Dist.		50.0 feet				Autos	s: 0.	000							
Barrier Distance		0.0 feet			Mediur	n Trucks	s: 2.:	297							
Observer Height	· ,	5.0 feet			Heav	y Trucks	s: 8.	004	Grade Ad	justment.	0.0				
	ad Elevation:	0.0 feet			ane Equ		Distan	//	(4)						
	ad Elevation:	0.0 feet		-	апе Ец	Auto			eel)						
	Road Grade:	0.0%				n Truck		311 091							
	Left View:	-90.0 degree				n Trucks v Trucks		113							
	Right View:	90.0 degree	s		neav	у писк	5. 40.	115							
FHWA Noise Mod	el Calculation	s													
VehicleType	REMEL	Traffic Flow	Dista	nce	Finite	Road	Fresr	nel	Barrier Att	en Ber	m Atten				
Autos:	70.20	2.33		1.30		-1.20		-4.65	0.0	000	0.00				
Medium Trucks:	81.00	-9.16		1.34		-1.20		-4.87	0.0	000	0.00				
Heavy Trucks:	85.38	-12.27		1.33		-1.20		-5.43	0.0	000	0.00				
Unmitigated Nois	e Levels (with	out Topo and I	barrier	attenı	uation)										
VehicleType	Leq Peak Hou	r Leq Day	L	.eq Ev	ening	Leq	Night		Ldn		VEL				
Autos:	72		71.0		66.4		63.1		71.6		72.				
Medium Trucks:			70.4		64.7		63.1		71.3		71.				
Heavy Trucks:			70.9		67.9		67.1		74.2		74.				
Vehicle Noise:	77	.4 7	75.5		71.3		69.7	7	77.3	3	77.				
Centerline Distance to Noise Contour (in feet)															
				70 di					60 dBA		dBA				
			.dn:	154			32		716		542				
			IEL:	161			47		747		610				

	FH	WA-RD-77-108	HIGH	IWAY N		REDICT		ODEL							
Road Nam	io: EA 2018 ne: Orange Sh nt: e/o Arrowh							: Gatew : 10189	ay South						
	SPECIFIC I	NPUT DATA							L INPUT	s					
Highway Data				4	Site Conditions (Hard = 10, Soft = 15)										
Average Daily	Traffic (Adt):	25,200 vehicl	es		Autos: 15										
	Percentage:	10%			Medium Trucks (2 Axles): 15 Heavy Trucks (3+ Axles): 15										
	lour Volume:	2,520 vehicle	s		He	avy Tru	icks (3+	- Axles):	15						
	hicle Speed:	50 mph			Vehicle	Mix									
Near/Far La	ne Distance:	60 feet			Veh	icleTyp	е	Day	Evening	Night	Daily				
Site Data						10.0%	90.45%								
Ra	rrier Heiaht:	0.0 feet			М	edium 1	rucks:	82.8%	5.6%	11.7%	6.42%				
Barrier Type (0-W		0.0			Heavy Trucks: 69.3% 8.7% 22.0% 3.1										
Centerline Di	st. to Barrier:	50.0 feet			Noise Source Elevations (in feet)										
Centerline Dist.		50.0 feet 0.0 feet				Auto		0.000	,						
Barrier Distance		Mediu	m Truck	s:	2.297										
Observer Height (Heav	/v Truck	(S:)	3.004	Grade Ad	iustment	: 0.0							
	Pad Elevation: 0.0 feet														
	ad Elevation:	0.0 feet		4	Lane Eq			nce (in	teet)						
	Road Grade:	0.0%				Auto		0.311							
	Left View: Right View:	-90.0 degre 90.0 degre				m Trucl /y Trucl		0.091 0.113							
FHWA Noise Mod	ol Calculation	-													
VehicleType	REMEL	Traffic Flow	Dis	stance	Finite	Road	Fre	snel	Barrier Att	en Ber	m Atten				
Autos:	70.20	1.28		1.30)	-1.20		-4.65	0.0	000	0.00				
Medium Trucks:	81.00	-10.21		1.34	4	-1.20		-4.87	0.0	000	0.00				
Heavy Trucks:	85.38	-13.32		1.3	3	-1.20		-5.43	0.0	000	0.00				
Unmitigated Nois															
VehicleType	Leq Peak Ho			Leg E	vening	Leq	Night		Ldn		NEL				
Autos:		.6	70.0		65.3		62		70.6		70.				
Medium Trucks:			69.3		63.6		62		70.2	-	70.				
Heavy Trucks:		2.2	69.8		66.8		66		73.1		73.				
Vehicle Noise:			74.5		70.2		68	3.6	76.3	3	76.				
Centerline Distan	ce to Noise C	ontour (in feet	t)	-							10.4				
			L	70 0			dBA	6	0 dBA		dBA				
			Ldn:	13		-	283		609		312				
		C	NFI :	13	57		95		636	1	370				

barrier neight. 0.0 leet	
Highway Data Site Conditions (Hard = 10, Soft = 15) Average Daily Traffic (Adt): 24,800 vehicles Autos: 15 Peak Hour Percentage: 10% Medium Trucks (2 Axles): 15 Peak Hour Volume: 2,480 vehicles Vehicle Mix Vehicle Speed: 50 mph Vehicle Type Day Site Data Autos: 82.9% 7.1% 10.0% 90. Barrier Height: 0.0 feet Medium Trucks: 82.8% 5.6% 11.7% 6.	
Average Daily Traffic (Adt): 24,800 vehicles Autos: 15 Peak Hour Percentage: 10% Medium Trucks (2 Axles): 15 Peak Hour Volume: 2,480 vehicles Heavy Trucks (3+ Axles): 15 Vehicle Speed: 50 mph Vehicle Mix Vehicle Type Day Evening Night Date Site Data Autos: 82.8% 5.6% 11.7% 6.	
Deak Hour Percentage: 10% Medium Trucks (2 Axles): 15 Peak Hour Volume: 2,480 vehicles Heavy Trucks (3+ Axles): 15 Vehicle Speed: 50 mph Vehicle Mix Vehicle Type Day Evening Night Da Site Data Autos: 82.9% 7.1% 10.0% 90. Barrier Height: 0.0 feet Medium Trucks: 82.8% 5.6% 11.7% 6.	
Beak Hour Volume: 2,480 vehicles Heavy Trucks (3+ Axles): 15 Vehicle Speed: 50 mph Vehicle Mix Vehicle Type Day Evening Night Dic Site Data Autos: 82.9% 7.1% 10.0% 90. Barrier Height: 0.0 feet Medium Trucks: 82.8% 5.6% 11.7% 6.	
Vehicle Speed: 50 mph Near/Far Lane Distance: 60 feet Vehicle Mix Vehicle Type Site Data Autos: Barrier Height: 0.0 feet	
Near/Far Lane Distance: 60 feet Venicle wix Venicle wix Night Distance: Site Data Autos: 82.9% 7.1% 10.0% 90. Barrier Height: 0.0 feet Medium Trucks: 82.8% 5.6% 11.7% 6.	
Near/Far Lane Distance: 60 feet VehicleType Day Evening Night Dag Site Data Autos: 82.9% 7.1% 10.0% 90. Barrier Height: 0.0 feet Medium Trucks: 82.8% 5.6% 11.7% 6.	
Site Data Autos: 82.9% 7.1% 10.0% 90. Barrier Height: 0.0 feet Medium Trucks: 82.8% 5.6% 11.7% 6.	
Barrier Height: 0.0 feet Medium Trucks: 82.8% 5.6% 11.7% 6.	
Barner Height: 0.0 feet	43%
Barrier Type (0.Wall 1-Berm): 0.0 Heavy Trucks: 69.3% 8.7% 22.0% 3.	42 /0 14%
Damer Type (0-Waii, 1-Dem). 0.0	1470
Centerline Dist. to Barrier: 50.0 feet Noise Source Elevations (in feet)	
Centerline Dist. to Observer: 50.0 feet Autos: 0.000	
Barrier Distance to Observer: 0.0 feet Medium Trucks: 2.297	
Observer Height (Above Pad): 5.0 feet Heavy Trucks: 8.004 Grade Adjustment: 0.0	
Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Lane Equivalent Distance (in feet)	
0.070	
Right View: 90.0 degrees Heavy Trucks: 40.113	
FHWA Noise Model Calculations	
VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berm At	ten
	.000
	.000
Heavy Trucks: 85.38 -13.39 1.33 -1.20 -5.43 0.000 0	.000
Unmitigated Noise Levels (without Topo and barrier attenuation)	
VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL	
	70.8
	70.4
Heavy Trucks: 72.1 69.7 66.7 66.0 73.1	73.3
Vehicle Noise: 76.3 74.4 70.1 68.5 76.2	76.5
Centerline Distance to Noise Contour (in feet)	
70 dBA 65 dBA 60 dBA 55 dBA	
Ldn: 130 280 603 1,299	
CNEL: 136 292 629 1.356	

Monday, April 17, 2017

Monday, April 17, 2017

	FHV	VA-RD-77-108 F	IIGHWA	Y NC	ISE PR	EDICTIO	N MO	DEL			
	: EA 2018 : Orange Sho : e/o Waterm					Project Na Job Nun			ay South		
SITE S	PECIFIC IN	PUT DATA		1		NO	ISE N	IODE	L INPUT	s	
Highway Data				Si	te Con	ditions (H	lard =	10, Sc	oft = 15)		
Average Daily T	raffic (Adt):	21.800 vehicles					,	Autos:	15		
Peak Hour P	Percentage:	10%			Med	dium Truci	ks (2 A	xles):	15		
Peak Ho	ur Volume:	2.180 vehicles			Hea	avy Trucks	s (3+ A	xles):	15		
Veh	icle Speed:	50 mph		16	hists 4			-			
Near/Far Lan	e Distance:	60 feet		Ve	hicle I	nix cleType		Dav	Evening	Night	Dailv
Site Data				_	veni	1		Day 82.9%	•	10.0%	
				-	M	Aui dium Truc		oz.9% 82.8%		11.7%	
	ier Height:	0.0 feet				leavy Truc		o∠.o% 69.3%		22.0%	
Barrier Type (0-Wa	. ,	0.0				icavy mac	<i>n</i>	09.376	0.770	22.070	3.147
Centerline Dist		50.0 feet		No	oise So	urce Elev	ation	s (in fe	et)		
Centerline Dist. to Barrier Distance to		50.0 feet 0.0 feet				Autos:	0.0	000			
		5.0 feet			Mediur	n Trucks:	2.2	297			
Observer Height (A	d Flevation:	0.0 feet			Heav	y Trucks:	8.0	004	Grade Ad	justment	: 0.0
	d Elevation:	0.0 feet		1.	no Eau	ivalent D	lictory	o (in i	foot)		
	oad Grade:	0.0%			ne Ly	Autos:	40.3		000		
T.	Left View:	-90.0 degrees			Modiur	n Trucks:	40.				
i.	Right View:	90.0 degrees				y Trucks:	40.				
FHWA Noise Model	Calculation	s									
VehicleType	REMEL	Traffic Flow	Distanc	е	Finite	Road	Fresn	el	Barrier Att	en Bei	rm Atten
Autos:	70.20	0.65	1	.30		-1.20		-4.65	0.0	000	0.00
Medium Trucks:	81.00	-10.84	1	.34		-1.20		-4.87	0.0	000	0.00
Heavy Trucks:	85.38	-13.95	1	.33		-1.20		-5.43	0.0	000	0.00
Unmitigated Noise											
	eq Peak Hou	1.1.7		Eve	ning	Leq Ni	·		Ldn		NEL
Autos:	71		9.4		64.7		61.4		69.9		70.3
Medium Trucks:	70		3.7		63.0		61.4		69.6	-	69.9
Heavy Trucks:	71		9.2		66.2		65.4		72.5		72.8
Vehicle Noise:	75		3.9		69.6		68.0		75.7	7	75.
Centerline Distance	e to Noise Co	ontour (in feet)	7	'0 dF	A	65 dF	A	6	0 dBA	55	dBA
		1.	dn:	119		257			553		192
		CNI		124		268			577		244
		0.11		.24		200					

FH	WA-RD-77-108 H	IGHWAY	NOISE PR	REDICTIC	N MODE	iL		
Scenario: EAP 2018				Project N	lame: Ga	ateway South		
Road Name: Washingto	on Av.			Job Nu	nber: 10	189		
Road Segment: s/o Orang	e Show Rd.							
SITE SPECIFIC I	NPUT DATA					DEL INPUT	'S	
Highway Data			Site Con	ditions (F	lard = 10), Soft = 15)		
Average Daily Traffic (Adt):	773 vehicles				Au	tos: 15		
Peak Hour Percentage:	10%		Me	dium Truc	ks (2 Axl	es): 15		
Peak Hour Volume:	77 vehicles		He	avy Truck	s (3+ Axl	es): 15		
Vehicle Speed:	25 mph		Vehicle I	Mix				
Near/Far Lane Distance:	12 feet			icleType	Da	ay Evening	Night	Daily
Site Data				Au	tos: 82	.9% 7.1%	10.0%	58.50%
Barrier Height:	0.0 feet		Me	edium Tru	cks: 82	.8% 5.6%	11.7%	11.919
Barrier Type (0-Wall, 1-Berm):	0.0		F	leavy Tru	cks: 69	.3% 8.7%	22.0%	29.589
Centerline Dist. to Barrier:	30.0 feet		Noine Co	ource Ele	untiene (in fact)		
Centerline Dist. to Observer:	30.0 feet		Noise Sc	Autos:		,		
Barrier Distance to Observer:	0.0 feet		Modiu	n Trucks:				
Observer Height (Above Pad):	5.0 feet			v Trucks:			djustment	. 0.0
Pad Elevation:	0.0 feet						ijaounom	. 0.0
Road Elevation:	0.0 feet		Lane Eq	uivalent L	Distance	(in feet)		
Road Grade:	0.0%			Autos:				
Left View:	-90.0 degrees			m Trucks:				
Right View:	90.0 degrees		Heav	y Trucks:	29.54	7		
FHWA Noise Model Calculatio	ns		1					
VehicleType REMEL	Traffic Flow	Distance	e Finite	Road	Fresnel	Barrier A	ten Bei	m Atter
Autos: 58.73			.26	-1.20			000	0.00
Medium Trucks: 70.80			.33	-1.20			000	0.00
Heavy Trucks: 77.9	-15.69	3	.32	-1.20	-5.	.77 0	000	0.00
Unmitigated Noise Levels (with			,					
VehicleType Leq Peak Ho			Evening	Leq N	•	Ldn		NEL
	8.1 46		41.8		38.5	47		47.
		.7	46.0 59.0		44.4 58.3	52 65		52 65
	4.4 62 4.8 62		59.0		58.5	65	-	65.
		2.5	59.3		58.5	60	0	60
Centerline Distance to Noise C	Contour (in feet)	7	0 dBA	65 dl	54	60 dBA	E 6	dBA
		dn:	0 dBA 15	65 di 33		60 dBA 71		dBA 53
		111. =[_:	15	34		74		60

	WAY NOISE PRED	DIG TION MODEL		
Scenario: EAP 2018		oject Name: Gatewa	y South	
Road Name: Waterman Av.	J	ob Number: 10189		
Road Segment: s/o Orange Show Rd.				
SITE SPECIFIC INPUT DATA		NOISE MODEL		
Highway Data	Site Conditi	ions (Hard = 10, So	ft = 15)	
Average Daily Traffic (Adt): 27,310 vehicles		Autos:	15	
Peak Hour Percentage: 10%		m Trucks (2 Axles):	15	
Peak Hour Volume: 2,731 vehicles	Heavy	Trucks (3+ Axles):	15	
Vehicle Speed: 50 mph	Vehicle Mix			
Near/Far Lane Distance: 60 feet	Vehicle	Type Day	Evening N	ight Daily
Site Data		Autos: 82.9%	7.1% 1	0.0% 90.60
Barrier Height: 0.0 feet	Mediu	Im Trucks: 82.8%	5.6% 1	1.7% 6.26
Barrier Type (0-Wall, 1-Berm): 0.0	Hea	vy Trucks: 69.3%	8.7% 2	2.0% 3.14
Centerline Dist. to Barrier: 50.0 feet	Noise Source	ce Elevations (in fe	et)	
Centerline Dist. to Observer: 50.0 feet		Autos: 0.000	.,	
Barrier Distance to Observer: 0.0 feet	Medium T	rucks: 2.297		
Observer Height (Above Pad): 5.0 feet	Heavy T	rucks: 8.004	Grade Adjust	ment: 0.0
Pad Elevation: 0.0 feet				
Road Elevation: 0.0 feet		alent Distance (in f	eet)	
Road Grade: 0.0%	-	Autos: 40.311		
Left View: -90.0 degrees	Medium T			
Right View: 90.0 degrees	Heavy T	rucks: 40.113		
FHWA Noise Model Calculations				- ···
	tance Finite Ros	ad Fresnel I	Barrier Atten	Berm Atter
Autos: 70.20 1.64 Medium Trucks: 81.00 -9.97		1.20 -4.65 1.20 -4.87	0.000	0.00
Heavy Trucks: 81.00 -9.97 Heavy Trucks: 85.38 -12.96		1.20 -4.87 1.20 -5.43	0.000	
		-5.43	0.000	0.00
Unmitigated Noise Levels (without Topo and ba VehicleType Leg Peak Hour Leg Day	,	Leg Night	Ldn	CNEL
Autos: 71.9 70	65.7	62.4	70.9	71
Medium Trucks: 71.2 69	63.9	62.3	70.5	70
Heavy Trucks: 72.5 70	67.2	66.4	73.5	73
Vehicle Noise: 76.7 74	70.5	68.9	76.6	76
Centerline Distance to Noise Contour (in feet)	-		0 -10 4	55 dBA
Centerline Distance to Noise Contour (in feet)	70 dBA	65 dBA 6	0 dBA	55 UDA
Centerline Distance to Noise Contour (in feet)	70 dBA 138		641	1,380

	FH\	NA-RD-77-108	HIGH	WAY NO	DISE PI	REDICTIO		DEL			
	o: EAP 2018 e: Waterman t: s/o Dumas					Project N Job Nu	Vame: 0 mber: 1		ay South		
SITE S	SPECIFIC IN	IPUT DATA				N	DISE N	IODEL		5	
Highway Data				S	te Cor	ditions (l	Hard =	10, So	ft = 15)		
Average Daily	Traffic (Adt):	25,010 vehicle	es				A	utos:	15		
Peak Hour	Percentage:	10%			Me	dium Truc	cks (2 A	xles):	15		
Peak He	our Volume:	2,501 vehicle	5		He	avy Truck	ks (3+ A	xles):	15		
Vel	nicle Speed:	50 mph		V	ehicle	Mix					
Near/Far Lar	ne Distance:	60 feet		-		icleType		Day	Evening	Night	Daily
Site Data					VCI			32.9%	7.1%	10.0%	
Par	rier Heiaht:	0.0 feet			М	edium Tru	icks: 8	32.8%	5.6%	11.7%	6.24%
Barrier Type (0-Wa		0.0			1	Heavy Tru	icks: 6	69.3%	8.7%	22.0%	3.14%
Centerline Dis	t. to Barrier:	50.0 feet		N	oise S	ource Ele	vations	(in fe	et)		
Centerline Dist. t	o Observer:	50.0 feet			0.00 0	Autos			01)		
Barrier Distance t	o Observer:	0.0 feet			Madiu	m Trucks:	0.0				
Observer Height (/	Above Pad):	5.0 feet				v Trucks:			Grade Adj	ustment	0.0
Pa	d Elevation:	0.0 feet									
Roa	d Elevation:	0.0 feet		Li	ane Eq	uivalent l			eet)		
F	Road Grade:	0.0%				Autos:		11			
	Left View:	-90.0 degree	es			m Trucks:		91			
	Right View:	90.0 degree	es		Heav	y Trucks:	40.1	13			
FHWA Noise Mode	Calculation	s		-							
VehicleType	REMEL	Traffic Flow	Dist	ance	Finite	Road	Fresne	el E	Barrier Atte	en Ber	m Atten
Autos:	70.20	1.26		1.30		-1.20	-	4.65	0.0	00	0.000
Medium Trucks:	81.00	-10.36		1.34		-1.20		4.87	0.0		0.000
Heavy Trucks:	85.38	-13.34		1.33		-1.20	-	5.43	0.0	00	0.000
Unmitigated Noise											
21	Leq Peak Hou			Leq Eve		Leq N	•		Ldn		NEL
Autos:	71		70.0		65.3		62.0		70.5		70.9
Medium Trucks:	70		69.2		63.5		61.9		70.1		70.3
Heavy Trucks:	72		69.8		66.8		66.0		73.1		73.4
Vehicle Noise:	76		74.4		70.2		68.5		76.2		76.5
Centerline Distance	e to Noise C	ontour (in feet)								
			L	70 dE		65 d			0 dBA		dBA
			Ldn:	130		280	-		604		301
		CI	VEL:	136		293	3		631	1,	359

Monday, April 17, 2017

Monday, April 17, 2017

	FHV	VA-RD-77-108	HIGH	IWAY N	OISE PF	REDICTIO	ON MO	DEL			
Scenario:	EAP 2018					Project N	lame:	Gatew	ay South		
Road Name:						Job Nu	mber:	10189			
Road Segment:	s/o Park Ce	enter Dr.									
	ECIFIC IN	IPUT DATA							L INPUTS	S	
Highway Data				5	lite Con	ditions (l	Hard =	10, So	oft = 15)		
Average Daily Tra	ffic (Adt):	31,408 vehicle	es				,	Autos:	15		
Peak Hour Pe	rcentage:	10%			Me	dium Truc	cks (2 A	(xles)	15		
Peak Hou	r Volume:	3,141 vehicle	s		He	avy Truck	(3+ A	(xles)	15		
Vehic	le Speed:	50 mph		1	ehicle l	Mix					
Near/Far Lane	Distance:	60 feet		E F		cleType		Dav	Evening	Night	Dailv
Site Data							itos:	82.9%	0	10.0%	89.47%
Barrie	r Height:	0.0 feet			Me	edium Tru	icks:	82.8%	5.6%	11.7%	6.54%
Barrier Type (0-Wall,	•	0.0			ŀ	łeavy Tru	icks:	69.3%	8.7%	22.0%	4.00%
Centerline Dist. t	o Barrier:	50.0 feet		1	loise Sc	ource Ele	vation	s (in f	eet)		
Centerline Dist. to	Observer:	50.0 feet		-		Autos		000	,		
Barrier Distance to	Observer:	0.0 feet			Mediur	n Trucks:	2.3	297			
Observer Height (Ab	ove Pad):	5.0 feet			Heav	y Trucks:	80	004	Grade Adj	ustment	0.0
Pad	Elevation:	0.0 feet									
Road	Elevation:	0.0 feet		L	ane Equ	uivalent l			feet)		
	ad Grade:	0.0%				Autos:					
	Left View:	-90.0 degre	es			n Trucks:					
R	ight View:	90.0 degre	es		Heav	y Trucks:	40.	113			
FHWA Noise Model (Calculation	s									
	REMEL	Traffic Flow	Dis	tance	Finite		Fresn		Barrier Atte		rm Atten
Autos:	70.20	2.19		1.30		-1.20		-4.65	0.0	00	0.000
Medium Trucks:	81.00	-9.17		1.34		-1.20		-4.87	0.0		0.000
Heavy Trucks:	85.38	-11.31		1.33		-1.20		-5.43	0.0	00	0.00
Unmitigated Noise L											
1	q Peak Hoi			Leq Ev	· ·	Leq N	·		Ldn		NEL
Autos:	72		70.9		66.2		62.9		71.5		71.8
Medium Trucks:	72		70.4		64.7		63.1		71.3		71.
Heavy Trucks:	74		71.8		68.8		68.1		75.1		75.4
Vehicle Noise:	77		75.8		71.7		70.2		77.8	8	78.1
Centerline Distance	to Noise Co	ontour (in feet)	70 0	RΔ	65 d	RΔ	6	60 dBA	55	dBA
			I dn:	16		356			768		654
			NFL:	17	-	372	-		801		726
		C.	VLL.	17	0	512	-		001		120

	FHWA	-RD-77-108	HIGI	HWAY N	NOISE PF	REDICT	ION MO	DEL			
Scenario: EAP 2	018					Project	t Name:	Gatew	ay South		
Road Name: Water	man Av					Job N	lumber:	10189			
Road Segment: n/o Ho	ospitality	/ Ln.									
SITE SPECIF	IC INP	UT DATA							L INPUT	s	
Highway Data					Site Con	ditions	(Hard =	10, So	oft = 15)		
Average Daily Traffic (A	dt): 26	508 vehicle	es					Autos:	15		
Peak Hour Percenta	ge:	10%			Mee	dium Tr	ucks (2 A	(xles)	15		
Peak Hour Volu	ne: 2,	651 vehicle	5		Hea	avy Tru	cks (3+ A	(xles)	15		
Vehicle Spe	ed:	50 mph		-	Vehicle I	Nix					
Near/Far Lane Distan	ce:	60 feet		-		cleType	9	Day	Evening	Night	Daily
Site Data								82.9%	v	10.0%	
Barrier Heid	uht.	0.0 feet			Me	edium T	rucks:	82.8%	5.6%	11.7%	6.569
Barrier Type (0-Wall, 1-Ber		0.0			F	leavy T		69.3%		22.0%	
Centerline Dist. to Barr	·	50.0 feet		_							
Centerline Dist. to Obser		50.0 feet		_	Noise So				eet)		
Barrier Distance to Observ		0.0 feet				Auto		000			
Observer Height (Above Pa		5.0 feet			Mediur			297			
Pad Elevat		0.0 feet			Heav	y Truck	:s: 8.0	004	Grade Ad	justment	0.0
Road Elevat	0.0 feet		-	Lane Equ	uivalen	t Distan	ce (in	feet)			
	Road Elevation: 0.0 Road Grade: 0.0					Auto			,		
Left Vi	₽W: -	-90.0 degree	s		Mediur	n Truck	s: 40.	091			
Right Vi		90.0 degree			Heav	y Truck	s: 40.	113			
FHWA Noise Model Calcul	ations										
VehicleType REME	L T	raffic Flow	Di	stance	Finite	Road	Fresr	iel	Barrier Att	en Ber	m Atter
Autos: 7	0.20	1.45		1.3	0	-1.20		-4.65	0.0	000	0.00
	1.00	-9.89		1.3		-1.20		-4.87		000	0.00
Heavy Trucks: 8	5.38	-11.87		1.3	3	-1.20		-5.43	0.0	000	0.00
Unmitigated Noise Levels			-		·						
VehicleType Leq Pea		Leq Day		Leq E	vening	Leq	Night		Ldn	-	VEL
Autos:	71.8		70.1		65.5		62.2		70.7		71.
Medium Trucks:	71.2		69.6		63.9		62.4		70.6		70
Heavy Trucks:	73.6		71.3		68.3		67.5		74.6		74.
Vehicle Noise:	77.1		75.2		71.0		69.6	6	77.1		77.
Centerline Distance to Noi	se Con	tour (in feet)	70	dD A	65	dDA		C dBA		dD A
			Ldn:		dBA 50		dBA 23	6	695 695		dBA 498
			LUII.	13	JU	3	20		090	1,	+30

	FH	WA-RD-77-10	BHIGH	IWAY N	OISE PR	REDICT	ION MO	DDEL				
	o: EAP 2018 e: Waterman nt: s/o Hospita							Gatew 10189	ay South			
SITE S	SPECIFIC II	NPUT DATA				Ν	IOISE	MODE	L INPUT	s		
Highway Data				4	Site Con	ditions	(Hard :	= 10, So	oft = 15)			
Average Daily	Traffic (Adt):	42,328 vehic	les					Autos:	15			
Peak Hour	Percentage:	10%			Med	dium Tru	ucks (2	Axles):	15			
Peak H	our Volume:	4,233 vehicle	es		Hea	avy Truc	cks (3+	Axles):	15			
Vel	nicle Speed:	50 mph			Vehicle Mix							
Near/Far Lar	ne Distance:	60 feet		H	VehicleType Day Evening Night							
Site Data					Autos: 82.9% 7.1% 10.0%							
Bar	rier Height:	0.0 feet			Medium Trucks: 82.8% 5.6% 11.7%							
Barrier Type (0-W		0.0			H	leavy Ti	rucks:	69.3%	8.7%	22.0%	3.60%	
Centerline Dis	t. to Barrier:	50.0 feet			Voise So	urce Fl	evatio	ns (in fø	pet)			
Centerline Dist. I	o Observer:	50.0 feet		-	10.00 00	Auto		.000	,01)			
Barrier Distance t	o Observer:	0.0 feet			Modiur	n Truck	. 0	.297				
Observer Height (J	Above Pad):	5.0 feet				v Truck		.004	Grade Ad	iustment	· 0.0	
Pa	d Elevation:	0.0 feet				· · ·				uoumoni	. 0.0	
Roa	d Elevation:	0.0 feet		1	ane Equ				feet)			
F	Road Grade:	0.0%				Auto		.311				
	Left View:	-90.0 degre	ees			n Truck		.091				
	Right View:	90.0 degre	ees		Heav	y Truck	s: 40	.113				
FHWA Noise Mode	l Calculation	15										
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite		Fres	nel	Barrier Att	en Ber	m Atten	
Autos:	70.20	3.51		1.30)	-1.20		-4.65	0.0	000	0.00	
Medium Trucks:	81.00			1.34		-1.20		-4.87		000	0.00	
Heavy Trucks:	85.38	-10.47		1.33	3	-1.20		-5.43	0.0	000	0.00	
Unmitigated Noise	1				,							
21	Leq Peak Ho			Leq Ev	~	Leq	Night		Ldn		NEL	
Autos:		3.8	72.2		67.6		64		72.8	-	73.	
Medium Trucks:		3.2	71.6		65.9		64.		72.5	, ,	72.	
Heavy Trucks:		5.0	72.7		69.7		68	-	76.0	-	76.	
Vehicle Noise:		3.9	77.0		72.8		71.	.2	78.8	3	79.	
Centerline Distanc	e to Noise C	ontour (in fee	t)									
			. L	70 c			dBA	6	60 dBA		dBA	
			Ldn: NEL:	19 20			19 37		902 941		943 028	

	FH)	WA-RD-77-108	HIGHW	AY NO	DISE PF	REDICTIC	N MOI	DEL			
	o: EAP 2018 e: Auto Cente nt: e/o I-215 F					Project N Job Nur			ay South		
	SPECIFIC IN	NPUT DATA							L INPUTS	S	
Highway Data				S	ite Con	ditions (F	lard =	10, So	ft = 15)		
Average Daily	Traffic (Adt):	40,405 vehicl	es				/	Autos:	15		
Peak Hour	Percentage:	10%			Me	dium Truc	ks (2 A	xles):	15		
Peak H	our Volume:	4,041 vehicle	s		He	avy Truck	s (3+ A	xles):	15		
Vel	hicle Speed:	40 mph		V	ehicle I	Mix					
Near/Far Lar	ne Distance:	60 feet		-		icleType		Day	Evening	Night	Daily
Site Data				-	VCIII			82.9%	7.1%	10.0%	
Par	rier Heiaht:	0.0 feet			Me	edium Tru	cks:	82.8%	5.6%	11.7%	6.46%
Barrier Type (0-W		0.0			ŀ	leavy Tru	cks:	69.3%	8.7%	22.0%	3.66%
Centerline Dis	. ,	50.0 feet									
Centerline Dist.	to Observer:	50.0 feet		N	orse so	ource Ele			et)		
Barrier Distance	to Observer:	0.0 feet				Autos:	0.0				
Observer Height (J	Above Pad):	5.0 feet				n Trucks:	2.2		Out de Ad		
	d Elevation:	0.0 feet			Heav	y Trucks:	8.0	004	Grade Adj	ustment	0.0
Roa	d Elevation:	0.0 feet		L	ane Eq	uivalent L	Distand	e (in f	eet)		
F	Road Grade:	0.0%				Autos:	40.3	311			
	Left View:	-90.0 degre	es		Mediur	n Trucks:	40.0)91			
	Right View:	90.0 degre	es		Heav	y Trucks:	40.1	113			
FHWA Noise Mode	el Calculation	IS		- 1							
VehicleType	REMEL	Traffic Flow	Distan	се	Finite	Road	Fresn	el i	Barrier Atte	en Ber	m Atten
Autos:	66.51	4.27		1.30		-1.20		4.65	0.0	000	0.000
Medium Trucks:	77.72	-7.16		1.34		-1.20		-4.87	0.0	000	0.000
Heavy Trucks:	82.99	-9.62		1.33		-1.20		-5.43	0.0	000	0.000
Unmitigated Noise			barrier a	ttenu	ation)						
	Leq Peak Ho			q Eve	ening	Leq N	<u> </u>		Ldn		NEL
Autos:).9	69.3		64.6		61.3		69.9		70.2
Medium Trucks:			69.1		63.4		61.8		70.0		70.3
Heavy Trucks:		3.5	71.1		68.1		67.4		74.4		74.7
Vehicle Noise:		6.7	74.7		70.6		69.2		76.8	3	77.0
Centerline Distance	e to Noise C	ontour (in fee)								
				70 dl		65 di			0 dBA		dBA
		-	Ldn:	141		304			656		413
		C	NEL:	147	r	318	3		684	1,	475

Monday, April 17, 2017

Monday, April 17, 2017

	FHWA-R	D-77-108 HI	GHWAY	NOISE PI	REDICTIO		-		
Scenario: EAP 2 Road Name: Orang Road Segment: e/o E	e Show Ro	d.			Project Na Job Num		eway South 89		
SITE SPECIFI	C INPUT	DATA			NO	SE MO	DEL INPUT	s	
Highway Data				Site Con	ditions (H	ard = 10,	Soft = 15)		
Average Daily Traffic (A	<i>tt):</i> 32,9	61 vehicles				Aut	os: 15		
Peak Hour Percenta	je: 1	0%		Me	dium Truck	s (2 Axle	s): 15		
Peak Hour Volur	ne: 3,29	6 vehicles		He	avy Trucks	(3+ Axle	s): 15		
Vehicle Spe	ed: 5	0 mph		Vehicle	Mix				
Near/Far Lane Distan	ce: 6	0 feet			icleType	Da	/ Evening	Night	Daily
Site Data				10.1	Aut			10.0%	
Barrier Heig	ht- 0	.0 feet		M	edium Truc	ks: 82.	8% 5.6%	11.7%	6.46%
Barrier Type (0-Wall, 1-Ber		0.0		ŀ	Heavy Truc	ks: 69.	3% 8.7%	22.0%	3.78%
Centerline Dist. to Barr		.0 feet							
Centerline Dist. to Observ		0.0 feet		Noise So	ource Elev		n feet)		
Barrier Distance to Observ		0.0 feet			Autos:	0.000			
Observer Height (Above Pa	d): 5	0 feet			m Trucks:	2.297			
Pad Elevati	,	0.0 feet		Heav	y Trucks:	8.004	Grade Ad	justment:	0.0
Road Elevati	on: 0	0.0 feet		Lane Eq	uivalent D	istance (in feet)		
Road Gra	de: 0	0.0%			Autos:	40.311			
Left Vie	w: -90	0.0 degrees		Mediu	m Trucks:	40.091			
Right Vie	w: 90	0.0 degrees		Heav	y Trucks:	40.113			
FHWA Noise Model Calcula	tions								
VehicleType REME	Traf	fic Flow	Distance	Finite	Road	Fresnel	Barrier Att	en Ber	m Atten
Autos: 7	0.20	2.42	1.3	30	-1.20	-4.0	65 0.0	000	0.000
Medium Trucks: 8	1.00	-9.01	1.3	34	-1.20	-4.8	37 0.0	000	0.000
Heavy Trucks: 8	5.38	-11.34	1.3	33	-1.20	-5.4	43 0.0	000	0.000
Unmitigated Noise Levels	without T	opo and ba	rrier atte	nuation)					
VehicleType Leq Peal		Leq Day		vening	Leq Nig		Ldn		VEL
Autos:	72.7	71.		66.5		63.2	71.		72.0
Medium Trucks:	72.1	70.	-	64.8		63.2	71.4		71.7
Heavy Trucks:	74.2	71.	-	68.8		68.0	75.		75.4
Vehicle Noise:	77.9	75.	.9	71.8		70.2	77.9	9	78.1
Centerline Distance to Noi	e Contou	ır (in feet)	70	dBA	65 dB		60 dBA		dBA
		I di		dBA 67	65 dB 360	4	50 dBA 776		
		Lai CNFi		67 74	360		776 810		671 745
		CIVE	L. 1	/4	376		010	1,	/45

	FHV	VA-RD-77-108 I	HIGHW	AY N	DISE PI	REDICTI	ON MO	DEL					
	o: EAP 2018			Project Name: Gateway South									
	e: Orange Sho ht: e/o Arrowhe					Job Ni	umber:	10189					
SITE	SPECIFIC IN	IPUT DATA		NOISE MODEL INPUTS									
Highway Data				S	ite Con	ditions	(Hard =	10, Sc	oft = 15)				
Average Daily	Traffic (Adt):	26,083 vehicles	6					Autos:	15				
Peak Hour	Percentage:	10%			Me	dium Tru	icks (2 /	Axles):	15				
Peak H	our Volume:	2,608 vehicles			He	avy Truc	ks (3+)	Axles):	15				
Vel	hicle Speed:	50 mph		V	ehicle l	Mix							
Near/Far Lar	ne Distance:	60 feet		-		icleType		Day	Evening	Night	Daily		
Site Data								82.9%	•	10.0%			
	rier Height:	0.0 feet			Me	edium Tr		82.8%		11.7%	6.46%		
Barrier Type (0-W	•	0.0			ŀ	Heavy Tr	ucks:	69.3%	8.7%	22.0%			
Centerline Dis	. ,	50.0 feet											
Centerline Dist.		50.0 feet		۸	loise So	ource El			et)				
Barrier Distance		0.0 feet				Autos		000					
Observer Height (5.0 feet				m Trucks		297					
0 1	d Flevation:	0.0 feet			Heav	ry Trucks	:: 8.	004	Grade Ad	justment.	0.0		
Roa	d Elevation:	0.0 feet		L	ane Eq	uivalent	Distan	ce (in	feet)				
	Road Grade:	0.0%				Autos	: 40.	311	,				
	Left View:	-90.0 degree	6		Mediui	m Trucks	: 40.	091					
	Right View:	90.0 degree	6		Heav	y Trucks	: 40.	113					
FHWA Noise Mode	el Calculation	s											
VehicleType	REMEL	Traffic Flow	Dista	nce	Finite	Road	Fresr	nel	Barrier Att	en Ber	m Atten		
Autos:	70.20	1.39		1.30		-1.20		-4.65	0.0	000	0.00		
Medium Trucks:	81.00	-10.03		1.34		-1.20		-4.87	0.0	000	0.00		
Heavy Trucks:	85.38	-12.17		1.33		-1.20		-5.43	0.0	000	0.00		
Unmitigated Noise	Levels (with	out Topo and k	arrier	attenu	lation)								
21	Leq Peak Hou			eq Ev	· ·	Leq I	· ·		Ldn		VEL		
Autos:	71.		0.1		65.4		62.1		70.7		71.		
Medium Trucks:	71.		9.5		63.8		62.2	-	70.4		70.		
Heavy Trucks:	73.	-	1.0		68.0		67.2	-	74.3		74.		
Vehicle Noise:	76	.9 7	5.0		70.8		69.3	3	76.9	Э	77.		
Centerline Distanc	e to Noise Co	ontour (in feet)		70 d	DA I	65 0	JDA	6	0 dBA	55	dBA		
		,	dn:	70 a.		31		6	674		ава 452		
		CN		14		32			703		402 515		
		Ch		13.	-	32			100	1,-	515		

FHWA-RD-77-108 HIGH	HWAY NOISE PREDICTION MODEL									
Scenario: EAP 2018 Road Name: Orange Show Rd. Road Segment: e/o Washington Av.	Project Name: Gateway South Job Number: 10189									
SITE SPECIFIC INPUT DATA	NOISE MODEL INPUTS									
Highway Data	Site Conditions (Hard = 10, Soft = 15)									
Average Daily Traffic (Adt): 25,411 vehicles	Autos: 15									
Peak Hour Percentage: 10%	Medium Trucks (2 Axles): 15									
Peak Hour Volume: 2,541 vehicles	Heavy Trucks (3+ Axles): 15									
Vehicle Speed: 50 mph	Vehicle Mix									
Near/Far Lane Distance: 60 feet	VehicleType Day Evening Night Daily									
Site Data	Autos: 82.9% 7.1% 10.0% 90.54									
Barrier Height: 0.0 feet	Medium Trucks: 82.8% 5.6% 11.7% 6.30									
Barrier Type (0-Wall, 1-Berm): 0.0	Heavy Trucks: 69.3% 8.7% 22.0% 3.17									
Centerline Dist. to Barrier: 50.0 feet	Noise Source Elevations (in feet)									
Centerline Dist. to Observer: 50.0 feet	Autos: 0.000									
Barrier Distance to Observer: 0.0 feet	Medium Trucks: 2,297									
Observer Height (Above Pad): 5.0 feet	Heavy Trucks: 8.004 Grade Adjustment: 0.0									
Pad Elevation: 0.0 feet										
Road Elevation: 0.0 feet	Lane Equivalent Distance (in feet)									
Road Grade: 0.0%	Autos: 40.311									
Left View: -90.0 degrees	Medium Trucks: 40.091									
Right View: 90.0 degrees	Heavy Trucks: 40.113									
FHWA Noise Model Calculations										
	stance Finite Road Fresnel Barrier Atten Berm Atter									
Autos: 70.20 1.32	1.30 -1.20 -4.65 0.000 0.00									
Medium Trucks: 81.00 -10.25	1.34 -1.20 -4.87 0.000 0.00									
Heavy Trucks: 85.38 -13.24	1.33 -1.20 -5.43 0.000 0.00									
Unmitigated Noise Levels (without Topo and barri	er attenuation)									
	Les European Les Minht Lete ONEL									
VehicleType Leq Peak Hour Leq Day	Leq Evening Leq Night Ldn CNEL									
Autos: 71.6 70.0	65.4 62.1 70.6 70									
Autos: 71.6 70.0 Medium Trucks: 70.9 69.3	65.4 62.1 70.6 70 63.6 62.0 70.2 70									
Autos: 71.6 70.0	65.4 62.1 70.6 70									
Autos: 71.6 70.0 Medium Trucks: 70.9 69.3 Heavy Trucks: 72.3 69.9 Vehicle Noise: 76.4 74.5	65.4 62.1 70.6 70 63.6 62.0 70.2 70 66.9 66.1 73.2 73									
Autos: 71.6 70.0 Medium Trucks: 70.9 69.3 Heavy Trucks: 72.3 69.9	65.4 62.1 70.6 70 63.6 62.0 70.2 70 66.9 66.1 73.2 73									
Autos: 71.6 70.0 Medium Trucks: 70.9 69.3 Heavy Trucks: 72.3 69.9 Vehicle Noise: 76.4 74.5	65.4 62.1 70.6 70 63.6 62.0 70.2 70 66.9 66.1 73.2 73 70.3 68.6 76.3 76									

	FHWA-R	D-77-108 HIG	HWAY I	NOISE P	REDICTIO	N MODI	EL								
Road Name: Ora	Scenario: EAP 2018 Road Name: Orange Show Rd. Road Segment: e/o Waterman Av.						Project Name: Gateway South Job Number: 10189								
SITE SPECI	FIC INPUT	DATA					DEL INPU	TS							
Highway Data				Site Cor	nditions (H	lard = 1), Soft = 15)								
Average Daily Traffic	(Adt): 21,9	66 vehicles				AL	tos: 15								
Peak Hour Percen	tage: 1	0%		Me	edium Truc	ks (2 Ax	les): 15								
Peak Hour Vol	lume: 2,19	7 vehicles		He	eavy Truck	s (3+ Ax	les): 15								
Vehicle S	beed: 5	0 mph	-	Vehicle	Mix										
Near/Far Lane Dist	ance: 6	0 feet	ŀ		nicleType	D	ay Evening	Night	Daily						
Site Data				10.			2.9% 7.1%								
Barrier He	induti (0.0 feet		M	ledium Truc	cks: 82	2.8% 5.6%								
Barrier Type (0-Wall, 1-B	5	0.0 Teel			Heavy True	cks: 69	9.3% 8.7%	22.09	6 3.11%						
Centerline Dist, to Ba	,).0 feet	-		,										
Centerline Dist. to Obse		0.0 feet	-	Noise S	ource Elev										
Barrier Distance to Obse	erver: 0	0.0 feet			Autos:	0.00									
Observer Height (Above	Pad): 5	0 feet			m Trucks:	2.29									
Pad Elev	, .	0.0 feet		Hea	vy Trucks:	8.00	4 Grade A	djustmen	£ 0.0						
Road Elev	ation: (0.0 feet		Lane Eq	uivalent D	Distance	(in feet)								
Road G	rade: (0.0%	ſ		Autos:	40.31	1								
Left	View: -90	0.0 degrees		Mediu	m Trucks:	40.09	1								
Right	View: 90	0.0 degrees		Hea	vy Trucks:	40.11	3								
FHWA Noise Model Calc	ulations														
VehicleType REN	AEL Trai	fic Flow D	istance	Finite	Road	Fresnel	Barrier A	tten Be	erm Atten						
Autos:	70.20	0.69	1.3	0	-1.20	-4	.65 0	.000	0.000						
Medium Trucks:	81.00	-10.84	1.3	4	-1.20	-4	.87 0	0.000	0.000						
Heavy Trucks:	85.38	-13.95	1.3	3	-1.20	-5	.43 0	0.000	0.000						
Unmitigated Noise Level	s (without 1	opo and barr	rier atter	nuation)											
VehicleType Leq Pe	eak Hour	Leq Day	Leq E	vening	Leq Ni	ight	Ldn	0	ONEL						
Autos:	71.0	69.4		64.7		61.4	70		70.3						
Medium Trucks:	70.3	68.7		63.0		61.4	69		69.9						
Heavy Trucks:	71.6	69.2		66.2		65.4	72	-	72.8						
Vehicle Noise:	75.8	73.9		69.6		68.0	75	i.7	75.9						
Centerline Distance to N	oise Contou	ır (in feet)													
				dBA	65 dE		60 dBA		5 dBA						
		Ldn:		19	257		554		,193						
		CNEL:	1	25	268		578	1	,246						

Monday, April 17, 2017

Monday, April 17, 2017

	FHW	/A-RD-77-108	HIGHV	VAY NO	DISE PR	EDICTIO	N MOD	EL			
Scenario: EA0 Road Name: Wa Road Segment: s/o	shington					Project N Job Nur			ay South		
SITE SPEC	IFIC IN	PUT DATA				NC	ISE M	ODE		5	
Highway Data				S	ite Con	ditions (H				-	
Average Daily Traffic	(Adt):	800 vehicle	es				A	utos:	15		
Peak Hour Percer		10%			Med	dium Truc	ks (2 A)	des):	15		
Peak Hour Vo	lume:	80 vehicle	s		Hea	avy Truck	s (3+ A)	des):	15		
Vehicle S	peed:	25 mph		1	ehicle I						
Near/Far Lane Dist	ance:	12 feet		V		cleType	1	Dav	Evening	Niaht	Daily
Site Data					veni			2.9%	7.1%	10.0%	
	- laste to	0.0 feet			Me	dium Tru		2.8%		11.7%	
Barrier He Barrier Type (0-Wall, 1-E	•	0.0			E	leavy Tru	cks: 6	9.3%	8.7%	22.0%	3.149
Centerline Dist. to B		30.0 feet									
Centerline Dist. to Obs		30.0 feet		N	oise So	urce Elev			eet)		
Barrier Distance to Obs		0.0 feet				Autos:	0.0				
Observer Height (Above	Pad):	5.0 feet				n Trucks:	2.2		Our de Ad		
Pad Elev	ation:	0.0 feet			Heav	y Trucks:	8.0	04	Grade Adj	usumenn	. 0.0
Road Elev	ation:	0.0 feet		L	ane Equ	ıivalent D	Distance	e (in i	feet)		
Road G	Grade:	0.0%				Autos:	29.8	16			
Left	View:	-90.0 degre	es		Mediur	n Trucks:	29.5	18			
Right	View:	90.0 degre	es		Heav	y Trucks:	29.5	47			
FHWA Noise Model Calc	ulations	5									
	MEL	Traffic Flow	Dista		Finite		Fresne		Barrier Atte		rm Atten
Autos:	58.73	-10.69		3.26		-1.20		4.49	0.0		0.00
Medium Trucks:	70.80	-22.18		3.33		-1.20		4.86	0.0		0.00
Heavy Trucks:	77.97	-25.29		3.32		-1.20	-	5.77	0.0	00	0.00
Unmitigated Noise Level										-	
	eak Hou	1 1		Leq Eve	· ·	Leq Ni	v		Ldn		NEL
Autos:	50. 50.		48.5 49.1		43.9 43.4		40.6 41.9		49.1 50.1		49. 50.
Medium Trucks: Heavy Trucks:	50. 54.	-	49.1 52.4		43.4		41.9		50.1		50.
Vehicle Noise:	57.	*	55.2		49.4 51.3		40.7		57.5		57.
Centerline Distance to N		-			2110		20.0		07.0		07.
Centernine Distance to N	0138 00	inour (III leet	,	70 dł	BA	65 dE	BA	6	0 dBA	55	dBA
			느					-			
			Ldn:	4		9			20		44

	FHWA	-RD-77-108 H	IGHWA	NY NC	DISE PR	EDICT	ION MO	DEL						
Scenario: EAC 20 Road Name: Watern Road Segment: s/o Ora	nan Av				1		Name: lumber:		ay South					
SITE SPECIFIC		JT DATA				P	IOISE I	NODE		s				
Highway Data				Site Conditions (Hard = 10, Soft = 15)										
Average Daily Traffic (Ad	t): 30	,800 vehicles						Autos:	15					
Peak Hour Percentag		10%			Med	lium Tr	ucks (2)	Axles):	15					
Peak Hour Volum	ie: 3,	080 vehicles			Hea	vy Tru	cks (3+)	Axles):	15					
Vehicle Spee	d:	50 mph		14	ehicle M	liv								
Near/Far Lane Distand	e:	60 feet				leType		Dav	Evening	Night	Daily			
Site Data					Venie		, Autos:	82.9%	•	10.0%				
		0.0 (aat		-	Mee		rucks:	82.8%		11.7%				
Barrier Heigl Barrier Type (0-Wall, 1-Bern		0.0 feet 0.0						69.3%		22.0%				
Centerline Dist. to Barrie	·	0.0 50.0 feet												
Centerline Dist. to Observe		50.0 feet		No	oise Sou		levation		eet)					
Barrier Distance to Observe		0.0 feet				Auto		000						
Observer Height (Above Pa		5.0 feet			Medium			297						
Pad Elevatio	·	0.0 feet			Heavy	Truck	s: 8.	004	Grade Ad	justment	: 0.0			
Road Elevatio		0.0 feet		Lá	ane Equ	ivalen	t Distan	ce (in	feet)					
Road Grad		0.0%				Auto	s: 40.	311	,					
Left Vie		90.0 degrees			Medium	Truck	s: 40.	091						
Right Vie	w:	90.0 degrees			Heavy	Truck	s: 40.	113						
FHWA Noise Model Calcula	tions													
VehicleType REMEL	. T	raffic Flow	Distan	ce	Finite F	Road	Fresr	nel	Barrier Att	en Ber	m Atter			
	0.20	2.15		1.30		-1.20		-4.65		000	0.00			
	.00	-9.34		1.34		-1.20		-4.87		000	0.00			
	5.38	-12.45		1.33		-1.20		-5.43	0.0	000	0.00			
Unmitigated Noise Levels (
VehicleType Leq Peak		Leq Day		q Eve		Leq	Night		Ldn		NEL			
Autos:	72.5	70			66.2		62.9		71.4		71			
Medium Trucks:	71.8		.2		64.5		62.9	-	71.1		71			
Heavy Trucks:	73.1		.7		67.7		66.9	-	74.0		74			
Vehicle Noise:	77.2		i.4		71.1		69.5	ō	77.3	2	77			
Centerline Distance to Nois	e Cont	our (in feet)		70 dE	24	65	dBA	4	60 dBA	FF	dBA			
		10	in:	150 aE			ава 23		696		ава 500			
				100		3	20		030	Ι,	300			

	FH\	WA-RD-77-108	HIGH	IWAY N	OISE PR	EDICTI	ON MO	ODEL						
	b: EAC 2018 e: Waterman t: s/o Dumas				Project Name: Gateway South Job Number: 10189									
	SPECIFIC IN	IPUT DATA							L INPUT	s				
Highway Data				5	Site Con	ditions	(Hard :	= 10, So	oft = 15)					
Average Daily 1	Fraffic (Adt):	28,500 vehicl	es					Autos:	15					
Peak Hour I	Percentage:	10%			Med	dium Tru	ıcks (2	Axles):	15					
Peak He	our Volume:	2,850 vehicle	s		Hea	avy Truc	:ks (3+	Axles):	15					
Vel	nicle Speed:	50 mph		1	/ehicle I	<i>lix</i>								
Near/Far Lar	e Distance:	60 feet		F	Vehi	cleType		Day	Evening	Night	Daily			
Site Data						A	Autos:	82.9%	7.1%	10.0%	90.45%			
Bar	rier Heiaht:	0.0 feet			Me	dium Ti	ucks:	82.8%	5.6%	11.7%	6.429			
Barrier Type (0-Wa		0.0			H	leavy Tr	ucks:	69.3%	8.7%	22.0%	3.149			
Centerline Dis	t. to Barrier:	50.0 feet		7	Voise So	urce El	evatio	ns (in f	eet)					
Centerline Dist. t	o Observer:	50.0 feet		-		Autos		.000	,					
Barrier Distance t	o Observer:	0.0 feet			Modiur	n Truck		297						
Observer Height (/	Above Pad):	5.0 feet				v Trucks		.004	Grade Ad	iustment	: 0.0			
Pa	d Elevation:	0.0 feet												
Roa	d Elevation:	0.0 feet		1	.ane Equ				feet)					
F	Road Grade:	0.0%				Autos).311						
	Left View:	-90.0 degre	es			n Trucks		0.091						
	Right View:	90.0 degre	es		Heav	y Trucks	s: 40).113						
FHWA Noise Mode	Calculation	s												
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite	Road	Fres	anel	Barrier Att	en Ber	m Atten			
Autos:	70.20			1.30		-1.20		-4.65		000	0.00			
Medium Trucks:	81.00			1.34		-1.20		-4.87		000	0.00			
Heavy Trucks:	85.38	-12.78		1.33	3	-1.20		-5.43	0.0	000	0.00			
Unmitigated Noise														
	Leq Peak Ho			Leq Ev	~	Leq	Night		Ldn		NEL			
Autos:	72		70.5		65.9		62		71.1		71.			
Medium Trucks:	71		69.9		64.1		62		70.8	-	71.			
Heavy Trucks:	72		70.3		67.3		66		73.7		73.			
Vehicle Noise:	76	5.9	75.0		70.8		69	.1	76.8	3	77.			
Centerline Distanc	e to Noise C	ontour (in feet)											
			L	70 c			dBA	6	60 dBA		dBA			
			Ldn:	14	-		07		661 690		425 487			
			NFI :	14		32								

	FH	WA-RD-77-108	B HIGH	NAY NC	ISE P	REDICT		DEL			
	2: EAC 2018 2: Waterman 2: s/o Park C						t Name: (lumber: ·		ay South		
	PECIFIC I	NPUT DATA							L INPUT	s	
Highway Data				Si	te Cor	nditions	(Hard =	10, So	oft = 15)		
Average Daily 1	raffic (Adt):	34,900 vehic	es					Autos:	15		
Peak Hour I	Percentage:	10%					ucks (2 A	/	15		
Peak Ho	our Volume:	3,490 vehicle	s		He	eavy Tru	cks (3+ A	(xles):	15		
	icle Speed:	50 mph		Ve	hicle	Mix					
Near/Far Lan	e Distance:	60 feet			Veh	icleType	э	Day	Evening	Night	Daily
Site Data								, 82.9%	7.1%	10.0%	90.45%
Bar	rier Heiaht:	0.0 feet			Μ	ledium T	rucks:	82.8%	5.6%	11.7%	6.42%
Barrier Type (0-Wa		0.0				Heavy T	rucks:	69.3%	8.7%	22.0%	3.14%
Centerline Dis		50.0 feet		N	oise S	ource E	levation	s (in fe	et)		
Centerline Dist. t		50.0 feet				Auto	s: 0.0	000	,		
Barrier Distance t		0.0 feet			Mediu	m Truck		297			
Observer Height (A	,	5.0 feet			Hear	vy Truck	s: 8.0	004	Grade Ad	iustment	: 0.0
	d Elevation:	0.0 feet					1 Distant		(
	d Elevation:	0.0 feet		Lē	ine Eq	Auto	t Distand		reet)		
	load Grade:	0.0%			Madiu	Auto m Truck					
	Left View: Right View:	-90.0 degre 90.0 degre				vy Truck					
	•	0	03			,	10.				
FHWA Noise Mode		-	0.1		E	<u> </u>	_				
VehicleType Autos:	REMEL 70.20	Traffic Flow		ance 1.30	Finite	Road -1.20	Fresn	-4.65	Barrier Atte 0.0		m Atten 0.000
Medium Trucks:	81.00			1.30		-1.20		-4.87		00	0.000
Heavy Trucks:	85.38			1.34		-1.20		-4.07 -5.43	0.0		0.000
Unmitigated Noise					otion)	1.20		0.40	0.0	.00	0.000
	Levers (with Leg Peak Ho			Leg Eve		100	Night		Ldn	0	NEL
Autos:	1	3.0	71.4	209 210	66.8		63.4		72.0		72.3
Medium Trucks:		2.3	70.7		65.0		63.5		71.7		71.9
Heavy Trucks:	73	3.6	71.2		68.2		67.5		74.5	5	74.8
Vehicle Noise:	77	7.8	75.9		71.6		70.0		77.7	,	78.0
Centerline Distanc	e to Noise C	ontour (in fee	t)								
				70 dE			dBA	6	i0 dBA		dBA
			Ldn:	163			51		757		631
		С	NEL:	170		3	67		790	1,	703

Monday, April 17, 2017

Monday, April 17, 2017

	FHW	A-RD-77-108 I	HIGHW.	AY N	OISE PR	EDICTIO	N MOD	EL			
Scenario	: EAC 2018			Project Name: Gateway South							
	e: Waterman A					Job Nur	nber: 10	189			
Road Segmen	t: n/o Hospitali	ity Ln.									
	PECIFIC IN	PUT DATA						DDEL I			
Highway Data				S	lite Con	ditions (H	lard = 1	0, Soft =	: 15)		
Average Daily T	raffic (Adt):	29,900 vehicles	6				AL	<i>itos:</i> 1	5		
Peak Hour F	Percentage:	10%			Med	dium Truc	ks (2 Ax	<i>les):</i> 1	5		
Peak Ho	our Volume:	2,990 vehicles			Hea	avy Truck	s (3+ Ax	<i>les):</i> 1	5		
Veh	icle Speed:	50 mph		L.	ehicle l	<i>Aix</i>					
Near/Far Lan	e Distance:	60 feet		F		cleType	D	av Ev	ening N	light	Daily
Site Data								2.9%		•	90.45%
Bari	ier Heiaht:	0.0 feet			Me	dium Tru	cks: 8	2.8%	5.6% 1	1.7%	6.42%
Barrier Type (0-Wa		0.0			H	leavy Tru	cks: 69	9.3%	8.7% 2	2.0%	3.14%
Centerline Dis	t. to Barrier:	50.0 feet			loise So	urce Elev	vations	(in feet)			
Centerline Dist. te	o Observer:	50.0 feet		-		Autos:	0.00	. /			
Barrier Distance te	o Observer:	0.0 feet			Modiur	n Trucks:	2.29	-			
Observer Height (A	bove Pad):	5.0 feet				v Trucks:			de Adjus	tment [.]	0.0
Pa	d Elevation:	0.0 feet				·					
Roa	d Elevation:	0.0 feet		L	ane Equ	ıivalent E	Distance	(in feet)		
R	oad Grade:	0.0%				Autos:	40.31				
	Left View:	-90.0 degrees	5		Mediur	n Trucks:	40.09	11			
	Right View:	90.0 degree	5		Heav	y Trucks:	40.11	3			
FHWA Noise Mode	I Calculations										
VehicleType	REMEL	Traffic Flow	Distar	ice	Finite		Fresne	Bar	rier Atten	Bern	n Atten
Autos:	70.20	2.03		1.30		-1.20	-4	.65	0.000		0.00
Medium Trucks:	81.00	-9.46		1.34		-1.20		1.87	0.000		0.000
Heavy Trucks:	85.38	-12.58		1.33		-1.20	-5	5.43	0.000		0.000
Unmitigated Noise			arrier a	attenu	uation)						
,1	Leq Peak Hour			eq Ev	ening	Leq Ni		Ldi		CN	
Autos:	72.		0.7		66.1		62.8		71.3		71.6
Medium Trucks:	71.		0.1		64.4		62.8		71.0		71.3
Heavy Trucks:	72.	÷ .	0.6		67.6		66.8		73.9		74.
Vehicle Noise:	77.		5.2		71.0		69.3		77.0		77.3
Centerline Distance	e to Noise Co	ntour (in feet)		70	-	05.10			-		-
				70 d		65 dE		60 di		55 0	
			dn:	14		317		683	-	1,4	
		CN	EL:	15	4	331		713	5	1,5	30

	FHV	VA-RD-77-108	HIGH	IWAY NC	ISE PREDICT		DEL							
	o: EAC 2018 e: Waterman	Av				t Name: lumber:		ay South						
Road Segmen					0001	umbor.	10100							
SITE S	SPECIFIC IN	IPUT DATA						L INPUTS	5					
Highway Data				Si	Site Conditions (Hard = 10, Soft = 15)									
Average Daily	Traffic (Adt):	45,600 vehicle	es				Autos:	15						
Peak Hour I	Percentage:	10%			Medium Tr	ucks (2	Axles):	15						
Peak He	our Volume:	4,560 vehicles	5		Heavy Tru	icks (3+)	Axles):	15						
Vel	nicle Speed:	50 mph		14	hicle Mix									
Near/Far Lar	ne Distance:	60 feet		Ve	VehicleTyp	•	Dav	Evening	Night	Daily				
Site Data						Autos:	82.9%	7.1%	10.0%					
					Medium 1		82.8%		11.7%	6.429				
	rier Height:	0.0 feet			Heavy 7		69.3%		22.0%	3.149				
Barrier Type (0-Wa	. ,	0.0			,				22.070	0.147				
Centerline Dis Centerline Dist. t		50.0 feet		N	oise Source E	levation	ıs (in fe	et)						
Barrier Distance t		50.0 feet 0.0 feet			Auto	os: 0.	000							
		5.0 feet			Medium Truck	(s: 2.	297							
Observer Height (/	d Elevation:	0.0 feet			Heavy Truck	(s: 8.	004	Grade Adj	ustment:	0.0				
	d Elevation: d Elevation:	0.0 feet		1:	ane Equivalen	t Distan	ce (in f	oot)						
	o Elevation. Road Grade:	0.0%			Auto		311	000						
r	Left View:	-90.0 degree			Medium Truck		091							
	Right View:	90.0 degree			Heavy Truck		113							
	ragin view.	30.0 degree	.5		noary muo	.0. 10.								
FHWA Noise Mode		-												
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite Road	Fresi		Barrier Atte		m Atten				
Autos:	70.20	3.86		1.30	-1.20		-4.65	0.0		0.00				
Medium Trucks:	81.00	-7.63		1.34	-1.20		-4.87	0.0		0.00				
Heavy Trucks:	85.38	-10.74		1.33	-1.20		-5.43	0.0	00	0.00				
Unmitigated Noise	Levels (with	out Topo and	barrie	er attenu	ation)									
,,	Leq Peak Hou			Leq Eve		Night		Ldn	CI	IEL				
Autos:	74		72.6		67.9	64.0		73.1		73.				
Medium Trucks:	73		71.9		66.2	64.0	-	72.8		73.				
Heavy Trucks:	74		72.4		69.4	68.0	-	75.7		76.				
Vehicle Noise:	78	.9	77.1		72.8	71.:	2	78.9		79.				
Centerline Distanc	e to Noise Co	ontour (in feet))							-				
			L	70 dE		dBA		0 dBA		dBA				
			Ldn:	195	4	20		905	1,9	949				
			VFL:	203		38		944)35				

					IOISE PI						
	o: EAC 2018								ay South		
	e: Auto Cente					Job N	umber:	10189			
Road Segmer	nt: e/01-215 F	wy.									
SITE	SPECIFIC IN	NPUT DATA							L INPUT	S	
Highway Data				4	Site Cor	ditions	(Hard :	= 10, So	oft = 15)		
Average Daily	Traffic (Adt):	45,400 vehic	es					Autos:	15		
Peak Hour	Percentage:	10%				dium Tr			15		
Peak H	our Volume:	4,540 vehicle	s		He	avy Tru	cks (3+	Axles):	15		
Ve	hicle Speed:	40 mph			Vehicle	Mix					
Near/Far La	ne Distance:	60 feet		F		icleType		Dav	Evening	Night	Daily
Site Data				-			Autos:	82.9%	7.1%	10.0%	90.45%
Bai	rier Height:	0.0 feet			М	edium T	rucks:	82.8%	5.6%	11.7%	6.42%
Barrier Type (0-W		0.0			I	Heavy T	rucks:	69.3%	8.7%	22.0%	3.14%
Centerline Dis		50.0 feet			Noise Se	ource E	levatio	ns (in fe	et)		
Centerline Dist.	to Observer:	50.0 feet		F		Auto		.000	,		
Barrier Distance	to Observer:	0.0 feet			Mediu	m Truck		297			
Observer Height (,	5.0 feet			Heav	v Truck	s: 8	004	Grade Ad	ustment	: 0.0
	ad Elevation:	0.0 feet									
	ad Elevation:	0.0 feet		4	Lane Eq				teet)		
1	Road Grade:	0.0%				Auto		.311			
	Left View:	-90.0 degre				m Truck		.091			
	Right View:	90.0 degre	es		Heav	/y Truck	s: 40	.113			
FHWA Noise Mode	el Calculation	IS									
VehicleType	REMEL	Traffic Flow		stance		Road	Fres		Barrier Atte		m Atten
Autos:	66.51	4.81		1.30	-	-1.20		-4.65	0.0		0.00
Medium Trucks:	77.72			1.34		-1.20		-4.87	0.0		0.00
Heavy Trucks:	82.99	-9.79		1.33	3	-1.20		-5.43	0.0	00	0.00
Unmitigated Noise	1				,						
VehicleType	Leq Peak Ho	1 1		Leq E	~		Night		Ldn		NEL
Autos:		.4	69.8		65.2		61	-	70.4		70.
Medium Trucks:		.2	69.6		63.9		62	-	70.5		70.
Heavy Trucks:		3.3	71.0		67.9		67	-	74.3		74.
Vehicle Noise:	76	3.9	74.9		70.8		69	.3	76.9)	77.:
Centerline Distand	e to Noise C	ontour (in fee	t)					_			
				70 0			dBA	6	60 dBA		dBA
			Ldn: NFL:	14 15		-	10 24		668 698		440 503

	FHW	A-RD-77-108 H	IIGHW.	AY NO	DISE PI	REDICTIO	N MO	DEL					
Road Nan	Scenario: EAC 2018 Road Name: Orange Show Rd. Road Segment: e/o E St.					Project N Job Nur							
SITE	SPECIFIC INF	PUT DATA		NOISE MODEL INPUTS									
Highway Data				S	ite Cor	nditions (H	lard =	10, S	oft = 15)				
Average Daily	Traffic (Adt): 3	37,300 vehicles					,	Autos:	15				
Peak Hour	Percentage:	10%			Me	dium Truc	ks (2 A	xles):	15				
Peak H	Hour Volume:	3,730 vehicles			He	avy Truck	s (3+ A	xles):	15				
Ve	ehicle Speed:	50 mph		V	ehicle	Miv							
Near/Far La	ane Distance:	60 feet				icleType	1	Day	Evening	Night	Daily		
Site Data					Ven			82.9%	•	10.0%			
					М	edium Tru		82.8%		11.7%			
	rrier Height:	0.0 feet 0.0				Heavy Tru		69.3%		22.0%			
Barrier Type (0-V	ist, to Barrier:	50.0 feet											
Centerline Dist.		50.0 feet		N	oise S	ource Elev		s (in f	eet)				
Barrier Distance		0.0 feet				Autos:	0.0	000					
Observer Height		5.0 feet				m Trucks:		297					
	ad Flevation:	0.0 feet			Heav	/y Trucks:	8.0	004	Grade Adj	iustment	: 0.0		
	ad Elevation: ad Elevation:	0.0 feet		L	ane Eo	uivalent L	Distand	e (in	feet)				
	Road Grade:	0.0%				Autos:	40.3						
	Left View:	-90.0 degrees			Mediu	m Trucks:	40.0						
	Right View:	90.0 degrees			Heav	/y Trucks:	40.	113					
FHWA Noise Mod	lel Calculations			_									
VehicleType	REMEL	Traffic Flow	Distar	ice	Finite	Road	Fresn	el	Barrier Att	en Bei	rm Atten		
Autos:	70.20	2.99		1.30		-1.20		-4.65	0.0	000	0.000		
Medium Trucks:	81.00	-8.50		1.34		-1.20		-4.87	0.0	000	0.000		
Heavy Trucks:	85.38	-11.62		1.33		-1.20		-5.43	0.0	000	0.000		
Unmitigated Nois	e Levels (witho	ut Topo and b	arrier a	attenu	ation)								
VehicleType	Leq Peak Hour	Leq Day	Le	eq Eve	ening	Leq N	ight		Ldn	С	NEL		
Autos:		3 7	1.7		67.0		63.7		72.3	5	72.6		
Medium Trucks:			1.0		65.3		63.8		71.9		72.2		
Heavy Trucks:		-	1.5		68.5		67.8		74.8		75.1		
Vehicle Noise:	78.1	1 7	5.2		71.9		70.3		78.0)	78.3		
Centerline Distan	ce to Noise Co	ntour (in feet)	-						1				
				70 dBA 65 dBA 60 dBA				dBA					
			dn:	170 367 791 1,70									
		CNI	=L:	178	3	383	3		826	1,	780		

Monday, April 17, 2017

Monday, April 17, 2017

	FH\	NA-RD-77-108	HIGHWA	VY NO	DISE PR	EDICTIO	N MOI	DEL			
	o: EAC 2018 e: Orange Sh t: e/o Arrowh					Project Na Job Nun			ay South		
SITE S	SPECIFIC IN	IPUT DATA		Т		NO	ISE N	IODE	L INPUT	s	
Highway Data				S	ite Con	ditions (H	ard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt):	29,100 vehicle	s				1	Autos:	15		
Peak Hour I	Percentage:	10%			Med	dium Truck	ks (2 A	xles):	15		
Peak Ho	our Volume:	2,910 vehicles			Hea	avy Trucks	s (3+ A	xles):	15		
Vel	nicle Speed:	50 mph		V	ehicle N	liv					
Near/Far Lar	e Distance:	60 feet				cleType		Dav	Evening	Night	Dailv
Site Data					10/11	Aut		82.9%	•	10.0%	
Bar	rier Height:	0.0 feet			Me	dium Truc	ks:	82.8%	5.6%	11.7%	6.429
Barrier Type (0-Wa	•	0.0			H	leavy Truc	:ks:	69.3%	8.7%	22.0%	3.149
Centerline Dis	t. to Barrier:	50.0 feet		N	oise So	urce Elev	ations	s (in fe	et)		
Centerline Dist. t	o Observer:	50.0 feet				Autos:	0.0		,		
Barrier Distance t	o Observer:	0.0 feet			Mediun	n Trucks:	2.2	97			
Observer Height (/	,	5.0 feet			Heav	v Trucks:	8.0	04	Grade Ad	justment	: 0.0
	d Elevation:	0.0 feet		-		·					
	d Elevation:	0.0 feet		L	ane Equ	ivalent D			'eet)		
F	Road Grade:	0.0%				Autos:	40.3				
	Left View: Right View:	-90.0 degree 90.0 degree				n Trucks: y Trucks:	40.0 40.1				
FHWA Noise Mode	l Calculation	s									
VehicleType	REMEL	Traffic Flow	Distan	ce	Finite	Road	Fresn	el	Barrier Att	en Bei	rm Atten
Autos:	70.20	1.91		1.30		-1.20		4.65	0.0	000	0.00
Medium Trucks:	81.00	-9.58		1.34		-1.20		4.87	0.0	000	0.00
Heavy Trucks:	85.38	-12.69		1.33		-1.20		-5.43	0.0	000	0.00
Unmitigated Noise	Levels (with	out Topo and I	oarrier a	ttenu	ation)						
	Leq Peak Hou	1 1		q Eve	ening	Leq Nig	,		Ldn		NEL
Autos:	72		0.6		66.0		62.7		71.2		71.
Medium Trucks:	71		9.9		64.2		62.7		70.9	-	71.
Heavy Trucks:	72		0.4		67.4		66.7		73.8	-	74.
Vehicle Noise:	77		5.1		70.8		69.2		76.9	9	77.
Centerline Distanc	e to Noise Co	ontour (in feet)		70 dł	RA	65 dB	24	F	0 dBA	55	dBA
		,	dn:	144		311	••		671		445
			IFI :	151		325			700		508
		ON ON				525					

	FHW/	A-RD-77-108	HIGI	HWAY N	NOISE PF	REDICT	ION MO	DEL			
Scenario: EAC 2 Road Name: Orange Road Segment: e/o Wa	e Shov						t Name: lumber:		ay South		
SITE SPECIFI	C INP	UT DATA				1	NOISE	NODE	L INPUT	s	
Highway Data					Site Con	ditions	; (Hard =	10, Se	oft = 15)		
Average Daily Traffic (Ad	lt): 2	8,700 vehicle	es					Autos:	15		
Peak Hour Percentag	je:	10%			Mee	dium Ti	rucks (2 /	Axles):	15		
Peak Hour Volum	ne: 2	,870 vehicle	5		Hea	avy Tru	icks (3+ /	Axles):	15		
Vehicle Spee	ed:	50 mph		-	Vehicle I	Mix					
Near/Far Lane Distand	e:	60 feet				icleTyp	e	Day	Evening	Night	Daily
Site Data							Autos:	82.9%			
Barrier Heigi	ht.	0.0 feet			Me	edium T	rucks:	82.8%	5.6%	11.7%	6.42
Barrier Type (0-Wall, 1-Berr		0.0			F	leavy T	rucks:	69.3%	8.7%	22.0%	3.149
Centerline Dist. to Barri	·	50.0 feet		-	N-/ 0-			- // 6			
Centerline Dist. to Observ	er:	50.0 feet		-	Noise So	Auto			eet)		
Barrier Distance to Observ	er:	0.0 feet			Mediur			000 297			
Observer Height (Above Pa	d):	5.0 feet				y Truci		297 004	Grade Ad	diustmon	H 0.0
Pad Elevation	on:	0.0 feet			neav	y muci	18. 0.	004	Grade Ad	ijusimeni	. 0.0
Road Elevation	on:	0.0 feet			Lane Equ	uivaler	t Distan	ce (in	feet)		
Road Grad	le:	0.0%				Auto	os: 40.	311			
Left Vie	W.	-90.0 degree	es		Mediur	n Trucl	ks: 40.	091			
Right Vie	W:	90.0 degree	es		Heav	y Trucl	(s: 40.	113			
FHWA Noise Model Calcula											
VehicleType REMEL		Traffic Flow	Di	stance	Finite		Fresi		Barrier At		rm Atter
	0.20	1.85		1.3	-	-1.20		-4.65		000	0.00
	1.00	-9.64		1.3		-1.20		-4.87		000	0.00
	5.38	-12.75		1.3	-	-1.20		-5.43	0.	000	0.00
Unmitigated Noise Levels (-		é ,			1		-	
VehicleType Leq Peak		Leq Day		Leq E	vening	Leq	Night		Ldn		NEL
Autos:	72.2		70.5 69.9		65.9 64.2		62.6 62.6		71.		71.
Medium Trucks: Heavy Trucks:	71.5 72.8		69.9 70.4		67.4		66.6	-	70. 73.		71.
Vehicle Noise:	72.8		70.4		70.8		69.2		73.		74
					70.0		09.4	<u>.</u>	76.	.9	
Centerline Distance to Nois	e Con	tour (in feet	,	70	dBA	65	dBA	(60 dBA	55	dBA
			Ldn:		43		308		664		431
			VFI :		49		322		694		494

	FR	WA-RD-77-10	8 HIGI	TWATE	IOISE PI	REDICTI		DEL			
	: EAC 2018								ay South		
	e: Orange Sh					Job Ni	umber:	10189			
Road Segmen	t: e/o Waterr	nan Av.									
	PECIFIC IN	NPUT DATA								S	
Highway Data					Site Con	ditions	Hard =	= 10, Sc	oft = 15)		
Average Daily	raffic (Adt):	26,900 vehic	cles					Autos:	15		
Peak Hour I	Percentage:	10%				dium Tru	,		15		
Peak Ho	our Volume:	2,690 vehicl	es		He	avy Truc	ks (3+	Axles):	15		
Vel	icle Speed:	50 mph		-	Vehicle	Mix					
Near/Far Lar	e Distance:	60 feet		F	Veh	icleType		Day	Evening	Night	Daily
Site Data						A	utos:	82.9%	7.1%	10.0%	90.45%
Ban	rier Height:	0.0 feet			M	edium Tr	ucks:	82.8%	5.6%	11.7%	6.42%
Barrier Type (0-Wa	•	0.0			ŀ	Heavy Tr	ucks:	69.3%	8.7%	22.0%	3.14%
Centerline Dis	t. to Barrier:	50.0 feet			Noise Sc	ource Ele	evatio	ns (in fe	et)		
Centerline Dist. t	o Observer:	50.0 feet		-		Autos		.000			
Barrier Distance t	o Observer:	0.0 feet			Modiu	m Trucks		.000			
Observer Height (/	Above Pad):	5.0 feet				v Trucks		.004	Grade Ad	ustment	0.0
Pa	d Elevation:	0.0 feet			Ticav	y mucka	. 0	.004	0/440 / 14	dourioni	0.0
Roa	d Elevation:	0.0 feet		1	Lane Eq	uivalent	Distar	ice (in i	eet)		
F	load Grade:	0.0%				Autos	: 40	.311			
	Left View:	-90.0 degr	ees		Mediu	m Trucks	: 40	.091			
	Right View:	90.0 degr	ees		Heav	ry Trucks	: 40	.113			
FHWA Noise Mode	I Calculation	ıs									
VehicleType	REMEL	Traffic Flow	Di	stance	Finite	Road	Fres	nel	Barrier Att	en Ber	m Atten
Autos:	70.20	1.5	7	1.3	0	-1.20		-4.65	0.0	00	0.00
Medium Trucks:	81.00	-9.92	2	1.3	4	-1.20		-4.87	0.0	00	0.00
Heavy Trucks:	85.38	-13.04	4	1.3	3	-1.20		-5.43	0.0	00	0.00
Unmitigated Noise	Levels (with	nout Topo and	d barri	er atten	uation)						
,,	Leq Peak Ho		/	Leq E	vening	Leq I			Ldn		NEL
Autos:		1.9	70.3		65.6		62.	-	70.9		71.
Medium Trucks:		1.2	69.6		63.9		62.	-	70.5		70.
Heavy Trucks:		2.5	70.1		67.1		66.		73.4		73.
Vehicle Noise:	76	6.7	74.8		70.5		68.	9	76.6	5	76.
Centerline Distanc	e to Noise C	ontour (in fee	et)								
				70 (dBA	65 0	1BA	6	0 dBA	55	dBA
			Ldn:	13 14	37	29			636 664		371 431

	FHW	A-RD-77-108 HIG	HWAY	NOISE PI	REDICTI	ON MOI	DEL			
Road Nam	io: EAPC 2018 le: Washington nt: s/o Orange \$					Name: (umber: 1		ay South		
	SPECIFIC INF	PUT DATA						L INPUTS	S	
Highway Data				Site Con	ditions	(Hard =	10, S	oft = 15)		
Average Daily	Traffic (Adt):	1,073 vehicles					Autos:	15		
Peak Hour	Percentage:	10%		Me	dium Tru	icks (2 A	xles):	15		
Peak H	lour Volume:	107 vehicles		He	avy Truc	:ks (3+ A	xles):	15		
Ve	hicle Speed:	25 mph	-	Vehicle	Mix					
Near/Far La	ne Distance:	12 feet	-		icleType		Day	Evening	Night	Daily
Site Data				1011			82.9%	•	· ·	67.43%
Pa	rrier Heiaht:	0.0 feet		M	edium Tr	ucks:	82.8%	5.6%	11.7%	10.38%
Barrier Type (0-W		0.0		1	Heavy Tr	ucks:	69.3%	8.7%	22.0%	22.19%
Centerline Di	. ,	30.0 feet	-							
Centerline Dist.		30.0 feet	-	Noise So				eet)		
Barrier Distance	to Observer:	0.0 feet			Autos					
Observer Height (Above Pad):	5.0 feet			m Trucks			Grade Adj		
Pa	ad Elevation:	0.0 feet		Heav	y Trucks	s: 8.0	104	Grade Auj	usunen	. 0.0
Roa	ad Elevation:	0.0 feet	ľ	Lane Eq	uivalent	Distand	e (in	feet)		
	Road Grade:	0.0%	ſ		Autos	s: 29.8	316			
	Left View:	-90.0 degrees		Mediu	m Trucks	s: 29.5	518			
	Right View:	90.0 degrees		Heav	ry Trucks	3: 29.5	547			
FHWA Noise Mod	el Calculations									
VehicleType	REMEL	Traffic Flow D	istance	Finite	Road	Fresn	el	Barrier Atte	en Bei	rm Atten
Autos:	58.73	-10.69	3.2	26	-1.20		-4.49	0.0	00	0.000
Medium Trucks:	70.80	-18.82	3.3	33	-1.20		-4.86	0.0	00	0.000
Heavy Trucks:	77.97	-15.52	3.3	32	-1.20		-5.77	0.0	00	0.000
Unmitigated Noise	e Levels (witho	ut Topo and bar	rier attei	nuation)						
VehicleType	Leq Peak Hour	Leq Day	Leq E	vening	Leq	Night		Ldn	С	NEL
Autos:	50.1			43.9		40.6		49.1		49.4
Medium Trucks:	54.1			46.8		45.2		53.4		53.7
Heavy Trucks:	64.6	62.2		59.2		58.5		65.5		65.8
Vehicle Noise:	65.1	62.8		59.6		58.7		65.9	1	66.1
Centerline Distant	ce to Noise Cor	ntour (in feet)				-				
				dBA		dBA		60 dBA		dBA
		Ldn.		16	-	4		74		159
		CNEL	: 1	17	3	6		77	1	166

Monday, April 17, 2017

Monday, April 17, 2017

Scenario: EAPC 2018									
Road Name: Waterman Av. Road Segment: s/o Orange Show Rd.						: Gatew : 10189	vay South		
SITE SPECIFIC INPUT DATA		1				MODE	L INPUT	· c	
Highway Data		Si	te Cond				oft = 15	5	
Average Daily Traffic (Adt): 31,610 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 3,161 vehicles					,	Autos Axles) Axles)	15		
Vehicle Speed: 50 mph		Ve	hicle N	Niv					
Near/Far Lane Distance: 60 feet		-		cleType		Dav	Evening	Night	Daily
Site Data			Verne		Autos:	82.9%	0	10.0%	
Barrier Height: 0.0 feet			Me	dium Ti	rucks:	82.89	6 5.6%	11.7%	
Barrier Type (0-Wall, 1-Berm): 0.0			н	leavy Ti	rucks:	69.3%	6 8.7%	22.0%	
Centerline Dist. to Barrier: 50.0 feet		No	oise So	urce El	levatio	ns (in f	eet)		
Centerline Dist. to Observer: 50.0 feet				Auto		0.000			
Barrier Distance to Observer: 0.0 feet			Mediun	n Truck	s: :	2.297			
Observer Height (Above Pad): 5.0 feet			Heav	V Truck	s: I	3.004	Grade Ad	liustmen	t: 0.0
Pad Elevation: 0.0 feet									
Road Elevation: 0.0 feet		La	ne Equ			nce (in	feet)		
Road Grade: 0.0%				Auto		0.311			
Left View: -90.0 degrees Right View: 90.0 degrees			Mediun Heavy	n Truck v Truck		0.091 0.113			
FHWA Noise Model Calculations									
VehicleType REMEL Traffic Flow	Distance	e	Finite I	Road	Fre	snel	Barrier Att	ten Be	rm Atten
Autos: 70.20 2.27	1	.30		-1.20		-4.65	0.0	000	0.00
Medium Trucks: 81.00 -9.32	1	.34		-1.20		-4.87	0.0	000	0.00
Heavy Trucks: 85.38 -12.33	1	.33		-1.20		-5.43	0.0	000	0.00
Unmitigated Noise Levels (without Topo and ba	arrier att	enua	ation)						
VehicleType Leq Peak Hour Leq Day	Leq	Eve	ning	Leq	Night		Ldn	-	NEL
	.0		66.3		63		71.0		71.
).2		64.5		62		71.		71.
).8		67.8		67		74.		74.
Vehicle Noise: 77.3 75	5.4		71.2		69	.6	77.3	3	77.
Centerline Distance to Noise Contour (in feet)	-	0 dB		65	dBA		60 dBA		5 dBA
	in:	0 aB	м		ава 28	_	50 dBA 707		,522
CNF		152			28 42		707		,522 .589
CNE		198		3	42		130	1	,009

	FHW.	A-RD-77-108	HIGH	IWAY N	IOISE PR	EDICT	ION MO	DEL			
Scenario: EA	PC 2018					Project	Name:	Gatew	ay South		
Road Name: Wa	aterman A	v.				Job N	lumber:	10189			
Road Segment: s/c	Dumas S	it.									
SITE SPEC	IFIC INF	PUT DATA							L INPUT	s	
Highway Data					Site Cond	ditions	(Hard =	10, So	oft = 15)		
Average Daily Traffic	: (Adt): 2	9,310 vehicle	es					Autos:	15		
Peak Hour Perce	ntage:	10%			Med	lium Tr	ucks (2 /	Axles):	15		
Peak Hour V	olume: 2	931 vehicles	5		Hea	avy Tru	cks (3+ /	(xles)	15		
Vehicle S	Speed:	50 mph			Vehicle N	liv					
Near/Far Lane Dis	tance:	60 feet		F		cleType	9	Day	Evening	Night	Daily
Site Data								82.9%	•	10.0%	
Barrier H	loiaht.	0.0 feet			Me			82.8%		11.7%	6.279
Barrier Type (0-Wall, 1-		0.0			н	leavy T		69.3%		22.0%	
Centerline Dist. to E	,	50.0 feet		_							
Centerline Dist. to Ob		50.0 feet		1	Noise So				eet)		
Barrier Distance to Ob		0.0 feet				Auto		000			
Observer Height (Above		5.0 feet			Mediun			297			
Pad Ele		0.0 feet			Heavy	/ Truck	s: 8.	004	Grade Ad	justment	0.0
Road Fle		0.0 feet			Lane Equ	iivalen	t Distan	ce (in	feet)		
	Grade:	0.0%		-		Auto					
l ef	t View:	-90.0 degree	s		Mediun	n Truck	s: 40.	091			
Righ	t View:	90.0 degree			Heavy	/ Truck	s: 40.	113			
FHWA Noise Model Cal	culations										
VehicleType RE	MEL	Traffic Flow	Dis	stance	Finite I	Road	Fresr	iel	Barrier Att	en Ber	m Atter
Autos:	70.20	1.95		1.3)	-1.20		-4.65	0.0	000	0.00
Medium Trucks:	81.00	-9.65		1.3	1	-1.20		-4.87	0.0	000	0.00
Heavy Trucks:	85.38	-12.65		1.3	3	-1.20		-5.43	0.0	000	0.00
Unmitigated Noise Leve											
,, , ,	Peak Hour			Leq E		Leq	Night		Ldn	-	VEL
Autos:	72.2		70.6		66.0		62.7		71.2		71.
Medium Trucks:	71.5		69.9		64.2		62.6		70.8		71.
Heavy Trucks:	72.9		70.5		67.5		66.7		73.8		74.
Vehicle Noise:	77.0		75.1		70.9		69.2	2	76.9	9	77.
Centerline Distance to I	Noise Cor	ntour (in feet,)	70	0.4	07	-/04		0.104		-10.4
			Ldn:	70 c			dBA 12	6	672		dBA 447
			Lan: VFL:	14			12 26		672 701		
		CI	VEL:	15	1	- 3	20		701	1.	511

FHWA-RD-77-108	HIGHWA	Y NOISE P	REDICTION	MODEL			
Scenario: EAPC 2018 Road Name: Waterman Av. Road Segment: s/o Park Center Dr.			Project Na Job Num	me: Gate ber: 1018			
SITE SPECIFIC INPUT DATA			NOI	SE MOD	EL INPUT	s	
Highway Data		Site Cor	ditions (Ha	ard = 10, S	Soft = 15)		
Average Daily Traffic (Adt): 35,608 vehicle	es			Autos	s: 15		
Peak Hour Percentage: 10%		Me	dium Truck	s (2 Axles): 15		
Peak Hour Volume: 3,561 vehicles	6	He	avy Trucks	(3+ Axles): 15		
Vehicle Speed: 50 mph		Vehicle	Mix				
Near/Far Lane Distance: 60 feet			icleType	Day	Evening	Night	Daily
Site Data			Auto	os: 82.9	% 7.1%	10.0%	89.58%
Barrier Height: 0.0 feet		М	edium Truc	ks: 82.8	% 5.6%	11.7%	6.52%
Barrier Type (0-Wall, 1-Berm): 0.0			Heavy Truc	ks: 69.3	% 8.7%	22.0%	3.909
Centerline Dist. to Barrier: 50.0 feet		Noise S	ource Eleva	ations (in	feet)		
Centerline Dist. to Observer: 50.0 feet			Autos:	0.000			
Barrier Distance to Observer: 0.0 feet		Modiu	m Trucks:	2.297			
Observer Height (Above Pad): 5.0 feet			/v Trucks:	8.004	Grade Ad	liustment	0.0
Pad Elevation: 0.0 feet			,				
Road Elevation: 0.0 feet		Lane Eq	uivalent Di		n feet)		
Road Grade: 0.0%			Autos:	40.311			
Left View: -90.0 degree			m Trucks:	40.091			
Right View: 90.0 degree	es	Hear	y Trucks:	40.113			
FHWA Noise Model Calculations							
VehicleType REMEL Traffic Flow	Distant			Fresnel	Barrier Att		m Atten
Autos: 70.20 2.74		1.30	-1.20	-4.65		000	0.00
Medium Trucks: 81.00 -8.63		1.34	-1.20	-4.87		000	0.00
Heavy Trucks: 85.38 -10.87		1.33	-1.20	-5.43	8 0.0	000	0.00
Unmitigated Noise Levels (without Topo and		,					
VehicleType Leq Peak Hour Leq Day		q Evening	Leq Nig		Ldn	-	NEL
	71.4 70.9	66.8 65.2		63.5 63.6	72.0	-	72. 72
	70.9 72.3	65.2 69.3		63.6 68.5	71.3	9	72. 75.
	72.3 76.3	69.3 72.2		68.5 70.7	75.	-	75.
Centerline Distance to Noise Contour (in feet		12.2			70.		10
contenine Distance to Noise Contour (III leet	-	70 dBA	65 dB/	1	60 dBA	55	dBA
· · ·	Ldn:	178	384		827		781

	FH	WA-RD-77-108	HIGHV	VAY NC	DISE PI	REDICTIO	N MOL	DEL			
	io: EAPC 2018 e: Waterman nt: n/o Hospita	Av.				Project N Job Nur			y South		
	SPECIFIC IN	NPUT DATA								s	
Highway Data				Si	te Con	nditions (H	lard =	10, So	ft = 15)		
Average Daily	Traffic (Adt):	30,608 vehicle	es				A	Autos:	15		
Peak Hour	Percentage:	10%			Me	dium Truc	ks (2 A	xles):	15		
Peak H	our Volume:	3,061 vehicle	5		He	avy Truck	s (3+ A	xles):	15		
Vel	hicle Speed:	50 mph		V	ehicle	Mix					
Near/Far Lar	ne Distance:	60 feet				icleType	1	Day	Evening	Night	Daily
Site Data						Au	tos: 8	32.9%	7.1%	10.0%	89.44%
Bar	rier Heiaht:	0.0 feet			M	edium Tru	cks: 8	82.8%	5.6%	11.7%	6.54%
Barrier Type (0-W	all, 1-Berm):	0.0			1	Heavy Tru	cks: 6	69.3%	8.7%	22.0%	4.02%
Centerline Dis		50.0 feet		N	oise So	ource Elev	/ations	; (in fe	et)		
Centerline Dist.		50.0 feet				Autos:	0.0	00	,		
Barrier Distance	to Observer:	0.0 feet			Mediu	m Trucks:	2.2	97			
Observer Height (J	,	5.0 feet				/y Trucks:	8.0		Grade Ad	iustment	: 0.0
	ad Elevation:	0.0 feet						-			
	ad Elevation:	0.0 feet		La	ane Eq	uivalent L			eet)		
F	Road Grade:	0.0%				Autos:	40.3				
	Left View:	-90.0 degree	es			m Trucks:	40.0				
	Right View:	90.0 degree	es		Heav	/y Trucks:	40.1	13			
FHWA Noise Mode	el Calculation	is									
VehicleType	REMEL	Traffic Flow	Dista	ance	Finite	Road	Fresne	el I	Barrier Att	en Ber	m Atten
Autos:	70.20	2.08		1.30		-1.20	-	4.65	0.0	000	0.000
Medium Trucks:	81.00	-9.28		1.34		-1.20	-	4.87	0.0	000	0.000
Heavy Trucks:	85.38	-11.39		1.33		-1.20	-	-5.43	0.0	000	0.000
Unmitigated Noise			barrier	attenu	ation)						
	Leq Peak Ho			Leq Eve	v	Leq N	•		Ldn		NEL
Autos:			70.8		66.1		62.8		71.4		71.7
Medium Trucks:			70.2		64.5		63.0		71.2		71.4
Heavy Trucks:	74		71.7		68.7		68.0		75.1		75.3
Vehicle Noise:			75.7		71.6		70.1		77.7	,	78.0
Centerline Distance	ce to Noise C	ontour (in feet)					-			
			L	70 dE		65 dE			0 dBA		dBA
			Ldn:	163		351			756		629
		CI	VEL:	170		366			789	1,	700

Monday, April 17, 2017

Monday, April 17, 2017

	FHW	/A-RD-77-108 HIG	HWAY N	IOISE PR	REDICTIO	N MODEL			
Road Name	b: EAPC 2018 e: Waterman A t: s/o Hospital	Av.				ame: Gat aber: 101	eway South 89		
SITE S	SPECIFIC IN	PUT DATA			NO	ISE MOI	DEL INPUT	S	
Highway Data			1	Site Con	ditions (H	ard = 10,	Soft = 15)		
Average Daily	Fraffic (Adt):	46,128 vehicles				Auto	os: 15		
Peak Hour I	Percentage:	10%		Med	dium Truck	s (2 Axle	s): 15		
Peak Ho	our Volume:	4,613 vehicles		Hea	avy Trucks	(3+ Axle	s): 15		
Vet	nicle Speed:	50 mph	-	Vehicle I	Mar		-		
Near/Far Lar	ne Distance:	60 feet	-		icleType	Dav	Evening	Night	Daily
Site Data				veni	Aut			10.0%	
				Me	Aut dium Truc			11.7%	
	rier Height:	0.0 feet			leavv Truc			22.0%	
Barrier Type (0-Wa		0.0			icavy mac	NS. 09.	570 0.170	22.070	3.30 /
Centerline Dis		50.0 feet	1	Voise So	ource Elev	ations (ii	n feet)		
Centerline Dist. t		50.0 feet			Autos:	0.000			
Barrier Distance t		0.0 feet		Mediur	n Trucks:	2.297			
Observer Height (/	,	5.0 feet		Heav	y Trucks:	8.004	Grade Ac	ljustment	: 0.0
	d Elevation:	0.0 feet	-	ono Er	uivalent D	intenno (in foot)		
	d Elevation:	0.0 feet	-	_ane Equ	Autos:	40.311	n leel)		
F	Road Grade: Left View:	0.0% -90.0 degrees		Madium	n Trucks:	40.091			
	Right View:	90.0 degrees			y Trucks:	40.091			
FHWA Noise Mode	l Calculations	3							
VehicleType	REMEL	Traffic Flow D	istance	Finite	Road	Fresnel	Barrier At	ten Ber	rm Atten
Autos:	70.20	3.89	1.30)	-1.20	-4.6	5 0.	000	0.000
Medium Trucks:	81.00	-7.54	1.34	1	-1.20	-4.8	7 0.	000	0.000
Heavy Trucks:	85.38	-10.14	1.33		-1.20	-5.4	3 0.	000	0.000
Unmitigated Noise									
,,	Leq Peak Hou		Leq Ev	· ·	Leq Nig		Ldn		NEL
Autos:	74.			67.9		64.6	73.		73.5
Medium Trucks:	73.			66.3		64.7	72.		73.2
Heavy Trucks:	75.			70.0		69.2	76.	-	76.6
Vehicle Noise:	79.			73.1		71.5	79.	2	79.5
Centerline Distanc	e to Noise Co	ntour (in feet)	70 0	10.4	65 dB		60 dBA		dBA
		I dn:			65 dB 442	А	60 dBA 952		
		Lan: CNFL :		-	442		952 993		.050 140
		UNEL:	21	4	461		993	2,	140

	FHV	VA-RD-77-108	HIGHW	AY NC	DISE PR	EDICT	ION MC	DEL			
Scenario	: EAPC 2018					Project	Name:	Gatew	ay South		
	: Auto Cente					Job N	umber:	10189			
Road Segmen	t: e/o I-215 Fv	vy.									
	PECIFIC IN	PUT DATA							L INPUT	s	
Highway Data				S	ite Con	ditions	(Hard =	= 10, So	oft = 15)		
Average Daily T	raffic (Adt):	46,205 vehicle	s					Autos:	15		
Peak Hour F	Percentage:	10%			Med	dium Tru	icks (2	Axles):	15		
Peak Ho	ur Volume:	4,621 vehicles			Hea	avy Truc	cks (3+	Axles):	15		
Veh	icle Speed:	40 mph		V	ehicle N	Nix					
Near/Far Lan	e Distance:	60 feet		-		cleType		Day	Evening	Night	Daily
Site Data							Autos:	82.9%	•	10.0%	
	ier Height:	0.0 feet			Me	dium Ti	ucks:	82.8%	5.6%	11.7%	6.45%
Barrier Type (0-Wa		0.0			H	leavy Tr	ucks:	69.3%	8.7%	22.0%	3.60%
Centerline Dist	. ,	50.0 feet									
Centerline Dist. to		50.0 feet		N	oise So				et)		
Barrier Distance to		0.0 feet				Autos		.000			
Observer Height (A		5.0 feet				n Trucks		.297			
0 1	d Flevation:	0.0 feet			Heav	y Trucks	s: 8.	.004	Grade Ad	justment.	0.0
Road	d Elevation:	0.0 feet		Li	ane Equ	iivalent	Distan	ce (in	feet)		
R	oad Grade:	0.0%				Autos	s: 40	.311			
	Left View:	-90.0 degree	s		Mediun	n Trucks	s: 40	.091			
	Right View:	90.0 degree	s		Heav	y Trucks	s: 40	.113			
FHWA Noise Mode	Calculation:	5									
VehicleType	REMEL	Traffic Flow	Distar	псе	Finite	Road	Fres	nel	Barrier Att	en Ber	m Atten
Autos:	66.51	4.86		1.30		-1.20		-4.65	0.0	000	0.00
Medium Trucks:	77.72	-6.58		1.34		-1.20		-4.87	0.0	000	0.00
Heavy Trucks:	82.99	-9.12		1.33		-1.20		-5.43	0.0	000	0.00
Unmitigated Noise											
	eq Peak Hou			eq Eve	· ·	Leq	Night		Ldn		VEL
Autos:	71.		9.9		65.2		61.		70.5		70.
Medium Trucks:	71.		9.7		64.0		62.		70.6		70.
Heavy Trucks:	74.	-	'1.6		68.6		67.	-	74.9		75.
Vehicle Noise:	77.		5.2		71.2		69.	7	77.:	3	77.
Centerline Distance	e to Noise Co	ontour (in feet)	-	70 dE	24	65	dBA	6	0 dBA	55	dBA
		,	.dn:	153			ава 31	1 0	712		ава 534
			IEL:	160			45		743		534 601
		Ch		100	,	3.			140	1,	001

	2: EAPC 201						Drojoot A	-	Cotou	ou Couth		
	e: Orange St	-					Project N Job Nur					
Road Segmen		IOW INU.					300 1101	nber.	10109			
ů					-							
	SPECIFIC I		DATA							L INPUT	S	
Highway Data					S	site Con	ditions (F	lard =		,		
Average Daily	. ,		vehicles	5					Autos:			
	Percentage:	109					dium Truc					
	our Volume:		vehicles			He	avy Truck	s (3+	Axles):	15		
	nicle Speed:		mph		ν	/ehicle I	Nix					
Near/Far Lar	e Distance:	60	feet			Vehi	cleType		Day	Evening	Night	Daily
Site Data		-					Au	tos:	82.9%	7.1%	10.0%	89.86
Bar	rier Heiaht:	0.0	feet			Me	edium Tru	cks:	82.8%	5.6%	11.7%	6.45
Barrier Type (0-W		0.0				ŀ	leavy Tru	cks:	69.3%	8.7%	22.0%	3.69
Centerline Dis	t. to Barrier:	50.0	feet			loise Sc	urce Ele	/atio	ns (in f	eet)		
Centerline Dist. I	o Observer:	50.0	feet		-		Autos:		.000	5017		
Barrier Distance t	o Observer:	0.0	feet			Modiur	n Trucks:		297			
Observer Height (J	Above Pad):	5.0	feet				y Trucks:	-	.004	Grade Ad	liustment	0.0
Pa	d Elevation:	0.0	feet				,				,	
	d Elevation:	0.0	feet		L	ane Equ	uivalent L			feet)		
F	Road Grade:	0.0	1%				Autos:		.311			
	Left View:		degrees				n Trucks:		.091			
	Right View:	90.0	degrees	5		Heav	y Trucks:	40	.113			
FHWA Noise Mode												
	REMEL	Traffic	Flow	Distan	се	Finite	Road	Fres	nel	Barrier Att		m Atter
VehicleType												
Autos:	70.20		3.06		1.30		-1.20		-4.65		000	0.00
Autos: Medium Trucks:	81.00)	-8.38		1.34		-1.20		-4.87	0.0	000	0.00
Autos:)								0.0		0.00
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise	81.00 85.38 Levels (with) 3 hout To	-8.38 -10.81 po and b		1.34 1.33 ttenu	uation)	-1.20 -1.20	inde d	-4.87	0.0	000	0.00
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType	81.00 85.38 Levels (with Leg Peak Ho	hout Top	-8.38 -10.81 po and b Leq Day	Le	1.34 1.33 ttenu	uation) rening	-1.20	<u> </u>	-4.87 -5.43	0.0 0.0 Ldn	000 000 Ci	0.00 0.00
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType Autos:	81.00 85.38 Levels (with Leq Peak Ho	hout Toj hur l 3.4	-8.38 -10.81 po and b Leq Day 7	Le 1.8	1.34 1.33 ttenu	uation) rening 67.1	-1.20 -1.20	63.	-4.87 -5.43	0.0 0.0 <i>Ldn</i> 72.3	000 000 C	0.00 0.00 NEL 72
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType Autos: Medium Trucks:	81.00 85.38 Levels (with Leq Peak Ho 7 7	hout To _l hout To _l bur <u>l</u> 3.4 2.8	-8.38 -10.81 po and b Leq Day 7 7	<i>Le</i> 1.8 1.1	1.34 1.33 ttenu	uation) rening 67.1 65.4	-1.20 -1.20	63. 63.	-4.87 -5.43 8 9	0.0 0.0 <i>Ldn</i> 72.3 72.3	000 000 Ca 3 1	0.00 0.00 NEL 72 72
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType Autos: Medium Trucks: Heavy Trucks:	81.00 85.38 Levels (with Leg Peak Ho 7 7 7	hout Toj bur l 3.4 2.8 4.7	-8.38 -10.81 po and b Leq Day 7 7 7	<i>Le</i> 1.8 1.1 2.3	1.34 1.33 ttenu	vation) rening 67.1 65.4 69.3	-1.20 -1.20	63. 63. 68.	-4.87 -5.43 8 9 6	0.0 0.0 <i>Ldn</i> 72.3 72.7 75.0	000 000 C 3 1 6	0.00 0.00 NEL 72 72 75
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType Autos: Medium Trucks: Heavy Trucks: Vehicle Noise:	81.00 85.38 Levels (with Leq Peak Ho 7. 7. 7. 7. 7. 7.	hout Toj 3 bur l 3.4 2.8 4.7 8.5	-8.38 -10.81 po and b Leq Day 7 7 7 7 7	<i>Le</i> 1.8 1.1	1.34 1.33 ttenu	uation) rening 67.1 65.4	-1.20 -1.20	63. 63.	-4.87 -5.43 8 9 6	0.0 0.0 <i>Ldn</i> 72.3 72.3	000 000 C 3 1 6	0.00 0.00 NEL 72 72 75
Autos: Medium Trucks: Heavy Trucks: Unmitigated Noise VehicleType Autos: Medium Trucks: Heavy Trucks:	81.00 85.38 Levels (with Leq Peak Ho 7. 7. 7. 7. 7. 7.	hout Toj 3 bur l 3.4 2.8 4.7 8.5	-8.38 -10.81 po and b Leq Day 7 7 7 7 7	<i>Le</i> 1.8 1.1 2.3	1.34 1.33 attenu eq Ev	uation) rening 67.1 65.4 69.3 72.4	-1.20 -1.20 Leq N	63. 63. 68. 70.	-4.87 -5.43 8 9 6 8	0.0 0.0 72.3 72. 75.0 78.	000 000 3 1 6 4	0.00 0.00 NEL 72 72 75 78
Autos: Medium Trucks: Heavy Trucks: Unnitigated Noise VehicleType Autos: Medium Trucks: Heavy Trucks: Vehicle Noise:	81.00 85.38 Levels (with Leq Peak Ho 7. 7. 7. 7. 7. 7.	hout Toj 3 bur l 3.4 2.8 4.7 8.5	-8.38 -10.81 po and b Leq Day 7' 7' 7' 7' (in feet)	<i>Le</i> 1.8 1.1 2.3	1.34 1.33 ttenu	uation) rening 67.1 65.4 69.3 72.4 BA	-1.20 -1.20	63. 63. 68. 70.	-4.87 -5.43 8 9 6 8	0.0 0.0 <i>Ldn</i> 72.3 72.7 75.0	000 000 3 1 6 4 55	0.00 0.00 NEL 72 72 75

	FH	WA-RD-77-108	HIGH	VAY NO	DISE PI	REDICTI	ON MOD	EL			
Road Nam	io: EAPC 201 ne: Orange Sh nt: e/o Arrowh	ow Rd.					Vame: G Imber: 10		South		
SITE	SPECIFIC II	VPUT DATA				N	OISE M	ODEL I	NPUTS		
Highway Data				S	ite Cor	nditions (Hard = 1	0, Soft	= 15)		
Average Daily	Traffic (Adt):	29,983 vehicl	es				A	utos:	15		
Peak Hour	Percentage:	10%			Me	dium Tru	cks (2 Ax	des):	15		
Peak H	lour Volume:	2,998 vehicle	s		He	avy Truc	ks (3+ Ax	des):	15		
Ve	hicle Speed:	50 mph		V	ehicle	Miy					
Near/Far La	ne Distance:	60 feet				icleType	Г	ay E	ening I	Vight	Daily
Site Data					Ven			2.9%	~	•	89.70%
Pa	rrier Height:	0.0 feet			М	edium Tru	ucks: 8	2.8%	5.6%	11.7%	6.46%
Barrier Type (0-W	•	0.0 1001				Heavy Tru	ucks: 6	9.3%	8.7%	22.0%	3.84%
Centerline Di	. ,	50.0 feet		-							
Centerline Dist.		50.0 feet		N	oise S	ource Ele)		
Barrier Distance		0.0 feet				Autos					
Observer Height		5.0 feet				m Trucks					
	ad Flevation:	0.0 feet			Heav	/y Trucks	: 8.00)4 Gr	ade Adju	stment:	0.0
Ro	ad Elevation:	0.0 feet		Li	ane Eq	uivalent	Distance	e (in fee	t)		
	Road Grade:	0.0%				Autos	: 40.3	11			
	Left View:	-90.0 degre	es		Mediu	m Trucks	: 40.09	91			
	Right View:	90.0 degre			Heav	/y Trucks	: 40.1	13			
FHWA Noise Mod	el Calculation	15									
VehicleType	REMEL	Traffic Flow	Dista	ance	Finite	Road	Fresne	l Ba	rrier Atter	Bern	n Atten
Autos:	70.20	2.00		1.30		-1.20	-4	4.65	0.00	0	0.000
Medium Trucks:	81.00	-9.43		1.34		-1.20	-4	4.87	0.00	0	0.000
Heavy Trucks:	85.38	-11.68		1.33		-1.20	-	5.43	0.00	0	0.000
Unmitigated Noise	e Levels (with	nout Topo and	barrier	r attenu	ation)						
VehicleType	Leq Peak Ho	ur Leq Da	/ 1	Leq Eve	ening	Leq N	light	Lo	in	CN	EL
Autos:		2.3	70.7		66.1		62.8		71.3		71.6
Medium Trucks:	-	1.7	70.1		64.4		62.8		71.0		71.3
Heavy Trucks:		3.8	71.4		68.4		67.7		74.8		75.0
Vehicle Noise:	7	7.5	75.6		71.4		69.9		77.5		77.8
Centerline Distan	ce to Noise C	ontour (in fee	t)								
			L	70 dE		65 a		60 0		55 0	
			Ldn:	158		34		73	-	1,5	
		С	NEL:	165		35	5	76	i4	1,6	47

Monday, April 17, 2017

Monday, April 17, 2017

Monday, April 17, 2017

Autos: 70.20 1.94 1.30 -1.20 -4.65 0.000 Medium Trucks: 81.00 -9.62 1.34 -1.20 -4.85 0.000 Heavy Trucks: 81.00 -9.62 1.34 -1.20 -4.87 0.000 Umitigate Motise Levels (without Topo and barier attenuation) VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn C Autos: 72.2 70.6 66.0 62.7 71.2 Medium Trucks: 71.5 69.9 64.2 62.6 70.8 Heavy Trucks: 71.5 69.9 64.2 62.6 70.8 Vehicle Noise: 77.0 75.1 70.9 69.3 76.9 Centerline Distance to Noise Contour (in feet) 20 20 20 20 20 20 20 20 65 dBA 60 dBA 56 Ldn: 145 313 674 1 56 574 1		FHW	/A-RD-77-108 HIC	GHWAY N	NOISE PR	REDICTIO	N MODEL			
Highway Data Site Conditions (Hard = 10, Soft = 15) Average Daily Traffic (Adt): 29,311 vehicles Autos: 15 Peak Hour Percentage: 10% Medium Trucks (2 Axkes): 15 Vehicle Speed: 50 mph Medium Trucks (2 Axkes): 15 Vehicle Speed: 60 feet Vehicle Mix Vehicle Mix Vehicle Mix Site Data Vehicle Type Day Evening Night Barrier Height: 0.0 feet Heavy Trucks: 82.9% 7.1% 10.0% Barrier Dist. to Barrier: 50.0 feet Medium Trucks: 82.9% 7.1% 10.0% Centerline Dist. to Observer: 0.0 feet Medium Trucks: 82.9% 7.1% 10.0% Barrier Height: 0.0 feet Medium Trucks: 82.9% 7.1% 10.0% Barrier Dist. to Barrier: 50.0 feet Medium Trucks: 82.9% 7.1% 10.0% Barrier Meight View: 90.0 degrees Right View: 90.0 feet Autos: 4.00.01 Right View: 90.0 degrees Heavy Trucks:<	Road Name:									
Average Daily Traffic (Adt): 29,311 vehicles Autos: 15 Peak Hour Percentage: 10% Medium Trucks (2 Axles): 15 Peak Hour Volume: 2,931 vehicles Medium Trucks (2 Axles): 15 Vehicle Speed: 50 mph Medium Trucks (2 Axles): 15 Site Data Vehicle Max Vehicle Max Vehicle Max Barrier Height: 0.0 feet Mutos: 82.9% 7.1% 10.0% Centerline Dist to Deserver: 0.0 feet Mole Mum Trucks: 82.9% 5.6% 11.7% Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist to Deserver: 0.0 feet Mole Source Elevations (in feet) Centerline Dist to Deserver: 0.0 feet Autos: 0.000 Medium Trucks: 8.004 Grade Adjustmen Road Elevation: 0.0 feet Autos: 4.0031 Medium Trucks: 40.011 Road Elevation: 0.0 feet Medium Trucks: 40.031 Medium Trucks: 40.031 Medium Trucks: 81.00 -9.62 1.34 -1.20 -4.65 0.000	SITE SP	ECIFIC IN	PUT DATA			NO	ISE MODE	L INPUTS	;	
Peak Hour Percentage: 10% Medium Trucks (2 Axles): 15 Peak Hour Volume: 2,931 vehicles Vehicle Speed: 50 mph Near/Far Lane Distance: 60 feet Vehicle Speed: 50 mph Site Data Autos: 82.9% 7.1% 10.0% Barrier Type (OWalt , 1-Berm): 0.0 60 feet Vehicle Speed: 50 mph Barrier Type (OWalt , 1-Berm): 0.0 60 feet Vehicle Speed: 82.9% 7.1% 10.0% Centerline Dist. to Barrier: 50.0 feet Medium Trucks: 82.9% 8.7% 2.0% Deserver Height: 0.0 feet Autos: 0.000 Feed Elevation: 0.0 feet Medium Trucks: 8.004 Grade Adjustmen Road Elevation: 0.0 feet Autos: 40.0311 Medium Trucks: 40.011 Road Elevation: 0.0 feet Lane Equivalent Distance (in feet) Autos: 40.0311 Road Elevation: 0.0 feet Lane Equivalent Distance Finite Road Fresnel Barrier Atten Be Autos: 70.2	way Data				Site Con	ditions (H	ard = 10, S	oft = 15)		
Peak Hour Percentage: 10% Medium Trucks (2 Axles): 15 Peak Hour Volume: 2,931 vehicles Vehicle Speed: 50 mph Near/Far Lane Distance: 60 feet Vehicle Speed: 50 mph Site Data Autos: 82.9% 7.1% 10.0% Barrier Type (OWalt , 1-Berm): 0.0 60 feet Vehicle Speed: 50 mph Barrier Type (OWalt , 1-Berm): 0.0 60 feet Vehicle Speed: 82.9% 7.1% 10.0% Centerline Dist. to Barrier: 50.0 feet Medium Trucks: 82.9% 8.7% 2.0% Deserver Height: 0.0 feet Autos: 0.000 Feed Elevation: 0.0 feet Medium Trucks: 8.004 Grade Adjustmen Road Elevation: 0.0 feet Autos: 40.0311 Medium Trucks: 40.011 Road Elevation: 0.0 feet Lane Equivalent Distance (in feet) Autos: 40.0311 Road Elevation: 0.0 feet Lane Equivalent Distance Finite Road Fresnel Barrier Atten Be Autos: 70.2	Average Dailv Tra	affic (Adt);	29.311 vehicles				Autos	: 15		
Vehicle Speed: Near/Far Lane Distance: 50 mph 60 feet Vehicle Mix Site Data Autos: 82.9% 7.1% 10.0% Barrier Height: 0.0 feet Medium Trucks: 82.9% 5.6% 11.7% Barrier Type (0-Wall, 1-Berm): 0.0 Medium Trucks: 82.8% 5.6% 11.7% Barrier Type (0-Wall, 1-Berm): 0.0 Medium Trucks: 69.3% 8.7% 22.0% Centerline Dist. to Desrver: 0.0 feet Moles Source Elevations (in feet) Medium Trucks: 2.297 Observer Height (Above Pad): 5.0 feet Autos: 8.004 Grade Adjustmen Pad Elevation: 0.0 feet Medium Trucks: 8.004 Grade Adjustmen Road Grade: 0.0% Autos: 40.011 Medium Trucks: 40.011 FHWA Noise Model Calculations Medium Trucks: 40.01 4.87 0.000 Medium Trucks: 81.00 -9.62 1.34 -1.20 -4.65 0.000 Medium Trucks: 85.38 -12.63 1.33 -1.20 -5.43	• •	. ,	- / -		Me	dium Truck	s (2 Axles)	15		
Near/Far Lane Distance: 60 feet Venicle Mix Site Data Autos: 82.9% 7.1% 10.0% Barrier Height: 0.0 feet Medium Trucks: 82.9% 7.1% 10.0% Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Medium Trucks: 82.9% 5.6% 11.7% Barrier Distance to Observer: 50.0 feet Noise Source Elevations (in feet) Content Autos: 0.00 Deserver Height (Above Pad): 5.0 feet Medium Trucks: 8.004 Grade Adjustmen Road Grade: 0.0 feet Medium Trucks: 8.004 Grade Adjustmen Road Grade: 0.0 feet Medium Trucks: 40.091 Heavy Trucks: 40.091 Road Grade: 0.0 feet Medium Trucks: 40.091 Heavy Trucks: 40.091 While Wit: 9.0.0 degrees Heavy Trucks: 40.091 Heavy Trucks: 40.091 Heavy Trucks: 81.00 -9.62 1.34 -1.20 -4.65 0.000 Medium Trucks: <td< td=""><td>Peak Hou</td><td>ir Volume:</td><td>2,931 vehicles</td><td></td><td>He</td><td>avy Trucks</td><td>(3+ Axles)</td><td>15</td><td></td><td></td></td<>	Peak Hou	ir Volume:	2,931 vehicles		He	avy Trucks	(3+ Axles)	15		
Near/Far Lane Distance: 60 feet WehicleType Day Evening Night Site Data Autos: 82.9% 7.1% 10.0% Barrier Type (0-Wall, 1-Berm): 0.0 Medium Trucks: 82.9% 7.1% 10.0% Centerline Dist. to Diserver: 50.0 feet Motion Noise Source Elevations (in feet) Diserver Height (Above Pad): 5.0 feet Autos: 0.00 Medium Trucks: 2.297 Observer Height (Above Pad): 5.0 feet Medium Trucks: 8.040 Grade Adjustmen Road Elevation: 0.0 feet Medium Trucks: 8.004 Grade Adjustmen Road Grade: 0.0% Lane Equivalent Distance (in feet) Medium Trucks: 40.031 FHWA Noise Model Calculations Distance Finite Road Fresnel Barrier Atten Be VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Be Autos: 70.20 1.34 -1.20 -4.65 0.0000 Heavy Trucks: 85.38	Vehic	cle Speed:	50 mph	-			, ,			
Site Data Autos: 82.9% 7.1% 10.0% Barrier Height: 0.0 feet Medium Trucks: 82.9% 7.1% 10.0% Barrier Type (0-Wall, 1-Bern): 0.0 Centerline Dist. to Barrier: 50.0 feet Noise Source Elevations (in feet) Centerline Dist. to Darrier: 50.0 feet Noise Source Elevations (in feet) Noise Source Elevation: 0.000 Diserver Height (Above Pad): 5.0 feet Medium Trucks: 2.297 Road Elevation: 0.0 feet Lane Equivalent Distance (in feet) Noise Model Calculations Vehicle Type REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Be Autos: 70.20 1.94 1.30 -1.20 -4.65 0.000 Heavy Trucks: 81.00 -9.62 1.34 -1.20 -4.65 0.000 Medium Trucks: 85.38 -12.63 1.33 -1.20 -4.65 0.000 Inmitigated Noise Levels (without Topo and barrier attenuation) Vehicle Noise C 0.000 0.0000 <t< td=""><td>Near/Far Lane</td><td>Distance:</td><td>60 feet</td><td>-</td><td></td><td></td><td>Dav</td><td>Fuening</td><td>Night</td><td>Daily</td></t<>	Near/Far Lane	Distance:	60 feet	-			Dav	Fuening	Night	Daily
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist, to Dserver: 50.0 feet Barrier Distance to Observer: 50.0 feet Pad Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees PHWA Noise Model Calculations 1.30 VehicleType REMEL Traffic Flow Vanicie 70.20 1.94 1.30 -1.20 -4.65 0.000 Medium Trucks: 81.00 -9.62 1.34 -1.20 -4.65 0.000 Medium Trucks: 81.00 -9.62 1.34 -1.20 -4.65 0.000 Medium Trucks: 85.38 -12.63 1.33 -1.20 -5.43 0.000 Unnitigated Noise Levels (without Topo and b	Data				ven			0	•	90.53%
Darrier Type Refere Type Resolution Heavy Trucks: 63.3% 8.7% 22.0% Moise Source Elevations (in feet) Centerline Dist. to Diserver: 50.0 feet Noise Source Elevations (in feet) Moise Source Elevations (in feet) Moise Source Elevations (in feet) Diserver Height (Above Pad): 5.0 feet Autos: 0.000 Medium Trucks: 8.040 Grade Adjustmen Road Elevation: 0.0 feet Lane Equivalent Distance (in feet) Autos: 40.311 Left View: 90.0 degrees Medium Trucks: 40.311 Medium Trucks: 40.311 FHWA Noise Model Calculations Distance Finite Road Fresnel Barrier Atten Berley Autos: VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berley Autos: VehicleType Leg Deak Hour Leg Dey Leg Leg Vening Leg Neght Ldn Co VehicleType Leg Deak Hour Leg Dey Leg Resning 66.0 62.7 71.2 Medium Trucks: 71.5 69.9 <t< td=""><td></td><td></td><td></td><td></td><td>14</td><td></td><td></td><td></td><td></td><td>6.31%</td></t<>					14					6.31%
Definition Dist of Deriver: 50.0 feet Noise Source Elevations (in feet) Centerline Dist. to Deriver: 50.0 feet Autos: 0.000 Barrier Distance to Observer: 50.0 feet Autos: 0.000 Deserver Height (Above Pad): 5.0 feet Medium Trucks: 2.297 Observer Height (Above Pad): 5.0 feet Heavy Trucks: 8.004 Grade Adjustmen Road Grade: 0.0 feet Lane Equivalent Distance (in feet) Eaner Atten Bee Road Grade: 0.0 % Autos: 40.091 Eaner Atten Bee Vehicle Type REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Bee Autos: 70.20 1.94 1.30 -1.20 -4.65 0.000 Medium Trucks: 81.00 -9.62 1.34 -1.20 -4.65 0.000 Heavy Trucks: 85.38 -12.63 1.33 -1.20 -4.65 0.000 Unnitigated Noise Levels (without Topo and barrier attenuation) Uvehicle Noise Cent										3.16%
Noise Source Levations (in teet) Noise Source Levations (in teet) Barrier Distance to Observer: 0.0 feet Deserver Height (Above Pad): 5.0 feet Raad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Elevation: 0.0 feet Road Elevation: 0.0 feet Left View: -90.0 degrees Right View: 90.0 degrees Right View: 90.0 degrees Heavy Trucks: 8.0.04 Grade Adjustmen VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Be Mutos: 70.20 1.94 1.30 -1.20 -4.65 0.000 Medium Trucks: 81.00 -9.62 1.33 -1.20 -4.63 0.000 Unnitigated Noise Levels (without Topo and barrier attenuation) U VehicleType Leq Day Leq Evening Leq Night Ldn CC Autos: 72.3 70.5 67.5 66.8 73.8 Vehicle Noise:		. ,	***		,	icavy indo		0 0.170	22.0 %	3.107
Barrier Distance to Observer: 0.0 feet Autos: 0.000 Observer Height (Above Pad): 5.0 feet Medium Trucks: 2.937 Pad Elevation: 0.0 feet Heavy Trucks: 8.004 Grade Adjustmen Road Elevation: 0.0 feet Lane Equivalent Distance (in feet) Intos: 0.311 Road Grade: 0.0% Autos: 40.311 Medium Trucks: 40.311 Left View: 90.0 degrees Medium Trucks: 40.311 Medium Trucks: 40.311 FHWA Noise Model Calculations VenicleType REMEL Traffic Flow Distance Finite Road Freesel Barrier Atten Be Wardium Trucks: 81.00 -9.62 1.34 -1.20 -4.67 0.000 Medium Trucks: 81.00 -9.62 1.34 -1.20 -5.43 0.000 Unnitigated Noise Levels (without Topo and barrier attenuation) Vehicle/Pyee Leq Deak Hour Leq Day Leq Reving Led Nise 70.8 Medium Trucks: 71.5 69.9 64.2 62.6					Noise So	ource Elev	ations (in f	eet)		
Observer Height (Above Pad): 5.0 feet Pad Elevation: Madium Trucks: 2.297 Heavy Trucks: Grade Adjustmen Pad Elevation: 0.0 feet Heavy Trucks: 8.004 Grade Adjustmen Road Grade: 0.0 feet Lane Equivalent Distance (in feet) Image: Constraint of the constra						Autos:	0.000			
Pad Elevation: 0.0 feet Treativity frucks: 8.004 Order Adjustment Road Elevation: 0.0 feet Lane Equivalent Distance (in feet) Lane Equivalent Distance (in feet) Road Grades: 0.0% Autos: 40.311 Left View: -90.0 degrees Medium Trucks: 40.311 Wehleb Type REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Be Vehicle Type REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Be Medium Trucks: 81.00 -9.62 1.34 -1.20 -4.65 0.000 Medium Trucks: 85.38 -12.63 1.33 -1.20 -5.43 0.000 Unnitigated Noise Levels (without Topo and barrier attenuation) VehicleType Leq Day Leq Evening Leg Night Ldn CC Autos: 72.2 70.5 67.5 66.8 70.8 Vehicle Noise: 77.0 75.1 70.9 69.3 76.9 Centerline Distance to Noise Contour (in feet) <td></td> <td></td> <td></td> <td></td> <td>Mediur</td> <td>n Trucks:</td> <td>2.297</td> <td></td> <td></td> <td></td>					Mediur	n Trucks:	2.297			
Road Elevation: 0.0 feet Lane Equivalent Distance (in feet) Road Grade: 0.0% Autos: 40.311 Left View: 90.0 degrees Medium Trucks: 40.031 FHWA Noise Model Calculations Heavy Trucks: 40.113 FHWA Noise Model Calculations Finite Road Fresel Barrier Atten Be VehicleType REMEL Traffic Flow Distance Finite Road Fresel Barrier Atten Be Matus: 70.20 1.94 1.30 -1.20 -4.65 0.000 Medium Trucks: 81.00 -9.62 1.34 -1.20 -4.67 0.000 Heavy Trucks: 85.38 -12.63 1.33 -1.20 -5.43 0.000 Unmitigated Noise Levels (without Topo and barrier attenuation) Vehicle/Noise: 71.2 Co.6 66.0 62.7 71.2 Medium Trucks: 71.5 69.9 64.2 62.6 70.8 Feavy Trucks: 72.9 70.5 67.5 66.8 73.8 Vehicle Noise: 77.0 <td>0 (</td> <td>,</td> <td></td> <td></td> <td>Heav</td> <td>y Trucks:</td> <td>8.004</td> <td>Grade Adju</td> <td>istment:</td> <td>0.0</td>	0 (,			Heav	y Trucks:	8.004	Grade Adju	istment:	0.0
Road Grade: 0.0% Autos: 40.311 Left View: -90.0 degrees Medium Trucks: 40.091 Right View: 90.0 degrees Heavy Trucks: 40.091 FHWA Noise Model Calculations VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Bee Autos: 70.20 1.94 1.30 -1.20 -4.65 0.000 Medium Trucks: 81.00 -9.62 1.34 -1.20 -4.63 0.000 Heavy Trucks: 85.38 -12.63 1.33 -1.20 -5.43 0.000 Umitigated Noise Levels (without Topo and barrier attenuation) VehicleType Leg Neat Leg Neat 0.000 VehicleType Leg Peak Hour Leg Day Leg Revening Leg Night Ldn CC Autos: 72.9 70.5 67.5 66.8 73.8 Vehicle Noise: 77.0 75.1 70.9 69.3 76.9 Centerline Distance to Noise Contour (in feet) To dBA				-	l ano Ea	uivalont D	istanco (in	foot)		
Left View: -90.0 degrees Medium Tracks: 40.091 Right View: 90.0 degrees Heavy Tracks: 40.091 FHWA Noise Model Calculations Heavy Tracks: 40.091 VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Bearlier Atten Medium Tracks: 81.00 -9.62 1.34 -1.20 -4.65 0.000 Medium Tracks: 85.38 -12.63 1.33 -1.20 -5.43 0.000 Unnitigated Noise Levels (without Topo and barrier attenuation) VehicleType Leq Revening Leq Night Ldn CC Autos: 72.2 70.6 66.0 62.7 71.2 Medium Tracks: 71.5 69.9 64.2 62.6 70.8 Vehicle Noise: 77.0 75.1 70.9 69.3 76.9 Centerline Distance to Noise Contour (in feet) 270 dBA 65 dBA 60 dBA 567.4				-	Lane Ly			leel)		
Right View: 90.0 degrees Heavy Trucks: 40.113 FHWA Noise Model Calculations Heavy Trucks: 40.113 VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Be Medium Trucks: 70.20 1.94 1.30 -1.20 -4.65 0.000 Heavy Trucks: 81.00 -9.62 1.34 -1.20 -4.87 0.000 Heavy Trucks: 85.38 -12.63 1.33 -1.20 -5.43 0.000 Unmitigated Noise Levels (without Topo and barrier attenuation) VehicleType Leq Deay Leq Revining Leq Nght Ldn C Medium Trucks: 71.5 69.9 64.2 62.6 70.8 F Heavy Trucks: 77.0 75.1 70.9 69.3 76.9 G Vehicle Noise: 77.0 75.1 70.9 69.3 76.9 G Centerline Distance to Noise Contour (in feet) 145 313 674 1					Modiuu					
VehicleType REMEL Traffic Flow Distance Finite Road Fresnet Barrier Atten Be Autos: 70.20 1.94 1.30 -1.20 -4.65 0.000 Medium Trucks: 81.00 -9.62 1.34 -1.20 -4.65 0.000 Heavy Trucks: 85.38 -12.63 1.33 -1.20 -5.43 0.000 Unmitigated Noise Levels (without Topo and barrier attenuation) Leq Night Ldn C VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn C Medium Trucks: 71.5 69.9 64.2 62.6 70.8 Heavy Trucks: 72.9 70.5 67.5 66.8 73.8 Vehicle Noise: 77.0 75.1 70.9 69.3 76.9 Centerline Distance to Noise Contour (in feet) T0 dBA 65 dBA 60 dBA 57.4			0							
Autos: 70.20 1.94 1.30 -1.20 -4.65 0.000 Medium Trucks: 81.00 -9.62 1.34 -1.20 -4.85 0.000 Heavy Trucks: 81.00 -9.62 1.34 -1.20 -4.87 0.000 Umitigate Motise Levels (without Topo and barier attenuation) VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn C Autos: 72.2 70.6 66.0 62.7 71.2 Medium Trucks: 71.5 69.9 64.2 62.6 70.8 Heavy Trucks: 71.5 69.9 64.2 62.6 70.8 Vehicle Noise: 77.0 75.1 70.9 69.3 76.9 Centerline Distance to Noise Contour (in feet) 20 20 20 20 20 20 20 20 65 dBA 60 dBA 56 Ldn: 145 313 674 1 56 574 1	A Noise Model	Calculations	;							
Medium Trucks: 81.00 -9.62 1.34 -1.20 -4.87 0.000 Heavy Trucks: 85.38 -12.63 1.33 -1.20 -5.43 0.000 Unnitigated Noise Levels (without Topo and barrier attenuation) Ueq Night Ldn C VehiceType Leq Peak Hour Leq Day Leq Night Ldn C Autos: 72.2 70.6 66.0 62.7 71.2 Medium Trucks: 71.5 69.9 64.2 62.6 70.8 Heavy Trucks: 77.0 75.1 70.9 69.3 76.9 Centerline Distance to Noise Contour (in feet) Ldn: 145 313 674 1	ehicleType	REMEL	Traffic Flow L	Distance	Finite	Road	Fresnel	Barrier Atte	n Berr	n Atten
Heavy Trucks: 85.38 -12.63 1.33 -1.20 -5.43 0.000 Unnitigated Noise Levels (without Topo and barrier attenuation) Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CC VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CC Autos: 72.2 70.6 66.0 62.7 71.2 Medium Trucks: 71.5 69.9 64.2 62.6 70.8 Heavy Trucks: 72.9 70.5 67.5 66.8 73.8 Vehicle Noise: 77.0 75.1 70.9 69.3 76.9 Centerline Distance to Noise Contour (in feet) TO dBA 65 dBA 60 dBA 56 Ldn: 145 313 674 1	Autos:	70.20	1.94	1.3	0	-1.20	-4.65	0.00	00	0.00
VehicleTops Leq Neth Leq Day Leq Evening Leq Night Ldn CC Autos: 72.2 70.6 66.0 62.7 71.2 Medium Trucks: 71.5 69.9 64.2 62.6 70.8 Heavy Trucks: 72.9 70.5 67.5 66.8 73.8 Vehicle Noise: 77.0 75.1 70.9 69.3 76.9 Centerline Distance to Noise Contour (in feet) 145 313 674 1	edium Trucks:	81.00	-9.62	1.3	4	-1.20	-4.87	0.00	00	0.00
VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CC Autos: 72.2 70.6 66.0 62.7 71.2 Medium Trucks: 71.5 69.9 64.2 62.6 70.8 Heavy Trucks: 72.9 70.5 67.5 66.8 73.8 Vehicle Noise: 77.0 75.1 70.9 69.3 76.9 Centerline Distance to Noise Contour (in feet)	leavy Trucks:	85.38	-12.63	1.3	3	-1.20	-5.43	0.0	00	0.00
Autos: 72.2 70.6 66.0 62.7 71.2 Medium Trucks: 71.5 69.9 64.2 62.6 70.8 Heavy Trucks: 72.9 70.5 67.5 66.8 73.8 Vehicle Noise: 77.0 75.1 70.9 69.3 76.9 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55.2 Ldn: 145 313 674 1	•			1			1			
Medium Trucks: 71.5 69.9 64.2 62.6 70.8 Heavy Trucks: 72.9 70.5 67.5 66.8 73.8 Vehicle Noise: 77.0 75.1 70.9 69.3 76.9 Centerline Distance to Noise Contour (in feet) Image: Control of the stand o	21	1			v	Leq Ni			CN	IEL
Heavy Trucks: 72.9 70.5 67.5 66.8 73.8 Vehicle Noise: 77.0 75.1 70.9 69.3 76.9 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 Ldn: 145 313 674 1				-						71.
Vehicle Noise: 77.0 75.1 70.9 69.3 76.9 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 Ldn: 145 313 674 1				-						71.
Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA Ldn: 145 313 674 1				-			0010			74.
TO dBA 65 dBA 60 dBA 55 Ldn: 145 313 674 1				1	70.9		69.3	76.9		77.
Ldn: 145 313 674 1	erline Distance	to Noise Co	ntour (in feet)	70	dRΔ	65 AD	4	60 dB4	55	dBA
			I de				~			ива 152
			CNEL			313		704		516
UNILL. 152 52/ /04 1			CIVEL	. 13	52	327		104	1,5	10

	FHV	VA-RD-77-108	HIGH	IWAY NO			DDEL					
Scenari Road Nam Road Segmer		Project Name: Gateway South Job Number: 10189										
SITE S	SITE SPECIFIC INPUT DATA						MODE	L INPUTS	5			
Highway Data				S	ite Condition	s (Hard :	= 10, So	oft = 15)				
Average Daily Traffic (Adt): 27,066 vehicles					Autos: 15 Medium Trucks (2 Axles): 15							
	Percentage:	10%										
	our Volume:	2,707 vehicles	5		Heavy Tr	JCKS (3+	Axies):	15				
ver Near/Far Lar	nicle Speed:	50 mph		V	ehicle Mix							
Near/Far Lar	ie Distance:	60 feet			VehicleTyp	е	Day	Evening	Night	Daily		
Site Data						Autos:	82.9%	7.1%	10.0%	90.51%		
Bar	rier Height:	0.0 feet			Medium	Trucks:	82.8%	5.6%	11.7%	6.389		
Barrier Type (0-W	all, 1-Berm):	0.0			Heavy	Trucks:	69.3%	8.7%	22.0%	3.129		
Centerline Dis	t. to Barrier:	50.0 feet		M	oiso Sourco I	Elovation	ne (in f	not)				
Centerline Dist.	o Observer:	50.0 feet		74	Noise Source Elevations (in feet) Autos: 0.000							
Barrier Distance	o Observer:	0.0 feet			Medium Trucks: 2.297							
Observer Height (J	Above Pad):	5.0 feet			Heavy Trucks: 2.297 Heavy Trucks: 8.004 Grade Adjustment: 0.0							
Pa	d Elevation:	0.0 feet			meavy muc	ns. 0	.004	Orade Haj	usunen.	0.0		
Roa	d Elevation:	0.0 feet		Li	Lane Equivalent Distance (in feet)							
F	Road Grade:	0.0%			Autos: 40.311							
	Left View:	-90.0 degree	es		Medium Trucks: 40.091							
	Right View:	90.0 degree	es		Heavy Truc	ks: 40	.113					
FHWA Noise Mode	Calculation:	S										
VehicleType	REMEL	Traffic Flow	Dis	stance	Finite Road	Fres	nel	Barrier Atte	en Ber	m Atten		
Autos:	70.20	1.60		1.30	-1.20		-4.65	0.0	00	0.00		
Medium Trucks:	81.00	-9.92		1.34	-1.20	-1.20 -4.8		0.0	00	0.00		
Heavy Trucks:	85.38	-13.04		1.33	.33 -1.20 -5			5.43 0.000 0.0				
Unmitigated Noise	Levels (with	out Topo and	barrie	er attenu	ation)							
	Leq Peak Hou			Leq Eve	0	q Night		Ldn		VEL		
Autos:	71.		70.3		65.7	62.		70.9		71.		
Medium Trucks:	71.	-	69.6		63.9	62.3		70.5		70		
Heavy Trucks:	72.	-	70.1		67.1	66.4		73.4		73		
Vehicle Noise:	76		74.8		70.5	68.	9	76.6		76.		
Centerline Distanc	e to Noise Co	ontour (in feet)									
			L	70 dE		5 dBA	6	60 dBA		dBA		
			Ldn:	137		296 309		637 665	,	373		
		CI		143					1.4			

Site Data Autos: 82.9% 7.1% 10.0% 90.45 Barrier Height: 0.0 feet Medium Trucks: 82.9% 7.1% 10.0% 90.45 Barrier Type (0-Wall, 1-Berm): 0.0 Medium Trucks: 82.9% 5.6% 11.7% 6.42 Centerline Dist. to Barrier: 30.0 feet Noise Source Elevations (in feet) Noise Source Elevations 0.00 Distance to Observer: 0.0 feet Mutos: 0.00 Melium Trucks: 2.297 Pad Elevation: 0.0 feet Left View: -90.0 degrees Mutos: 29.518 Wehicle Type RedBL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berrier Atten Autos: 58.73 -7.42 3.26 -1.20 -4.49 0.000 0.0 Medium Trucks: 70.89 Obsended Calculations Entite Road Fresnel Barrier Atten Berrier Atten Mutos: 58.73 -7.42 3.26 -1.20 -4.48 0.000 0.0 A		FH	WA-RD-	77-108	HIGH	WAY	NOISE F	REDICT	10N M	ODEL					
Highway Data Site Conditions (Hard = 10, Soft = 15) Average Daily Traffic (Adt): 1,700 vehicles Autos:: 15 Peak Hour Percentage: 10% Medium Trucks (2 Akes): 15 Peak Hour Volume: 170 vehicles Medium Trucks (2 Akes): 15 Vehicle Speed: 25 mph Medium Trucks (2 Akes): 15 Near/Far Lane Distance: 12 feet Vehicle Mix Vehicle Mix Site Data Autos:: 82.9% 7.1% 10.0% 90.4 Barrier Height: 0.0 feet Heavy Trucks: 82.9% 5.6% 11.7% 6.42 Barrier Jpe (-Wail, 1-Berri): 0.0 feet Heavy Trucks: 82.9% 7.1% 10.0% 90.4 Centerline Dist. to Dserver: 30.0 feet Autos: 2.297 Heavy Trucks: 8.004 Grade Adjustment: 0.0 Pad Elevation: 0.0 feet Autos: 2.9316 Medium Trucks: 2.9316 Road Grade: 0.0% Autos: 29.547 Eare Autos: 29.518 Heavy Trucks: 7.42 <th colspan="5">Road Name: Washington Av.</th> <th></th> <th colspan="9"></th>	Road Name: Washington Av.														
Average Daily Traffic (Adt): 1,700 vehicles Peak Hour Percentage: 10% Peak Hour Percentage: 10% Peak Hour Volume: 170 vehicles Vehicle Speed: 25 mph Near/Far Lane Distance: 12 feet Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Desrver: 30.0 feet Barrier Distance to Observer: 0.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left Ivew: -90.0 degrees Right View: 90.0 degrees Right View: 90.0 degrees Right View: 7.42 3.26 Heavy Trucks: 7.4.2 3.26 1.20 -4.49 0.000 Medium Trucks: 29.518 Heavy Trucks: 7.12 3.33 1.20 -4.49 0.000 Medium Trucks: 29.518 Heavy Trucks: 7.90 0.01 VehicleType		SPECIFIC IN		АТА								S			
Deck Hour Percentage: 10% Medium Trucks (2 Axles): 15 Peak Hour Volume: 170 vehicles Heavy Trucks (3 + Axles): 15 Vehicle Speed: 25 mph Vehicle Mix Vehicle Mix Vehicle Mix Site Data Autos: 62.9% 7.1% 10.0% 90.4 Barrier Height: 0.0 feet Autos: 62.9% 7.1% 10.0% 90.4 Barrier Distance: 30.0 feet Medium Trucks: 62.9% 7.1% 10.0% 90.4 Barrier Distance to Observer: 30.0 feet Medium Trucks: 22.9% 3.14 Observer Height (Abov Padit): 0.0 feet Autos: 0.000 Medium Trucks: 2.297 Road Grade: 0.0% Autos: 2.9.316 Medium Trucks: 2.97 Road Grade: 0.0% Autos: 29.816 Medium Trucks: 2.937 Right View: -90.0 degrees Finite Road Fresnel Barrier Atten Berm Atten Autos: 58.73 -7.42 3.26 -1.20 -	Highway Data						Site Co.	nditions	(Hard		,				
Peak Hour Volume: 170 vehicles Vehicle Speed: 25 mph Near/Far Lane Distance: 12 feet Site Data Vehicle Mix Barrier Height: 0.0 feet Barrier Height: 0.0 feet Barrier Jype (J-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 30.0 feet Barrier Distance to Observer: 0.0 feet Barrier Distance to Observer: 0.0 feet Road Grade 0.0% Left View: -90.0 degrees Right View: 90.0 degrees Right View: 90.0 degrees Vehicle Type Earlier Alten Barrier Atten Vehicle Type Callevation: 0.0 feet Road Grade 0.0% Left View: -90.0 degrees Right View: 90.0 degrees Finite Road Fresnel Barrier Atten Bern Atten Autos: 55.73 7.7.42 3.26 1.20 -4.49 0.000 0.00 Medium Trucks: 77.97 -22.02 3.32 -1.20 -4.86 <	Average Daily	Traffic (Adt):			s										
Vehicle Speed: Near/Far Lane Distance: 25 mph 12 feet Vehicle Mix Site Data Autos: 82.9% 7.1% 10.0% 90.4% Barrier Height: 0.0 feet Medium Trucks: 82.8% 5.6% 11.7% 6.42 Barrier Type (0-Wall, 1-Berm): 0.0 feet Medium Trucks: 82.8% 5.6% 11.7% 6.42 Barrier Type (0-Wall, 1-Berm): 0.0 feet Medium Trucks: 69.3% 8.7% 22.0% 3.14 Centerline Dist. to Dserver: 0.0 feet Moles Source Elevations (in feet) Autos: 0.00 Barrier Distance to Observer: 0.0 feet Autos: 0.00 Medium Trucks: 2.20% 3.14 Road Elevation: 0.0 feet Autos: 2.9816 Medium Trucks: 2.9518 Heavy Trucks: 7.42 3.26 -1.20 -4.49 0.000 0.00 Medium Trucks: 7.98 -1.891 3.33 -1.20 -5.77 0.000 0.00 Medium Trucks: 7.97 -2.202 3.32 -1.20				-					,						
Venicle Mix Venicle Mix Venicle Mix Site Data Venicle Mix Day Evening Night Dayl Site Data Autos: 82.9% 7.1% 10.0% 90.45 Barrier Height: 0.0 feet Medium Trucks: 82.8% 5.6% 11.7% 6.42 Barrier Type (0-Wall, 1-Berm): 0.0 feet Heavy Trucks: 69.3% 8.7% 22.0% 3.14 Centerline Dist. to Barrier: 30.0 feet Molise Source Elevations (in feet) Autos: 0.000 Medium Trucks: 2.297 Heavy Trucks: 8.04 Grade Adjustment: 0.0 Observer Height (Above Pad): 5.0 feet Modium Trucks: 2.9816 Medium Trucks: 2.9518 Road Grade: 0.0 feet Left View: 90.0 degrees Medium Trucks: 29.518 VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berm Atten Autos: 58.73 -7.42 3.26 -1.20 -4.49 0.000			170	vehicles			H	eavy Tru	cks (3-	+ Axles):	15				
Vehicle type Day Description Dois Day Description Dis Description Dis Description Dis Description Dis Description Dis Dis Dis			25	mph		ŀ	Vehicle	Mix					-		
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Deserver: 30.0 feet Deserver Leight (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: 90.0 degrees Right View: 90.0 degrees VehicleType REMEL Traffic Flow Distance Autos: 53.7 7.42 3.26 Autos: 53.7 7.42 3.26 1.20 -4.49 Autos: 53.7 7.42 3.26 1.20 -4.49 Outos: 55.73 7.42 3.26 1.20 -4.49 0.000 0.0 Medium Trucks: 77.42 3.33 -1.20 -4.86 0.000 Medium Trucks: 53.4 54.5 53.3 7.42 3.26 <td>Near/Far La</td> <td>ne Distance:</td> <td>12</td> <td>feet</td> <td></td> <td>ŀ</td> <td>Vei</td> <td>hicleTyp</td> <td>e</td> <td>Day</td> <td>Evening</td> <td>Night</td> <td>Daily</td>	Near/Far La	ne Distance:	12	feet		ŀ	Vei	hicleTyp	e	Day	Evening	Night	Daily		
Barrier Type (IV-Wall, 1-Berm): 0.0 Heavy Trucks: 69.3% 8.7% 22.0% 3.14 Centerline Dist. to Diserver: 30.0 feet Autos: 69.3% 8.7% 22.0% 3.14 Barrier Type (IV-Wall, 1-Berry): 0.0 feet Autos: 0.00 0.0 feet Autos: 0.00 Barrier Distance to Observer: 0.0 feet Autos: 0.00 Medium Trucks: 2.297 Pad Elevation: 0.0 feet Autos: 2.297 Heavy Trucks: 2.297 Road Grade: 0.0% Eet View: -0.00 degrees Autos: 2.9.816 WehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berner Atten Autos: 55.7 -7.42 3.26 -1.20 -4.49 0.000 0.00 Medium Trucks: 70.80 -18.91 3.33 -1.20 -5.77 0.000 0.00 Unnitigated Noise Levels (without Topo and barrier attenuation) VehicleType Eag Peak Hour Leg Day Leg Day	Site Data								Autos:	82.9%	7.1%	10.0%	90.45		
Barrier Type (0-Wall, 1-Berm): 0.0 Heavy Trucks: 69.3% 8.7% 22.0% 3.14 Centerline Dist. to Desriver: 30.0 feet Autos: 0.00 Matter State Autos: 0.00 Desriver Height (Above Pad): 5.0 feet Autos: 0.00 Medium Trucks: 2.297 Pad Elevation: 0.0 feet Autos: 0.00 Medium Trucks: 2.297 Road Grade: 0.0% Autos: 2.9816 Medium Trucks: 2.9816 Left View: 90.0 degrees Medium Trucks: 29.518 Heavy Trucks: 29.518 Heavy Trucks: 7.42 3.26 -1.20 -4.49 0.000 0.00 Medium Trucks: 7.97 -22.02 3.32 -1.20 -5.77 0.000 0.00 Medium Trucks: 7.97 -22.02 3.32 -1.20 -5.77 0.000 0.00 Medium Trucks: 53.4 51.8 47.1 43.8 52.4 55.7 Medium Trucks: 53.4 51.7 52.	Bai	rior Hoight	0.0	foot			N	1edium T	rucks:	82.8%	5.6%	11.7%	6.42		
Centerline Dist. to Observer: 30.0 feet Autos: 0.000 Barrier Distance to Observer: 0.0 feet Autos: 0.000 Dbserver Height (Above Pad) 5.0 feet Medium Trucks: 2.297 Pad Elevation: 0.0 feet Heavy Trucks: 8.004 Grade Adjustment: 0.0 Road Elevation: 0.0 feet Late Equivalent Distance (in feet) Late Equivalent Distance (in feet) Medium Trucks: 2.9316 Keinder Trucks: 9.00 degrees Finite Road Fresnel Barrier Atten Bernier Atten Vehicle Type REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Bern Atten Autos: 58.73 -7.42 3.26 -1.20 -4.49 0.000 0.0 Medium Trucks: 70.80 -18.91 3.33 -1.20 -5.77 0.000 0.00 Unnitigated Noise Levels (without Topo and barrier attenuation) Vehicle Type Leq Day Leq Evening Leq Night Ldn CNEL Autos: 53.4 51.8 4	Barrier Type (0-W	all, 1-Berm):	0.0					Heavy T	rucks:	69.3%	8.7%	22.0%	3.14		
Barrier Distance to Observer: 0.0 feet Autos: 0.000 Observer Height (Above Pad): 5.0 feet Medium Trucks: 2.297 Pad Elevation: 0.0 feet Heavy Trucks: 8.004 Grade Adjustment: 0.0 Road Elevation: 0.0 feet Left View: 90.0 degrees Autos: 29.816 Road Grade: 0.0% Autos: 29.816 Medium Trucks: 29.518 VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berm Atten Autos: 58.73 -7.42 3.26 -1.20 -4.49 0.000 0.00 Medium Trucks: 70.80 -18.91 3.33 -1.20 -5.77 0.000 0.00 Unnitigated Noise Levels (without Topo and barrier attenuation) VehicleType Leq Day Leq Day Leq Right Ldn CNL Autos: 53.4 51.8 47.1 43.8 52.4 55. Medium Trucks: 54.0 52.4 46.7 45.1 <t< td=""><td></td><td></td><td></td><td></td><td></td><td>ſ</td><td>Noise S</td><td>ource E</td><td>levatio</td><td>ons (in fe</td><td>eet)</td><td></td><td></td></t<>						ſ	Noise S	ource E	levatio	ons (in fe	eet)				
Observer Height (Above Pad): 5.0 feet Pad Elevation: Medium Trucks: 2.297 Heavy Trucks: B.004 Grade Adjustment: 0.0 Road Elevation: 0.0 feet Itel views: 9.00 degrees Itel views: 9.00 degrees Itel views: 29.816 Left View: -90.0 degrees Medium Trucks: 29.518 Heavy Trucks: 29.518 FHWA Noise Model Calculations VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Bern Atten Autos: 58.73 -7.42 3.26 -1.20 -4.49 0.000 0.00 Medium Trucks: 70.80 -18.91 3.33 -1.20 -4.86 0.000 0.00 Unnitigated Noise Levels (without Topo and barrier attenuation) Ueg Evening Leq Evening Leq Night Ldn CNEL Autos: 53.4 51.8 47.1 43.8 52.4 55.7 Medium Trucks: 58.1 55.7 52.7 52.0 59.0 55.7 VehicleType <td></td> <td></td> <td></td> <td></td> <td></td> <td>Ī</td> <td></td> <td>Auto</td> <td>s:</td> <td>0.000</td> <td></td> <td></td> <td></td>						Ī		Auto	s:	0.000					
Pad Elevation: 0.0 feet Heavy Trucks: 8.004 Grade Adjustment. 0.0 Road Elevation: 0.0 feet Lane Equivalent Distance (in feet) Lane Equivalent Distance (in feet) Lane Equivalent Distance (in feet) Additional additex additin additera additional additionadditex additional additio							Mediu	ım Truck	s:	2.297					
Road Elevation: 0.0 feet Lane Equivalent Distance (in feet) Road Grade: 0.0% Autos: 29.816 Left Ivew: -90.0 degrees Medium Trucks: 29.518 Right View: 90.0 degrees Heavy Trucks: 29.518 VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berner Atten Autos: 55.7 -7.42 3.26 -1.20 -4.49 0.000 0.0 Medium Trucks: 70.80 -18.91 3.33 -1.20 -5.77 0.000 0.0 Unnitigated Noise Levels (without Topo and barrier attenuation) VehicleType Leq Deak Hour Leq Day Leq Right Ldn CNEL Autos: 53.4 51.8 47.1 43.8 52.4 55 Medium Trucks: 54.0 52.4 46.7 45.1 53.3 56 Heavy Trucks: 58.1 55.7 52.0 53.3 60.7 66 Medium Trucks: 54.0 52.4		,					Hea	vy Truck	s:	8.004	Grade Ad	ljustment	: 0.0		
Road Grade: 0.0% Autos: 29.816 Left View: -90.0 degrees Medium Trucks: 29.518 Heavy Trucks: 29.547 FHWA Noise Model Calculations VehicleType Releft Traffic Flow Distance Finite Road Fresnel Barrier Atten Berner Atten VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berner Atten Autos: 58.73 -7.42 3.26 -1.20 -4.49 0.000 0.0 Medium Trucks: 70.80 -18.91 3.33 -1.20 -4.86 0.000 0.0 Heavy Trucks: 77.97 -22.02 3.32 -1.20 -5.77 0.000 0.00 Unnitigated Noise Levels (without Topo and barrier attenuation) VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Autos: 53.4 51.8 47.1 43.8 52.4 55.7 Medium Trucks: 58.1 55.7 52.7 52.0						-	1 5		4 Di - 4-		6				
Left View: -90.0 degrees Medium Trucks: 29.518 Right View: 90.0 degrees Heavy Trucks: 29.547 FHWA Noise Model Calculations VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berma Atten Autos: 55.73 -7.42 3.26 -1.20 -4.49 0.000 0.0 Medium Trucks: 70.80 -18.91 3.33 -1.20 -4.49 0.000 0.0 Medium Trucks: 77.97 -22.02 3.32 -1.20 -5.77 0.000 0.00 Unnitigated Noise Levels (without Topo and barrier attenuation) VehicleType Leq Day Leq Evening Leq Night Ldn CNEL Autos: 53.4 51.8 47.1 43.8 52.4 55 Medium Trucks: 58.1 55.7 52.0 59.0 55 Heavy Trucks: 58.1 55.7 52.3 60.7 66 Heavy Trucks: 58.1 55.7 <						ŀ	Lane E				reet)				
Right View. 90.0 degrees Heavy Trucks: 29.547 FHWA Noise Model Calculations Heavy Trucks: 29.547 VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berner Atten Autos: 58.73 -7.42 3.26 -1.20 -4.49 0.000 0.0 Medium Trucks: 70.80 -18.91 3.33 -1.20 -5.77 0.000 0.0 Heavy Trucks: 77.97 -22.02 3.32 -1.20 -5.77 0.000 0.0 Unmitigated Noise Levels (without Topo and barrier attenuation) VehicleType Leq Peak Hour Leq Qay Leq Evening Leq Night Ldn CNEL Autos: 53.4 51.8 47.1 43.8 52.4 55.7 Heavy Trucks: 58.1 55.7 52.7 52.0 59.0 56 Vehicle Noise: 60.5 58.4 54.5 53.3 60.7 6 Centerline Distance to Noise Contour (in feet) 70 dBA							11-1								
VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Bern Atten Autos: 58.73 -7.42 3.26 -1.20 -4.49 0.000 0.0 Medium Trucks: 70.80 -18.91 3.33 -1.20 -4.49 0.000 0.0 Heavy Trucks: 77.97 -22.02 3.32 -1.20 -5.77 0.000 0.0 Unmitigated Noise Levels (without Topo and barrier attenuation) -4.86 0.000 0.0 VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Matos: 53.4 51.8 47.1 43.8 52.4 55.7 Heavy Trucks: 58.1 55.7 52.7 52.0 59.0 56 Vehicle Noise: 60.5 58.4 54.5 53.3 60.7 6 Centerline Distance to Noise Contour (in feet)							20.010								
Autos: 58.73 -7.42 3.26 -1.20 -4.49 0.000 0.0 Medium Trucks: 70.80 -18.91 3.33 -1.20 -4.86 0.000 0.0 Heavy Trucks: 77.97 -22.02 3.32 -1.20 -5.77 0.000 0.0 Umitigated Noise Levels (without Top cand barrier attenuation) Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Autos: 53.4 51.8 47.1 43.8 52.4 53. Medium Trucks: 54.0 52.4 46.7 45.1 53.3 53. Medium Trucks: 58.1 55.7 52.7 52.0 59.0 58 Vehicle Noise: 60.5 58.4 54.5 53.3 60.7 6 Centerline Distance to Noise Contour (in feet)	FHWA Noise Mode	el Calculation	IS												
Medium Trucks: 70.80 -18.91 3.33 -1.20 -4.86 0.000 0.0 Heavy Trucks: 77.97 -22.02 3.32 -1.20 -5.77 0.000 0.0 Unnitigated Noise Levels (without Topo and barrier attenuation) Verlie37/yee Leg Peak Hour Leg Day Leg Right Ldn CNEL Autos: 53.4 51.8 47.1 43.8 52.4 55.7 Medium Trucks: 54.0 52.4 46.7 45.1 53.3 55.7 Heavy Trucks: 58.1 55.7 52.7 52.0 59.0 58 Vehicle Noise: 60.5 58.4 54.5 53.3 60.7 67 Centerline Distance to Noise Contour (in feet) Image: Total Action	VehicleType	REMEL	Traffic	: Flow	Dis	tance	Finite	e Road	Fre	snel	Barrier At	ten Bei	m Atter		
Heavy Trucks: 77.97 -22.02 3.32 -1.20 -5.77 0.000 0.00 Unnitigated Noise Levels (without Topo and barrier attenuation) Leq Day Leq Evening Leq Night Ldn CNEL VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Matus: 53.4 51.8 47.1 43.8 52.4 53.1 Medium Trucks: 54.0 52.7 52.0 59.0 56 Vehicle Noise: 60.5 58.4 54.5 53.3 60.7 66 Vehicle Noise: 60.5 58.4 54.5 53.3 60.7 66 Centerline Distance to Noise Contour (in feet) T0 dBA 65 dBA 60 dBA 55 dBA Ldn: 7 16 34 72	Autos:	58.73		-7.42		3.2	26	-1.20		-4.49	0.	000	0.00		
VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Autos: 53.4 51.8 47.1 43.8 52.4 55. Medium Tucks: 54.0 52.4 46.7 45.1 53.3 55.7 Medium Tucks: 58.1 55.7 52.7 52.0 59.0 58 Vehicle Noise: 60.5 58.4 54.5 53.3 60.7 67 Centerline Distance to Noise Contour (in feet) T0 dBA 65 dBA 60 dBA 55 dBA Ldn: 7 16 34 72	Medium Trucks:	70.80		-18.91		3.3	33	-1.20		-4.86	0.	000	0.00		
VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Autos: 53.4 51.8 47.1 43.8 52.4 55.7 Medium Trucks: 54.0 52.4 46.7 45.1 53.3 55.7 Heavy Trucks: 58.1 55.7 52.7 52.0 59.0 56 Vehicle Noise: 60.5 58.4 54.5 53.3 60.7 67 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA Ldn: 7 16 34 72	,						-			-5.77	0.	000	0.00		
Autos: 53.4 51.8 47.1 43.8 52.4 55.7 Medium Trucks: 54.0 52.4 46.7 45.1 53.3 55.7 Heavy Trucks: 58.1 55.7 52.7 52.0 59.0 55.7 Vehicle Noise: 60.5 58.4 54.5 53.3 60.7 67 Centerline Distance to Noise Contour (in feet) To dBA 65 dBA 60 dBA 55 dBA Lchr: 7 16 34 72	-				-					-					
Medium Trucks: 54.0 52.4 46.7 45.1 53.3 55.7 Heavy Trucks: 58.1 55.7 52.7 52.0 59.0 55.7 Vehicle Noise: 60.5 58.4 54.5 53.3 60.7 66 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA Ldn: 7 16 34 72	, ,					Leq E									
Heavy Trucks: 58.1 55.7 52.7 52.0 59.0 50.0 50.0 50.0															
Vehicle Noise: 60.5 58.4 54.5 53.3 60.7 67 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA Ldn: 7 16 34 72		-										-			
Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA Ldn: 7 16 34 72						0						59.			
70 dBA 65 dBA 60 dBA 55 dBA Ldn: 7 16 34 72							54.5	ō.	53	3.3	60.	7	61		
Ldn: 7 16 34 72	Centerline Distant	e to Noise C	ontour	(in teet)	1	70	dDA	65	dPA		SO dPA	55	dDA		
				,	dn										
CIVEL. 0 10 33 75				-							- ·				
				Ch			0		10		00		10		

	FH	WA-RD-77-108	3 HIGH	IWAY N	OISE PI	REDICTIC	N MODE	L				
	e: Waterman		ct				lame: Ga nber: 10 ⁻	teway South 189				
	SITE SPECIFIC INPUT DATA							DEL INPUT	rs			
Highway Data				5	Site Cor	nditions (H	lard = 10	, Soft = 15)				
Average Daily	Traffic (Adt):	31,800 vehic	les				Au	los: 15				
Peak Hour	Percentage:	10%			Me	dium Truc	ks (2 Axle	es): 15				
Peak H	lour Volume:	3,180 vehicles			He	avy Truck	s (3+ Axle	es): 15				
Ve	hicle Speed:	50 mph	50 mph		/ehicle	Mix						
Near/Far La	ne Distance:	60 feet				icleType	Da	y Evening	Night	Daily		
Site Data						Au	tos: 82	.9% 7.1%	10.0%	90.45%		
Bai	rrier Heiaht:	0.0 feet			М	edium Tru	cks: 82	.8% 5.6%	11.7%	6.42%		
Barrier Type (0-W		0.0			1	Heavy Tru	cks: 69	.3% 8.7%	22.0%	3.14%		
Centerline Dis		50.0 feet		/	loise S	ource Ele	vations (n feet)				
Centerline Dist.	to Observer:	50.0 feet				Autos:		,				
Barrier Distance		0.0 feet			Mediu	m Trucks:	2.297					
Observer Height (,	5.0 feet				/y Trucks:	8.004	Grade Ad	djustment	: 0.0		
	ad Elevation:	0.0 feet		_					,			
	ad Elevation:	0.0 feet		1	Lane Equivalent Distance (in feet)							
1	Road Grade:	0.0% -90.0 degre				Autos:	40.31					
	Left View:					m Trucks:	40.09					
	Right View:	90.0 degre	es		Heav	/y Trucks:	40.113	3				
FHWA Noise Mode	el Calculation	15										
VehicleType	REMEL	Traffic Flow	Dis	stance	Finite	Road	Fresnel	Barrier At	tten Bei	rm Atten		
Autos:	70.20	2.29		1.30)	-1.20	-4.	65 O.	.000	0.000		
Medium Trucks:	81.00			1.34		-1.20		•••	.000	0.000		
Heavy Trucks:	85.38	-12.31		1.33	5	-1.20	-5.	43 0.	.000	0.000		
Unmitigated Noise												
VehicleType	Leq Peak Ho			Leq Ev		Leq N	•	Ldn		NEL		
Autos:		2.6	71.0		66.4		63.0	71.		71.9		
Medium Trucks:	-	1.9	70.3		64.6		63.1	71.		71.5		
Heavy Trucks:		3.2	70.8		67.8		67.1	74.		74.4		
Vehicle Noise:		7.4	75.5		71.2		69.6	77.	.3	77.6		
Centerline Distant	ce to Noise C	ontour (in fee	t)									
			L	70 a		65 dl		60 dBA		dBA		
					153 330 160 345			711		1,533		
		C	NEL:	16	U	345	b	743	1,	600		

Monday, April 17, 2017

Monday, April 17, 2017

	FH	WA-RD-77-10	8 HIG	HWAY N	DISE PF	REDICTIO	N MODE	ΞL		
	e: Waterman		ect			Project Na Job Nurr		ateway South 189		
SITE S	SPECIFIC IN	VPUT DATA	1			NO	ISE MO	DEL INPU	TS	-
Highway Data				S	ite Con	ditions (H	ard = 10), Soft = 15)		
Average Daily Peak Hour Peak H	, ,	33,800 vehi 10% 3,380 vehic				dium Truck avy Trucks	is (2 Axi	,		
	nicle Speed:	50 mph		V	ehicle l	Mix				
Near/Far Lar	e Distance:	60 feet			Veh	icleType	Di	ay Evening	Night	Daily
Site Data						Aut		2.9% 7.1%		,
Bar	rier Height:	0.0 feet			Me	edium Truc	ks: 82	2.8% 5.6%	6 11.79	6.42%
Barrier Type (0-W	all, 1-Berm):	0.0			ŀ	leavy Truc	ks: 69	9.3% 8.7%	6 22.09	% 3.14%
Centerline Dis		50.0 feet		٨	loise So	ource Elev	ations (in feet)		
Centerline Dist. t		50.0 feet				Autos:	0.00	0		-
Barrier Distance t		0.0 feet			Mediur	n Trucks:	2.29	7		
Observer Height ()	,	5.0 feet			Heav	y Trucks:	8.00	4 Grade A	djustmer	nt: 0.0
	d Elevation:	0.0 feet								
	d Elevation:	0.0 feet		L	ane Eq	uivalent D		· /		
F	Road Grade:	0.0%				Autos:	40.31			
	Left View: Right View:	-90.0 degr 90.0 degr				n Trucks: y Trucks:	40.09 40.11			
FHWA Noise Mode	l Calculation	ıs								
VehicleType	REMEL	Traffic Flow	Dis	stance	Finite	Road	Fresnel	Barrier A	tten Be	erm Atten
Autos:	70.20	2.5	6	1.30		-1.20	-4	.65 0	0.000	0.00
Medium Trucks:	81.00	-8.9	3	1.34		-1.20	-4	.87 0	0.000	0.00
Heavy Trucks:	85.38			1.33		-1.20	-5	.43 0	0.000	0.00
Unmitigated Noise					<i></i>					
	Leq Peak Ho		/	Leq Ev	~	Leq Nig		Ldn		CNEL
Autos:		2.9	71.3		66.6		63.3		.8	72.
Medium Trucks:		2.2	70.6		64.9		63.3		.5	71.
Heavy Trucks:		3.5	71.1		68.1		67.3		1.4	74.
Vehicle Noise:		7.6	75.8		71.5		69.9	77	7.6	77.
Centerline Distanc	e to Noise C	ontour (in fe	et)	70 d	BA	65 dB	A	60 dBA	5	5 dBA
			Ldn:	160		344		741		1.596
			CNFL:	16		359		774		1,667
				10		000				.,

	FHW	A-RD-77-108	HIGH	IWAY N	IOISE PR	EDICT	ION MO	DEL			
Scenario: Ye	ar 2040 W	ithout Project				Project	t Name:	Gatew	ay South		
Road Name: Wa	aterman A	v.				Job N	lumber:	10189			
Road Segment: s/o	Park Cen	ter Dr.									
SITE SPEC	IFIC INP	UT DATA							L INPUT	s	
Highway Data				:	Site Cond	litions	(Hard =	10, Se	oft = 15)		
Average Daily Traffic	(Adt): 4	1,600 vehicle	s					Autos:	15		
Peak Hour Perce	ntage:	10%			Med	lium Tr	ucks (2 A	Axles):	15		
Peak Hour Vo	olume: 4	,160 vehicles	5		Hea	ivy Tru	cks (3+ A	Axles):	15		
Vehicle S	Speed:	50 mph			Vehicle N	lix					
Near/Far Lane Dis	tance:	60 feet		F		leType	e	Day	Evening	Night	Daily
Site Data								82.9%	•	10.0%	
Barrier H	eiaht [.]	0.0 feet			Me	dium T	rucks:	82.8%	5.6%	11.7%	6.429
Barrier Type (0-Wall, 1-L		0.0			н	eavy T	rucks:	69.3%	8.7%	22.0%	3.149
Centerline Dist. to E	,	50.0 feet		H							
Centerline Dist. to Obs		50.0 feet		1	Noise So				eet)		
Barrier Distance to Obs		0.0 feet				Auto		000			
Observer Height (Above	Pad);	5.0 feet			Medium			297	Our de Ad		
Pad Ele		0.0 feet			Heavy	/ Truck	:s: 8.0	004	Grade Ad	ustment	0.0
Road Ele	vation:	0.0 feet		1	Lane Equ	ivalen	t Distan	ce (in	feet)		
Road (Grade:	0.0%				Auto	s: 40.	311			
Left	View:	-90.0 degree	s		Medium	n Truck	s: 40.	091			
Right	View:	90.0 degree	!S		Heavy	/ Truck	s: 40.	113			
FHWA Noise Model Cal											
		Traffic Flow	Dis	stance	Finite I		Fresh		Barrier Att		m Atten
Autos:	70.20	3.46		1.30		-1.20		-4.65		000	0.00
Medium Trucks:	81.00	-8.03		1.34		-1.20		-4.87		000	0.00
Heavy Trucks:	85.38	-11.14		1.33	3	-1.20		-5.43	0.0	000	0.00
Unmitigated Noise Leve								1			
	eak Hour			Leg Ei	vening	Leq	Night		Ldn	-	VEL
Autos:	73.8		72.2		67.5		64.2		72.7		73.
Medium Trucks:	73.1		71.5		65.8		64.2		72.4		72.
Heavy Trucks:	74.4		72.0		69.0		68.2		75.3		75. 78.
Vehicle Noise:	78.5		76.7		72.4		70.8	3	78.5)	78
Centerline Distance to N	voise Cor	tour (in feet)	' 	70 0	1RA	65	dBA		0 dBA	55	dBA
			Ldn:	18			95		851		833
			JFI :	19			12		888		914

	FH\	WA-RD-77-108	HIGH	WAY N	OISE P	REDICT	ION MO	DDEL			
Scenario: Road Name: Road Segment:	Waterman		t				t Name: lumber:		vay South		
SITE SI	PECIFIC IN	IPUT DATA								5	
Highway Data				S	Site Cor	nditions	(Hard :	= 10, S	oft = 15)		
Average Daily Tr		35,700 vehicl	es					Autos:			
Peak Hour Pe	ercentage:	10%				edium Tr					
Peak Hou	ır Volume:	3,570 vehicle	s		He	eavy Tru	cks (3+	Axles):	15		
	cle Speed:	50 mph		V	/ehicle	Mix					
Near/Far Lane	Distance:	60 feet		-	Veh	icleType	9	Day	Evening	Night	Daily
Site Data							Autos:	82.9%	5 7.1%	10.0%	90.45%
Barri	er Heiaht:	0.0 feet			М	edium T	rucks:	82.8%	5.6%	11.7%	6.42%
Barrier Type (0-Wal		0.0				Heavy T	rucks:	69.3%	8.7%	22.0%	3.14%
Centerline Dist.	. ,	50.0 feet			laiaa C	ource E	lovatio	no (in f	0.04)		
Centerline Dist. to	Observer:	50.0 feet		-	ioise 3	Auto			eel)		
Barrier Distance to	Observer:	0.0 feet			Marth	Auto m Truck		0.000 2.297			
Observer Height (Al	oove Pad):	5.0 feet						.004	Grade Ad	ustmont	0.0
Pad	Elevation:	0.0 feet			Hea	vy Truck	:S: 8	6.004	Grade Auj	usuneni	0.0
Road	Elevation:	0.0 feet		L	.ane Eq	uivalen	t Distaı	nce (in	feet)		
Ro	ad Grade:	0.0%				Auto	s: 40).311			
	Left View:	-90.0 degre	es		Mediu	m Truck	is: 40	0.091			
F	Right View:	90.0 degre	es		Hea	vy Truck	:s: 40).113			
FHWA Noise Model		-									
VehicleType	REMEL	Traffic Flow	Dist	tance		Road	Fres		Barrier Att		m Atten
Autos:	70.20	2.80		1.30		-1.20		-4.65	0.0		0.00
Medium Trucks:	81.00			1.34		-1.20		-4.87	0.0		0.00
Heavy Trucks:	85.38			1.33		-1.20		-5.43	0.0	00	0.00
Unmitigated Noise L								-			
	eq Peak Hou			Leq Ev		,	Night	_	Ldn		VEL
Autos: Medium Trucks:	73		71.5 70.8		66.9 65.1		63. 63.		72.1 71.8		72.
Heavy Trucks: Vehicle Noise:	73		71.3 76.0		68.3 71.7		67. 70.		74.6		74.9
					/1./		70.	.1	11.8)	78.
Centerline Distance	to Noise C	ontour (in feel	2	70 d	RΔ	65	dBA		60 dBA	55	dBA
			I dn:	16			57		768		655

	FH	WA-RD-77-108	B HIGHW	AY NO	OISE PF	REDICTIC	ON MOI	DEL			
Road Nan	io: Year 2040 ne: Waterman nt: s/o Hospita		rt -			Project N Job Nu			ay South		
SITE	SPECIFIC I	NPUT DATA				NO	DISE N	IODE		s	
Highway Data				S	ite Con	ditions (I	Hard =	10, So	ft = 15)		
Average Daily	Traffic (Adt):	54,700 vehicl	es				/	Autos:	15		
Peak Hour	Percentage:	10%			Me	dium Truc	cks (2 A	xles):	15		
Peak H	lour Volume:	5,470 vehicle	s		He	avy Truck	ks (3+ A	xles):	15		
Ve	hicle Speed:	50 mph		v	ehicle l	Mix					
Near/Far La	ne Distance:	60 feet		-		icleType		Day	Evening	Night	Daily
Site Data								82.9%	7.1%	10.0%	
Ba	rrier Height:	0.0 feet			Me	edium Tru		82.8%	5.6%	11.7%	
Barrier Type (0-W		0.0			F	leavy Tru	icks:	69.3%	8.7%	22.0%	3.14%
Centerline Di	. ,	50.0 feet		-							
Centerline Dist.		50.0 feet		N	loise Sc	ource Ele			et)		
Barrier Distance	to Observer:	0.0 feet				Autos:	0.0				
Observer Height	(Above Pad):	5.0 feet				m Trucks:			Grade Ad	iustmont	
P	ad Elevation:	0.0 feet			Heav	y Trucks:	8.0	104	Grade Au	usuneni	. 0.0
Ro	ad Elevation:	0.0 feet		L	ane Eq	uivalent l	Distand	e (in f	eet)		
	Road Grade:	0.0%				Autos:	40.3	311			
	Left View:	-90.0 degre	es			m Trucks:)91			
	Right View:	90.0 degre	es		Heav	y Trucks:	40.1	113			
FHWA Noise Mod	el Calculation	IS									
VehicleType	REMEL	Traffic Flow	Dista	nce	Finite	Road	Fresn	el i	Barrier Att	en Ber	m Atten
Autos:	70.20	4.65		1.30		-1.20		-4.65	0.0	000	0.000
Medium Trucks:	81.00			1.34		-1.20		-4.87		000	0.000
Heavy Trucks:	85.38	-9.95		1.33		-1.20		-5.43	0.0	000	0.000
Unmitigated Nois			barrier	attenu	lation)						
VehicleType	Leq Peak Ho			eq Ev	•	Leq N	·		Ldn		NEL
Autos:		5.0	73.3		68.7		65.4		73.9		74.3
Medium Trucks:	-	1.3	72.7		67.0		65.4		73.6		73.9
Heavy Trucks:		5.6	73.2		70.2		69.4		76.5		76.8
Vehicle Noise:		9.7	77.8		73.6		72.0		79.7	7	79.9
Centerline Distan	ce to Noise C	ontour (in fee	t)	70 di	DA I	65 d	БЛ	6	0 dBA	FF	dBA
			Ldn:	220		474			1.021		200
		0	NEL:	220		474			1,021		200 297
		0		230	5	45.			,000	2,	201

Monday, April 17, 2017

Monday, April 17, 2017

Monday, April 17, 2017

	FHV	VA-RD-77-108	HIGHW	AY NC	ISE PF	REDICTIO	N MOE	EL			
	e: Auto Cente					Project Na Job Num			ay South		
SITE S	SPECIFIC IN	IPUT DATA				NO	ISE M	ODE		s	
Highway Data				Si	te Con	ditions (H	ard = 1	10, So	ft = 15)		
Average Daily T Peak Hour I	, ,	39,100 vehicle 10%	s		Me	dium Truck		utos: xles):	15 15		
Peak Ho	our Volume:	3,910 vehicles			He	avy Trucks	(3+ A	xles):	15		
Veł Near/Far Lar	nicle Speed: ne Distance:	40 mph 60 feet		Ve	hicle l	Vix icleType		Day	Evening	Night	Daily
Site Data					VOII	Aut		32.9%	7.1%	10.0%	,
Ban	rier Height:	0.0 feet				edium Truc Ieavy Truc	ks: E	32.8%	5.6%	11.7%	6.42%
Barrier Type (0-Wa	. ,	0.0			r	leavy Iluc	кs. е	69.3%	8.7%	22.0%	3.149
Centerline Dis		50.0 feet		N	oise So	ource Elev	ations	(in fe	et)		
Centerline Dist. t Barrier Distance t	o Observer:	50.0 feet 0.0 feet			Mediui	Autos: n Trucks:	0.0 2.2		,		
Observer Height (/ Pa	Above Pad): d Elevation:	5.0 feet 0.0 feet				y Trucks:	8.0	-	Grade Adj	justment	: 0.0
	d Elevation:	0.0 feet		Lá	ne Eq	uivalent D			eet)		
F	Road Grade:	0.0%				Autos:	40.3				
	Left View: Right View:	-90.0 degree 90.0 degree				n Trucks: y Trucks:	40.0 40.1				
FHWA Noise Mode	l Calculation	s									
VehicleType	REMEL	Traffic Flow	Distan	ce	Finite	Road	Fresne	el i	Barrier Att	en Bei	rm Atten
Autos:	66.51	4.16		1.30		-1.20	-	4.65	0.0	000	0.00
Medium Trucks:	77.72	-7.33		1.34		-1.20	-	4.87	0.0	000	0.00
Heavy Trucks:	82.99	-10.44		1.33		-1.20	-	5.43	0.0	000	0.00
Unmitigated Noise			barrier a	ttenu	ation)						
21	Leq Peak Hou			eq Eve	· ·	Leq Nig			Ldn		NEL
Autos:	70		9.2		64.5		61.2		69.8	-	70.
Medium Trucks:	70		6.9		63.2		61.6		69.8	-	70.
Heavy Trucks:	72		0.3		67.3		66.6		73.6		73.
Vehicle Noise:	76		4.3		70.1		68.6		76.2	2	76.
Centerline Distanc	e to Noise Co	ontour (in feet)		70 dE	A	65 dB	A	6	0 dBA	55	dBA
		,	.dn:	130		281	-	0	605		304
			IFL:	130		201			631		360
		Ch		130		255			001	1,	000

	FHW.	A-RD-77-108	HIG	HWAY N		REDICT	ION MO	DEL			
Scenario: Year 2 Road Name: Orang Road Segment: e/o E	e Shov		t				t Name: lumber:		ay South		
SITE SPECIFI	C INF	PUT DATA				I	NOISE I	NODE	L INPUT	s	
Highway Data					Site Con	ditions	(Hard =	10, Se	oft = 15)		
Average Daily Traffic (A	dt): 3	0,200 vehicl	es					Autos:	15		
Peak Hour Percenta	qe:	10%			Me	dium Ti	ucks (2)	Axles):	15		
Peak Hour Volur	- ne: 3	3,020 vehicle	s		He	avy Tru	icks (3+)	Axles):	15		
Vehicle Spe	ed:	50 mph		F	Vehicle I	Mix					
Near/Far Lane Distan	ce:	60 feet		-		icleTyp	0	Dav	Evening	Night	Dailv
Site Data					10.11		Autos:	82.9%	•	10.0%	
Barrier Heig	h4.	0.0 feet			Me		rucks:	82.8%		11.7%	
Barrier Type (0-Wall, 1-Ber		0.0			F	leavy 7	rucks:	69.3%			
Centerline Dist. to Barr	·	50.0 feet		-							
Centerline Dist. to Observ		50.0 feet		4	Noise So				eet)		
Barrier Distance to Observ		0.0 feet				Auto		000			
Observer Height (Above Pa		5.0 feet			Mediur			297			
Pad Elevati	·	0.0 feet			Heav	y Truck	(S: 8.	004	Grade Ad	justment	0.0
Road Elevati	on:	0.0 feet			Lane Eq	uivalen	t Distan	ce (in	feet)		
Road Gra	de:	0.0%				Auto	os: 40.	311			
Left Vie	ew:	-90.0 degre	es		Mediur	n Truck	ks: 40.	091			
Right Vie	ew:	90.0 degre	es		Heav	y Truck	(s: 40.	113			
FHWA Noise Model Calcul											
VehicleType REME		Traffic Flow	Di	istance	Finite		Fresi		Barrier At		m Atten
	0.20	2.07		1.3	-	-1.20		-4.65		000	0.00
	1.00	-9.42		1.3		-1.20		-4.87		000	0.00
Heavy Trucks: 8	5.38	-12.53		1.3	3	-1.20		-5.43	0.0	000	0.00
Unmitigated Noise Levels			-		(_						
VehicleType Leq Peal				Leq E	vening	Leq	Night		Ldn		NEL
Autos:	72.4		70.8		66.1		62.8		71.4		71.
Medium Trucks:	71.7		70.1		64.4		62.8		71.0	-	71.
Heavy Trucks:	73.0		70.6		67.6		66.9		73.9		74.
Vehicle Noise:	77.2	-	75.3		71.0		69.4	+	77.	I	77.
Centerline Distance to Noi	se Cor	ntour (in feet	2	70	dBA	65	dBA		60 dBA	55	dBA
			Ldn:		48		319		687		481
			Lun.	1.	10				007		101

	FHW	/A-RD-77-108	HIGHW	AY NO	DISE PRE	DICTION	MODEL			
Road Nam	o: Year 2040 V e: Orange Sho t: e/o Arrowhe	w Rd.	t			roject Nan Job Numb				
SITE S	SPECIFIC IN	PUT DATA				NOIS	E MODE	L INPUT	s	
Highway Data				S	ite Condit	tions (Hai	rd = 10, S	oft = 15)		
Average Daily	Traffic (Adt):	21,300 vehicle	es				Autos	15		
Peak Hour	Percentage:	10%			Mediu	ım Trucks	(2 Axles)	: 15		
Peak H	our Volume:	2,130 vehicle	6		Heavy	y Trucks (3+ Axles)	: 15		
Vel	nicle Speed:	50 mph		V	ehicle Mix	(
Near/Far Lar	e Distance:	60 feet		-	Vehicle	eType	Day	Evening	Night	Daily
Site Data						Autos	s: 82.9%	6 7.1%	10.0%	90.45%
Bar	rier Height:	0.0 feet			Medi	um Truck	s: 82.8%	6 5.6%	11.7%	6.42%
Barrier Type (0-W		0.0			Hea	avy Trucks	s: 69.3%	6 8.7%	22.0%	3.14%
Centerline Dis		50.0 feet			oise Sour	ee Elevie	liono (in i	(a.a.t.)		
Centerline Dist. t	o Observer:	50.0 feet		N				eel)		
Barrier Distance t	o Observer:	0.0 feet			Medium T	Autos:	0.000			
Observer Height ()	Above Pad):	5.0 feet					8.004	Grade Ad	iustmont	
Pa	d Elevation:	0.0 feet			Heavy T	TUCKS:	8.004	Graue Au	usunen	. 0.0
Roa	d Elevation:	0.0 feet		L	ane Equiv	alent Dis	tance (in	feet)		
F	Road Grade:	0.0%				Autos:	40.311			
	Left View:	-90.0 degree	es		Medium T	Trucks:	40.091			
	Right View:	90.0 degree	es		Heavy T	Trucks:	40.113			
FHWA Noise Mode	l Calculations	1								
VehicleType	REMEL	Traffic Flow	Distar	се	Finite Ro	oad F	resnel	Barrier Att	en Ber	m Atten
Autos:	70.20	0.55		1.30		1.20	-4.65		000	0.00
Medium Trucks:	81.00	-10.94		1.34		1.20	-4.87		000	0.00
Heavy Trucks:	85.38	-14.05		1.33	-	1.20	-5.43	0.0	000	0.00
Unmitigated Noise										
,,	Leq Peak Hou			eq Eve		Leq Nigh		Ldn		NEL
Autos:	70.	-	69.3		64.6		61.3	69.8	-	70.
Medium Trucks:	70.		68.6		62.9		61.3	69.5		69.
Heavy Trucks:	71.	•	69.1		66.1		65.3	72.4		72.
Vehicle Noise:	75.	-	73.8		69.5		67.9	75.6	ò	75.
	e to Noise Co	ntour (in feet)							
Centerline Distanc										
Centerline Distanc			L	70 dł		65 dBA		60 dBA		dBA
Centerline Distanc			Ldn: VFL :	70 dł 117 122	,	65 dBA 253 264		545 569	1,	dBA 173 225

	FHW	A-RD-77-108 HIG	HWAY I	NOISE PI	REDICTI		DEL			
	: Year 2040 W : Orange Show : e/o Washing	w Rd.			Project I Job Nu	Vame: 0 Imber: 1		South		
SITE S	PECIFIC INF	PUT DATA			N	OISE N	IODEL	INPUTS	5	
Highway Data				Site Con	ditions (Hard =	10, Soft	= 15)		
Average Daily T	raffic (Adt): 3	4,100 vehicles				A	utos:	15		
Peak Hour P	Percentage:	10%		Me	dium Tru	cks (2 A	xles):	15		
Peak Ho	ur Volume: 3	3,410 vehicles		He	avy Truc	ks (3+ A	xles):	15		
Vehi	icle Speed:	50 mph	ŀ	Vehicle	Mix					
Near/Far Lane	e Distance:	60 feet	ŀ		icleType		Day E	vening	Night	Daily
Site Data				1011			32.9%	7.1%	10.0%	
	ier Heiaht:	0.0 feet		М	edium Tri		32.8%	5.6%	11.7%	6.42%
Barrier Type (0-Wa		0.0 feet			Heavy Tru	ucks: 6	69.3%	8.7%	22.0%	3.14%
Centerline Dist	. ,	50.0 feet								
Centerline Dist. to		50.0 feet	-	Noise So				t)		
Barrier Distance to		0.0 feet			Autos	. 0.0				
Observer Height (A		5.0 feet		Mediu	m Trucks	: 2.2				
0 1	d Elevation:	0.0 feet		Heav	ry Trucks	: 8.0	04 G	rade Adj	ustment.	0.0
	d Elevation:	0.0 feet	ŀ	Lane Eq	uivalent	Distanc	e (in fee	et)		
	oad Grade:	0.0%	ŀ		Autos			/		
	Left View:	-90.0 degrees		Mediu	m Trucks					
1	Right View:	90.0 degrees			ry Trucks					
FHWA Noise Model	Calculations									
VehicleType	REMEL	Traffic Flow D	istance	Finite	Road	Fresne	el Ba	arrier Atte	en Ber	m Atten
Autos:	70.20	2.60	1.3	30	-1.20	-	4.65	0.0	00	0.000
Medium Trucks:	81.00	-8.89	1.3	34	-1.20	-	4.87	0.0	00	0.000
Heavy Trucks:	85.38	-12.01	1.3	33	-1.20	-	5.43	0.0	00	0.000
Unmitigated Noise	Levels (witho	ut Topo and barr	rier atter	nuation)						
VehicleType L	.eq Peak Hour	Leq Day	Leq E	vening	Leq I	light	L	dn		VEL
Autos:	72.9			66.7		63.3		71.9		72.2
Medium Trucks:	72.2			64.9		63.4		71.6		71.8
Heavy Trucks:	73.5			68.1		67.4		74.4		74.7
Vehicle Noise:	77.7	7 75.8		71.5		69.9		77.6		77.9
Centerline Distance	e to Noise Cor	ntour (in feet)								
				dBA	65 a			dBA		dBA
		Ldn:		61	34			45		606
		CNEL:	1	68	36	1	7	78	1,	676

Monday, April 17, 2017

Monday, April 17, 2017

Monday, April 17, 2017

	FHW	/A-RD-77-108	HIGHW	AY NO	OISE PR	EDICTI		DEL			
Scenario: Road Name: Road Segment:	Orange Sho						Name: (Imber: 1		ay South		
SITE SP	ECIFIC IN	PUT DATA				N	OISE N	10DE	L INPUT	s	
Highway Data				S	lite Con	ditions ('Hard =	10, So	oft = 15)		
Average Daily Tra	ffic (Adt):	20,900 vehicle	s					Autos:	15		
Peak Hour Pe	rcentage:	10%			Med	lium Tru	cks (2 A	xles):	15		
Peak Hou	Volume:	2,090 vehicles			Hea	avy Truc	ks (3+ A	xles):	15		
Vehic	le Speed:	50 mph		1	ehicle N	liv					
Near/Far Lane	Distance:	60 feet		V		cleType		Dav	Evening	Night	Daily
Site Data					Vern			82.9%	0	10.0%	
	r Height:	0.0 feet			Me	dium Tri	ucks:	82.8%	5.6%	11.7%	
Barrier Type (0-Wall,		0.0			h	leavv Tru	ucks:	69.3%	8.7%	22.0%	
Centerline Dist.	,	50.0 feet									
Centerline Dist. to		50.0 feet		٨	loise So				et)		
Barrier Distance to		0.0 feet				Autos					
Observer Height (Ab		5.0 feet				n Trucks					
0 1	Elevation:	0.0 feet			Heav	y Trucks	: 8.0	04	Grade Ad	iustmen	t: 0.0
	Elevation:	0.0 feet		L	ane Equ	iivalent	Distand	e (in	feet)		
	ad Grade:	0.0%				Autos			,		
	eft View:	-90.0 degree	s		Mediun	n Trucks	: 40.0)91			
R	ight View:	90.0 degree			Heav	7 Trucks	: 40.1	13			
FHWA Noise Model (Calculations	;									
VehicleType	REMEL	Traffic Flow	Distan	се	Finite	Road	Fresn	el	Barrier Att	en Be	rm Atten
Autos:	70.20	0.47		1.30		-1.20		-4.65	0.0	000	0.00
Medium Trucks:	81.00	-11.02		1.34		-1.20		4.87	0.0	000	0.00
Heavy Trucks:	85.38	-14.13		1.33		-1.20		-5.43	0.0	000	0.00
Unmitigated Noise L											
	q Peak Hou			q Ev	ening	Leq N	· ·		Ldn		NEL
Autos:	70.		9.2		64.5		61.2		69.8	-	70.1
Medium Trucks:	70.		8.5		62.8		61.2		69.4		69.
Heavy Trucks:	71.		9.0		66.0		65.3		72.3		72.6
Vehicle Noise:	75.	6 7	3.7		69.4		67.8		75.5	5	75.8
Centerline Distance	to Noise Co	ntour (in feet)						_			
				70 d		65 a		6	0 dBA		dBA
			.dn:	116	-	25	-		538		,159
		Ch	EL:	12	1	26	1		561	1	,210

	FHW	A-RD-77-108 H	IIGHW.	AY NO	ISE PREDICT		DDEL			
Scenario: Year Road Name: Wasl						t Name: lumber:		ay South		
Road Segment: s/o C	Drange S	Show Rd.								
SITE SPECIF	FIC INP	UT DATA							S	
Highway Data				Si	te Conditions	(Hard	= 10, S	oft = 15)		
Average Daily Traffic (/	Adt):	1,973 vehicles					Autos:	15		
Peak Hour Percent	age:	10%			Medium T	rucks (2	Axles):	15		
Peak Hour Volu	ıme:	197 vehicles			Heavy Tru	icks (3+	Axles):	15		
Vehicle Sp	eed:	25 mph		Ve	hicle Mix					
Near/Far Lane Dista	nce:	12 feet			VehicleTvp	e	Dav	Evening	Night	Dailv
Site Data						Autos:	82.9%	•	v	77.939
Barrier Hei	iaht:	0.0 feet			Medium 1	rucks:	82.8%	5.6%	11.7%	8.579
Barrier Type (0-Wall, 1-Be	•	0.0			Heavy T	rucks:	69.3%	8.7%	22.0%	13.50%
Centerline Dist. to Ba		30.0 feet						41		
Centerline Dist. to Obser	rver:	30.0 feet		NC	oise Source E Auto			eet)		
Barrier Distance to Obser	rver:	0.0 feet			Auto Medium Truci		.000			
Observer Height (Above F	Pad):	5.0 feet					.004	Grade Ad		0.0
Pad Eleva	tion:	0.0 feet			Heavy Truck	is. c	.004	Graue Auj	usunen.	0.0
Road Eleva	tion:	0.0 feet		La	ne Equivaler	t Dista	nce (in	feet)		
Road Gr	ade:	0.0%			Auto	os: 29	.816			
Left V	/iew:	-90.0 degrees	;		Medium Truci		.518			
Right V	/iew:	90.0 degrees	;		Heavy Truck	(S: 29	0.547			
FHWA Noise Model Calcu	lations									
VehicleType REM		Traffic Flow	Distar		Finite Road	Fres		Barrier Att		m Atten
	58.73	-7.42		3.26	-1.20		-4.49	0.0		0.00
	70.80	-17.00		3.33	-1.20		-4.86	0.0		0.00
Heavy Trucks:	77.97	-15.03		3.32	-1.20		-5.77	0.0	00	0.00
Unmitigated Noise Levels	(withou	ut Topo and b	arrier a	attenua	ation)					
	ak Hour			eq Eve		Night		Ldn		VEL
Autos:	53.4		1.8		47.1	43		52.4		52.
Medium Trucks:	55.9	-	4.3		48.6	47		55.2		55.
Heavy Trucks:	65.1		2.7		59.7	58	-	66.0		66.
Vehicle Noise:	65.8		3.6		60.2	59	.3	66.5		66.
Centerline Distance to No	oise Cor	ntour (in feet)	-	70 .0		-10.4	- I	00 -10 4		-10.4
		,	dn:	70 dB		dBA 38		60 dBA 82		dBA 76
				18		38 39		82 85		76 83
	CNEL:							00		05

	FH	WA-RD-77-10	BHIG	HWAY I	NOISE PF	REDICT	ION M	ODEL			
	: Waterman							Gatew 10189	ay South		
SITE S	PECIFIC IN	NPUT DATA				I	IOISE	MODE	L INPUT	s	
Highway Data					Site Con	ditions	(Hard	= 10, So	oft = 15)		
Average Daily T	raffic (Adt):	32,610 vehic	les					Autos:	15		
Peak Hour P	ercentage:	10%			Me	dium Tr	ucks (2	Axles):	15		
Peak Ho	ur Volume:	3,261 vehicle	es		He	avy Tru	cks (3+	Axles):	15		
Vehi	cle Speed:	50 mph		ŀ	Vehicle I	Mix					
Near/Far Lane	e Distance:	60 feet		-		cleType	,	Day	Evening	Night	Daily
Site Data						,	Autos:	82.9%	7.1%	10.0%	90.589
Barr	ier Height:	0.0 feet			Me	dium T	rucks:	82.8%	5.6%	11.7%	6.289
Barrier Type (0-Wa		0.0			ŀ	leavy T	rucks:	69.3%	8.7%	22.0%	3.14
Centerline Dist.		50.0 feet		ľ	Noise Sc	ource E	levatio	ns (in fe	eet)		
Centerline Dist. to		50.0 feet		ľ		Auto	s: (0.000	1		
Barrier Distance to		0.0 feet			Mediur	n Truck	s: 2	2.297			
Observer Height (A	,	5.0 feet				y Truck		3.004	Grade Ad	justment	: 0.0
	Elevation:	0.0 feet		-		,					
	Elevation:	0.0 feet		-	Lane Eq				teet)		
R	oad Grade:	0.0%				Auto n Truck).311			
,	Left View: Right View:	-90.0 degre 90.0 degre				п тrucк у Truck).091).113			
	•	0	.03			,					
FHWA Noise Model	Calculation REMEL	IS Traffic Flow	Di	stance	Finite	Dood	Fres	nol	Barrier Att	an Ba	m Atter
VehicleType Autos:	70.20			1.3		-1.20	Fies	-4.65		200	0.00
Medium Trucks:	81.00			1.3	-	-1.20		-4.87		000	0.00
Heavy Trucks:	85.38			1.3		-1.20		-4.07		000	0.00
Unmitigated Noise	Levels (with	out Topo and	l barri	er attei	nuation)						
VehicleType L	eq Peak Ho	ur Leq Da	y	Leq E	vening	Leq	Night		Ldn	C	NEL
Autos:	72	2.7	71.1		66.5		63	.2	71.	7	72
Medium Trucks:	72	2.0	70.3		64.6		63	.1	71.3	3	71
Heavy Trucks:	73	3.3	70.9		67.9		67	.2	74.:	3	74
Vehicle Noise:	77	7.5	75.6		71.3		69	.7	77.	4	77
Centerline Distance	to Noise C	ontour (in fee	t)								
			T		dBA		dBA	6	60 dBA		dBA
Ldn:					155 335 721 1,5			554			
	CNEL:						162 350 753 1,62				

	FHW	A-RD-77-108 HI	GHWAY	NOISE PI	REDICT	ION MOI	DEL			
	Year 2040 W Waterman A s/o Dumas S	v. ,				Name: (lumber: 1		ay South		
SITE SF	PECIFIC INF	PUT DATA			ľ	NOISE N	IODE		S	
Highway Data				Site Con	ditions	(Hard =	10, So	ft = 15)		
Average Daily Tra	affic (Adt): 3	4,610 vehicles					Autos:	15		
Peak Hour Pe	ercentage:	10%		Me	dium Tr	ucks (2 A	xles):	15		
Peak Hou	ir Volume: 3	3,461 vehicles		He	avy Tru	cks (3+ A	xles):	15		
Vehic	cle Speed:	50 mph		Vehicle	Mix					
Near/Far Lane	Distance:	60 feet			icleType		Day	Evening	Night	Daily
Site Data							32.9%	7.1%	10.0%	
Barrie	er Heiaht:	0.0 feet		M	edium T	rucks:	82.8%	5.6%	11.7%	6.29%
Barrier Type (0-Wall		0.0		1	Heavy T	rucks:	69.3%	8.7%	22.0%	3.14%
Centerline Dist.	. ,	50.0 feet		Noise So	ourco E	lovation	(in fo	(of)		
Centerline Dist. to	Observer:	50.0 feet		NUISE SC	Auto			ei)		
Barrier Distance to	Observer:	0.0 feet		Modiu	m Truck	0.0				
Observer Height (At	oove Pad):	5.0 feet			v Truck			Grade Ad	iustment	.00
Pad	Elevation:	0.0 feet								
Road	Elevation:	0.0 feet		Lane Eq				eet)		
	ad Grade:	0.0%			Auto					
	Left View:	-90.0 degrees			m Truck					
R	Right View:	90.0 degrees		Heav	ry Truck	's: 40.1	13			
FHWA Noise Model	Calculations									
VehicleType	REMEL	Traffic Flow	Distance	Finite	Road	Fresn	el i	Barrier Att	en Ber	m Atten
Autos:	70.20	2.67	1.	30	-1.20		4.65	0.0	000	0.000
Medium Trucks:	81.00	-8.92	1.	34	-1.20		4.87	0.0	000	0.000
Heavy Trucks:	85.38	-11.93	1.	33	-1.20		-5.43	0.0	000	0.000
Unmitigated Noise L	evels (witho	ut Topo and ba	rrier atte	nuation)						
VehicleType Le	eq Peak Hour	Leq Day	Leq	Evening	Leq	Night		Ldn	-	NEL
Autos:	73.0	71	.4	66.7		63.4		72.0)	72.3
Medium Trucks:	72.2			64.9		63.3		71.5		71.8
Heavy Trucks:	73.6	5 71	.2	68.2		67.5		74.5	5	74.8
Vehicle Noise:	77.7	7 75	.8	71.6		70.0		77.6	6	77.9
Centerline Distance	to Noise Cor	ntour (in feet)								
) dBA		dBA	6	0 dBA		dBA
		Ld		162		48		751		617
		CNE	L: '	169	3	64		784	1,	689

Monday, April 17, 2017

Monday, April 17, 2017

138

	FHV	VA-RD-77-108	HIGHWA	AY NC	DISE PR	EDICTIO	N MOI	DEL				
	: Year 2040 : Waterman : s/o Park Ce	Av.		Project Name: Gateway South Job Number: 10189								
SITE S	PECIFIC IN	PUT DATA				NO	ISE N	IODE	L INPUT	s		
Highway Data				Si	te Con	ditions (H	ard =	10, Sc	ft = 15)			
Average Daily T	raffic (Adt):	42,308 vehicle	es				F	Autos:	15			
Peak Hour P	. ,	10%			Med	lium Truck	ks (2 A	xles):	15			
Peak Ho	ur Volume:	4,231 vehicles	6		Hea	avy Trucks	s (3+ A	xles):	15			
Veh	icle Speed:	50 mph		16	ehicle N							
Near/Far Lan	e Distance:	60 feet		Ve		cleType	- 1	Dav	Evening	Night	Dailv	
Site Data					Vern	Aut		32.9%	7.1%	10.0%		
				-	Me	dium Truc		32.8%		11.7%		
	ier Height:	0.0 feet				leavy Truc		59.3%		22.0%		
Barrier Type (0-Wa Centerline Dist	. ,	50.0 feet										
Centerline Dist. to		50.0 feet		N	oise So	urce Elev			et)			
Barrier Distance to		0.0 feet				Autos:	0.0					
Observer Height (A		5.0 feet				n Trucks:	2.2					
0 (d Flevation:	0.0 feet			Heav	v Trucks:	8.0	04	Grade Ad	justment	: 0.0	
Road	d Elevation:	0.0 feet		Lá	ane Equ	ivalent D	istanc	e (in i	eet)			
R	oad Grade:	0.0%				Autos:	40.3	311	-			
	Left View:	-90.0 degree	es		Mediun	n Trucks:	40.0	91				
	Right View:	90.0 degree	es		Heav	Y Trucks:	40.1	13				
FHWA Noise Model	Calculation	s										
VehicleType	REMEL	Traffic Flow	Distan		Finite		Fresn		Barrier Att		rm Atten	
Autos:	70.20	3.50		1.30		-1.20		4.65		000	0.00	
Medium Trucks:	81.00	-7.90		1.34		-1.20		4.87		000	0.00	
Heavy Trucks:	85.38	-10.26		1.33		-1.20		-5.43	0.0	000	0.00	
Unmitigated Noise					- í.							
VehicleType L Autos:	eq Peak Hou. 73	1.7	72.2	q Eve	67.6	Leq Ni	64.2		Ldn 72.8		NEL 73.	
Autos: Medium Trucks:	73		72.2 71.6		65.9		64.4		72.6		73.	
Heavy Trucks:	75	-	72.9		69.9		69.1		72.0	-	76.	
Vehicle Noise:	73	-	77.0		72.9		71.3		70.2	-	70.	
Centerline Distance	e to Noise Co	ontour (in feet)									
				70 dE	BA	65 dB	A	6	0 dBA	55	dBA	
			Ldn:	198		426			917	1.	976	

FI	HWA-RD-77-	108 HIG	HWAY N	NOISE PR	EDICTI		DEL				
Scenario: Year 204		ct		Project Name: Gateway South							
Road Name: Waterma	n Av.				Job NL	imber:	10189				
Road Segment: n/o Hosp	tality Ln.										
SITE SPECIFIC	INPUT DA	ГА						L INPUT	s		
Highway Data				Site Cond	ditions (Hard =	10, So	oft = 15)			
Average Daily Traffic (Adt):	36,408 ve	hicles				,	Autos:	15			
Peak Hour Percentage:	10%			Med	lium Tru	cks (2 A	(xles):	15			
Peak Hour Volume:	3,641 veh	nicles		Hea	avy Truc	ks (3+ A	(xles):	15			
Vehicle Speed:	50 mp	h	-	Vehicle N	lix						
Near/Far Lane Distance:	60 fee	t			cleType		Dav	Evening	Night	Dailv	
Site Data					A	utos:	82.9%	7.1%	10.0%	89.60%	
Barrier Height:	0.0 fe	et		Me	dium Tru	ucks:	82.8%	5.6%	11.7%	6.52%	
Barrier Type (0-Wall, 1-Berm):				н	leavy Tri	ucks:	69.3%	8.7%	22.0%	3.889	
Centerline Dist. to Barrier:		et	-	Noise So							
Centerline Dist. to Observer:	50.0 fe	et	-	Noise So				eet)			
Barrier Distance to Observer:	0.0 fe	et		1.4 × 16 × 10	Autos 1 Trucks		000 297				
Observer Height (Above Pad):	5.0 fe	et			/ Trucks		297 004	Grade Ad	iustmont	0.0	
Pad Elevation:	0.0 fe	et		neavj	/ ITUCKS	. 0.0	JU4	Graue Au	usuneni.	0.0	
Road Elevation:	0.0 fe	et		Lane Equ	iivalent	Distand	ce (in i	feet)			
Road Grade:	0.0%				Autos	: 40.3	311				
Left View:	-90.0 de	grees			n Trucks						
Right View:	90.0 de	grees		Heavy	/ Trucks	: 40.	113				
FHWA Noise Model Calculation	ons										
VehicleType REMEL	Traffic Flo	ow D	Distance	Finite I	Road	Fresn	el	Barrier Att	en Ber	m Atten	
Autos: 70.2		2.84	1.3	-	-1.20		-4.65		000	0.00	
Medium Trucks: 81.0		3.54	1.3		-1.20		-4.87		000	0.00	
Heavy Trucks: 85.3	8 -10	0.80	1.3	3	-1.20		-5.43	0.0	000	0.00	
Unmitigated Noise Levels (wi			1	,					1		
VehicleType Leq Peak H		Day		vening	Leq N	<u> </u>		Ldn		VEL	
	73.1	71.5		66.9		63.6		72.1		72.	
	2.6	71.0		65.3		63.7		71.9		72.	
	4.7	72.3		69.3		68.6		75.7		75.	
	78.4	76.4	•	72.3		70.7		78.4	1	78.	
Centerline Distance to Noise	Contour (in	feet)	70	dD A	65 -	ID A		C dBA	57	dD A	
		Ldn.		dBA 80	65 a 38		e	60 dBA 838		dBA 805	
		Lan.	. 10	00		3		030	1,0	000	

FHWA-RD-77-	108 HIGHWAY NOISE PREDICTION MODEL
Scenario: Year 2040 With Projec Road Name: Waterman Av. Road Segment: s/o Hospitality Ln.	ct Project Name: Gateway South Job Number: 10189
SITE SPECIFIC INPUT DAT	A NOISE MODEL INPUTS
hway Data	Site Conditions (Hard = 10, Soft = 15)
Average Daily Traffic (Adt): 55,228 ve	hicles Autos: 15
B 1 11 B 1 1001	
Peak Hour Percentage: 10%	Medium Trucks (2 Axles): 15
Peak Hour Percentage: 10% Peak Hour Volume: 5,523 veh	
Peak Hour Volume: 5,523 veh Vehicle Speed: 50 mp	icles Heavy Trucks (3+ Axles): 15 h Vehicle Mix
Peak Hour Volume: 5,523 veh	icles Heavy Trucks (3+ Axles): 15 h Vehicle Mix

Highway Data			_		Site Con	ditions	(Hard	= 10, So	oft = 15)	_	_
Average Daily	Traffic (Adt):	55,228 vehicle	s					Autos:	15		
Peak Hour	Percentage:	10%			Me	dium Tr	ucks (2	Axles):	15		
Peak H	lour Volume:	5,523 vehicles			He	avy Tru	cks (3+	Axles):	15		
Ve	hicle Speed:	50 mph			Vehicle I	Niv					
Near/Far La	ne Distance:	60 feet		H		cleType	<u> </u>	Day	Evening	Night	Daily
Site Data				+	10/1		Autos:	82.9%	0	10.0%	,
Pa	rrier Heiaht:	0.0 feet			Me	edium T	rucks:	82.8%	5.6%	11.7%	
Barrier Type (0-V		0.0			F	łeavy T	rucks:	69.3%	8.7%	22.0%	3.49%
<i>,</i> , , , , , , , , , , , , , , , , , , ,	ist. to Barrier:	50.0 feet		H							
Centerline Dist.	to Observer:	50.0 feet		4	Noise So				eet)		
Barrier Distance		0.0 feet				Auto		0.000			
Observer Height	(Above Pad):	5.0 feet				n Truck		.297	0		
	ad Elevation:	0.0 feet			Heav	y Truck	:s: 8	.004	Grade Ad	ustment	: 0.0
Ro	ad Elevation:	0.0 feet		1	Lane Eq	uivalen	t Distai	nce (in	feet)		
	Road Grade:	0.0%				Auto	s: 40).311			
	Left View:	-90.0 degree	s		Mediur	n Truck	s: 40	0.091			
	Right View:	90.0 degree	s		Heav	y Truck	:s: 40).113			
FHWA Noise Mod	lel Calculation	-									
VehicleType	REMEL	Traffic Flow	Distan	се	Finite		Fres	inel	Barrier Att	en Ber	rm Atten
Autos:		4.67		1.30	-	-1.20		-4.65	0.0	000	0.000
Medium Trucks:		-6.77		1.34		-1.20		-4.87	0.0	000	0.000
Heavy Trucks:	85.38	-9.44		1.3	3	-1.20		-5.43	0.0	000	0.000
Unmitigated Nois	e Levels (with	out Topo and L	oarrier a	tten	uation)						
VehicleType	Leq Peak Hou			q E	vening	Leq	Night		Ldn		NEL
Autos:	75		3.4		68.7		65		74.0		74.3
Medium Trucks:			2.8		67.1		65		73.7		73.9
Heavy Trucks:	76	.1 7	3.7		70.7		69	.9	77.0)	77.3
Vehicle Noise:	80	.0 7	8.1		73.8		72	.3	79.9)	80.2
Centerline Distan	ce to Noise Co	ontour (in feet)									
				70 d	dBA	65	dBA	6	60 dBA	55	dBA
		L	.dn:	23	30	4	95		1,066	2,	296
		CN	IEL:	24	40	5	16		1,112	2,	396

	FH	WA-RD-77-108	HIGH	IWAY NO	OISE PI	REDICTI		DEL				
Road Nam	io: Year 2040 ne: Auto Cente nt: e/o I-215 F	er Rd.			Project Name: Gateway South Job Number: 10189							
SITE	SPECIFIC I	NPUT DATA							INPUT	s		
Highway Data				s	ite Cor	nditions ('Hard =	10, Sof	t = 15)			
Average Daily	Traffic (Adt):	39,905 vehicl	es				A	Autos:	15			
Peak Hour	Percentage:	10%			Me	dium Tru	cks (2 A	xles):	15			
Peak H	lour Volume:	3,991 vehicle	s		He	avy Truc	ks (3+ A	xles):	15			
Ve	hicle Speed:	40 mph		v	ehicle	Mix						
Near/Far La	ne Distance:	60 feet		-		icleType		Day I	Evening	Night	Daily	
Site Data						A	utos:	32.9%	7.1%	10.0%	89.87%	
Ba	rrier Height:	0.0 feet			М	edium Tri	ucks:	82.8%	5.6%	11.7%	6.46%	
Barrier Type (0-W		0.0			1	Heavy Tri	ucks: (69.3%	8.7%	22.0%	3.67%	
Centerline Di	st. to Barrier:	50.0 feet		N	loise S	ource Ele	evations	; (in fee	t)			
Centerline Dist.	to Observer:	50.0 feet				Autos		•	/			
Barrier Distance	to Observer:	0.0 feet			Mediu	m Trucks						
Observer Height (,	5.0 feet				/y Trucks			Grade Adj	iustment	0.0	
	ad Elevation:	0.0 feet				·						
	ad Elevation:	0.0 feet		L	ane Eq	uivalent			et)			
1	Road Grade:	0.0%				Autos						
	Left View:	-90.0 degre	es			m Trucks						
	Right View:	90.0 degre	es		Heav	/y Trucks	: 40.1	13				
FHWA Noise Mod	el Calculation	ıs		-								
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite	Road	Fresn	el B	arrier Atte	en Ber	m Atten	
Autos:	66.51	4.22		1.30		-1.20		4.65	0.0	000	0.000	
Medium Trucks:	77.72	-7.21		1.34		-1.20		4.87	0.0	000	0.000	
Heavy Trucks:	82.99	-9.67		1.33		-1.20		-5.43	0.0	000	0.000	
Unmitigated Noise	e Levels (with			er attenu	lation)							
VehicleType	Leq Peak Ho			Leq Ev		Leq I	·	L	dn		VEL	
Autos:		0.8	69.2		64.6		61.3		69.8		70.2	
Medium Trucks:		0.6	69.0		63.3		61.8		70.0		70.2	
Heavy Trucks:		3.5	71.1		68.1		67.3		74.4		74.7	
Vehicle Noise:	76	6.6	74.6		70.6		69.2		76.7	,	77.0	
Centerline Distant	ce to Noise C	ontour (in fee	t)									
				70 di		65 a			dBA		dBA	
			Ldn:	140	-	30	-		651		403	
		С	NEL:	146	6	31	5	e	679	1,	463	

Monday, April 17, 2017

Monday, April 17, 2017

Monday, April 17, 2017

	FH\	WA-RD-77-108	HIGHV	VAY NO	DISE PR	EDICTIO	N MOE	DEL					
	o: Year 2040 e: Orange Sh tt: e/o E St.				Project Name: Gateway South Job Number: 10189								
SITE S	SPECIFIC IN	IPUT DATA				NO	ISE M	IODE	L INPUT	s			
Highway Data				S	ite Cond	ditions (H	ard =	10, So	oft = 15)				
Average Daily	Traffic (Adt):	31.061 vehicle	s				A	utos:	15				
Peak Hour	Percentage:	10%			Med	lium Truck	(2 A	xles):	15				
Peak H	our Volume:	3,106 vehicles	6		Hea	vy Trucks	; (3+ A	xles):	15				
Vel	nicle Speed:	50 mph		V	ehicle N	liv.							
Near/Far Lar	ne Distance:	60 feet		V		cleType		Dav	Evening	Night	Dailv		
Site Data					venik	Aut		32.9%	0	10.0%			
	ula u Haladada	0.0 feet			Me	dium Truc		32.8%		11.7%			
Barrier Type (0-W	rier Height:	0.0 feet			Н	eavy Truc		39.3%		22.0%			
Centerline Dis		50.0 feet											
Centerline Dist.		50.0 feet		N	oise So	urce Elev			et)				
Barrier Distance t		0.0 feet				Autos:	0.0						
Observer Height ()		5.0 feet				n Trucks:	2.2						
0 1	d Flevation:	0.0 feet			Heavy	/ Trucks:	8.0	04	Grade Ad	iustment	: 0.0		
	d Elevation:	0.0 feet		L	ane Eau	ivalent D	istanc	e (in f	feet)				
	Road Grade:	0.0%				Autos:	40.3		,				
	Left View:	-90.0 degree	s		Mediun	1 Trucks:	40.0	91					
	Right View:	90.0 degree			Heavy	/ Trucks:	40.1	13					
FHWA Noise Mode	el Calculation	IS											
VehicleType	REMEL	Traffic Flow	Dista	ance	Finite I	Road	Fresne	el i	Barrier Att	en Bei	rm Atten		
Autos:	70.20	2.16		1.30		-1.20	-	4.65	0.0	000	0.00		
Medium Trucks:	81.00	-9.27		1.34		-1.20		4.87		000	0.00		
Heavy Trucks:	85.38	-11.56		1.33		-1.20	-	5.43	0.0	000	0.00		
Unmitigated Noise													
	Leq Peak Ho			Leq Eve		Leq Ni	,		Ldn		NEL		
Autos:	72		70.9		66.2		62.9		71.4		71.		
Medium Trucks:	71		70.3		64.5		63.0		71.2	-	71.		
Heavy Trucks:	74		71.6		68.6		67.8		74.9	·	75.		
Vehicle Noise:	77		75.7		71.5		70.0		77.6	6	77.		
Centerline Distanc	e to Noise C	ontour (in feet)	70 dł	RA	65 dB	A	6	0 dBA	55	dBA		
			I dn:	161		347		0	748		612		
			VFI :	168		363			781		683		
		Ci	•	100		505				1,	000		

	FHW	A-RD-77-108	HIG	HWAY I	NOISE PF	REDICT	TION MO	DEL				
Scenario: Year 2	040 W	/ith Project			Project Name: Gateway South							
Road Name: Orang	e Shov	w Rd.				Job I	lumber:	10189				
Road Segment: e/o Ar	rowhea	ad Av.										
SITE SPECIFI	C INP	UT DATA							L INPUT	s		
Highway Data					Site Con	ditions	; (Hard =	10, Se	oft = 15)			
Average Daily Traffic (A	dt): 2	2,183 vehicle	es					Autos:	15			
Peak Hour Percenta	ge:	10%			Me	dium T	rucks (2 /	Axles):	15			
Peak Hour Volur	ne: 2	2,218 vehicles	s		He	avy Tru	icks (3+ /	Axles):	15			
Vehicle Spe		50 mph		ŀ	Vehicle I	Mix						
Near/Far Lane Distan	ce:	60 feet		ŀ		icleTyp	e	Day	Evening	Night	Daily	
Site Data							Autos:	82.9%	7.1%	10.0%		
Barrier Heig	ht.	0.0 feet			Me	edium T	rucks:	82.8%	5.6%	11.7%	6.479	
Barrier Type (0-Wall, 1-Ber		0.0			ŀ	leavy T	rucks:	69.3%	8.7%	22.0%	4.099	
Centerline Dist. to Barr	·	50.0 feet		-								
Centerline Dist. to Observ		50.0 feet		-	Noise Sc				eet)			
Barrier Distance to Observ		0.0 feet				Auto		000				
Observer Height (Above Pa	d):	5.0 feet			Mediur			297	Grade Ad	iustroopt		
Pad Elevati	on:	0.0 feet			Heav	y Trucl	(S: 8.)	004	Grade Adj	usunen.	0.0	
Road Elevati	on:	0.0 feet			Lane Eq	uivaler	t Distan	ce (in	feet)			
Road Gra	de:	0.0%		ſ		Auto	os: 40.	311				
Left Vie	ew:	-90.0 degree	es		Mediur	m Trucl	(s: 40.	091				
Right Vie	ew:	90.0 degree	es		Heav	y Trucl	(s: 40.	113				
FHWA Noise Model Calcul	ations			1								
VehicleType REME		Traffic Flow	Di	istance	Finite	Road	Fresr	nel	Barrier Att	en Ber	m Atten	
	0.20	0.68		1.3		-1.20		-4.65		000	0.00	
	1.00	-10.73		1.3		-1.20		-4.87		000	0.00	
Heavy Trucks: 8	5.38	-12.72		1.3	3	-1.20		-5.43	0.0	000	0.00	
Unmitigated Noise Levels			barri		í ,							
VehicleType Leq Pear				Leq E	vening	Leq	Night		Ldn		VEL	
Autos:	71.0		69.4		64.7		61.4		70.0		70.	
Medium Trucks:	70.4		68.8		63.1		61.5		69.7		70.	
Heavy Trucks:	72.8		70.4		67.4		66.7		73.7		74	
Vehicle Noise:	76.3		74.4		70.2		68.7	7	76.3	3	76	
Centerline Distance to Noi	se Cor	ntour (in feet)									
			. , l		dBA		dBA	6	60 dBA		dBA	
			Ldn:		32		284		613		320	
			NFI :	1	38		297		639	1:	378	

	FH	WA-RD-77-108	HIGH	NAY N	OISE PR	EDICTI	ON MC	DEL					
	o: Year 2040 e: Orange Sh t: e/o Washi	iow Rd.			Project Name: Gateway South Job Number: 10189								
SITE S	SPECIFIC I	NPUT DATA				N	DISE	MODE	l input	s			
Highway Data				5	Site Con	ditions (Hard =	= 10, Sc	oft = 15)				
Average Daily	Fraffic (Adt):	34,711 vehicl	es					Autos:	15				
Peak Hour I	Percentage:	10%			Med	dium Tru	cks (2	Axles):	15				
Peak Ho	our Volume:	3,471 vehicle	s		Hea	avy Truc	ks (3+	Axles):	15				
Vel	nicle Speed:	50 mph		1	/ehicle I	<i>lix</i>							
Near/Far Lar	e Distance:	60 feet			Vehi	cleType		Day	Evening	Night	Daily		
Site Data						A	utos:	82.9%	7.1%	10.0%	90.519		
Ran	rier Height:	0.0 feet			Me	dium Tru	icks:	82.8%	5.6%	11.7%	6.339		
Barrier Type (0-Wa		0.0			H	leavy Tru	icks:	69.3%	8.7%	22.0%	3.169		
Centerline Dis	t. to Barrier:	50.0 feet			Voise So	urce Ele	vatio	ns (in fe	pet)				
Centerline Dist. t	o Observer:	50.0 feet		-		Autos		.000	,01)				
Barrier Distance t	o Observer:	0.0 feet			Modiur	n Trucks	-	.000					
Observer Height (/	Above Pad):	5.0 feet				v Trucks		.004	Grade Ad	iustment	0.0		
Pa	d Elevation:	0.0 feet			neav	y mucho	. 0.	.004					
	d Elevation:	0.0 feet		L	ane Equ				feet)				
F	Road Grade:	0.0%				Autos		.311					
	Left View:	-90.0 degre	es			n Trucks		.091					
	Right View:	90.0 degre	es		Heav	y Trucks	40	.113					
FHWA Noise Mode	l Calculation	ıs											
VehicleType	REMEL	Traffic Flow	Dist	ance	Finite		Fres		Barrier Att		m Atten		
Autos:	70.20			1.30		-1.20		-4.65		000	0.00		
Medium Trucks:	81.00			1.34		-1.20		-4.87		000	0.00		
Heavy Trucks:	85.38			1.33		-1.20		-5.43	0.0	000	0.00		
Unmitigated Noise								-					
11	Leq Peak Ho			Leq Ev	~	Leq N			Ldn		NEL		
Autos:		3.0	71.4		66.7		63.		72.0		72		
Medium Trucks:		2.3 3.6	70.6 71.2		64.9 68.2		63. 67.		71.6 74.6		71. 74		
Heavy Trucks: Vehicle Noise:		3.6 7.8	75.9		71.6		70.	-	74.0		74.		
Centerline Distanc					71.0		70.	0			70.		
	e to Noise C	ontour (in feel	/	70 a	ID A	65.0	DA	6	0 dBA	55	dBA		
oomonino piotano				70 0	IDA	00 0							
			Ldn:	16		35			754		625		

Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Barrier Distance to Deserver: 50.0 feet Barrier Distance to Observer: 0.0 feet Road Elevation: 0.0 degrees Right View: 90.0 degrees VehicleType REMEL Traffic Flow VehicleType REMEL Traffic Flow VehicleType RelMet Traffic Flow VehicleType Leq Day 1.30 -1.20 Motes 1.31 1.33 -1.20 Medium Trucks: 85.38 -14.13 1.33		FH	WA-RD-77-108	B HIGH	NAY NO	OISE P	REDICTIC		DEL					
Site Conditions (Hard = 10, Soft = 15) Average Daily Traffic (Adt): 21,066 vehicles Peak Hour Percentage: 10% Peak Hour Volume: 2,107 vehicles Vehicle Speed: 50 mph Near/Far Lane Distance: 60 feet Barrier Height: 0.0 feet Barrier Type (0-Walt, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Barrier Distance to Observer: 50.0 feet Barrier Weight (Above Pad): 5.0 feet Barrier Weight (Above Pad): 5.0 feet Barrier Distance to Observer: 50.0 feet Barrier Weight (Above Pad): 5.0 feet Road Grade: 0.0% Left View: 9.0.0 degrees Right View: 9.0.0 degrees Right View: 9.0.0 degrees Right View: 1.30 -1.20 -4.65 0.000 Medium Trucks: 8.1.00 -1.1.02 -4.65 0.000 0.00 Heavy Trucks: 8.1.00 -1.1.2 -3.4 -2.0 -4.65 0.000 0.00 <th>Road Nan</th> <th>ne: Orange Sh</th> <th>iow Rd.</th> <th></th> <th></th> <th colspan="9"></th>	Road Nan	ne: Orange Sh	iow Rd.											
Site Conditions (Hard = 10, Soft = 15) Average Daily Traffic (Adt): 21,066 vehicles Peak Hour Porcentage: 10% Peak Hour Porcentage: 10% Near/Far Lane Distance: 60 feet Site Data Autos: 15 Vehicle Speed: 50 mph Near/Far Lane Distance: 60 feet Vehicle Type Day Evening Night Daily Site Data Autos: 82.9% 7.1% 10.0% 90.52* Barrier Height: 0.0 feet Medium Trucks: 82.9% 7.1% 10.0% 90.52* Barrier Type (0-Walt, 1-Berm): 0.0 feet Autos: 2.93% 8.7% 22.0% 3.11* Centerline Dist. to Bserver: 5.0 feet Autos: 0.000 Medium Trucks: 8.004 Grade Adjustment: 0.0 Barrier Wield (Above Pad): 5.0 feet Autos: 0.000 Medium Trucks: 8.004 Grade Adjustment: 0.0 Heavy Trucks: 8.004 Grade Adjustment: 0.0 Medium Trucks:	SITE	SPECIFIC I	VPUT DATA				NC	DISE N	IODE		s			
Note Medium Trucks (2 Axles): 15 Peak Hour Volume: 2,107 vehicles Heavy Trucks (3+ Axles): 15 Vehicle Speed: 50 mph Vehicle Mix 15 Neat/Far Lane Distance: 60 feet Vehicle Mix Vehicle Mix Site Data Autos: 82.9% 7.1% 10.0% 90.52? Barrier Height: 0.0 feet Medium Trucks: 82.8% 5.5% 11.7% 6.37% Barrier Dist. to Diserver: 50.0 feet Medium Trucks: 82.8% 5.5% 11.7% 6.37% Barrier Dist. to Diserver: 50.0 feet Medium Trucks: 82.8% 5.0% 11.7% 6.37% Centerline Dist. to Diserver: 50.0 feet Mutos: 0.000 Medium Trucks: 82.9% 7.1% 10.0% 90.37% Observer Height (Above Pad): 5.0 feet Mutos: 0.000 Medium Trucks: 8.004 Grade Adjustment: 0.0 Road Grade: 0.0 feet Lane Equivalent Distance (in feet) Medium Trucks: 40.091 Heavy Trucks: 40.001 <th></th> <th></th> <th></th> <th></th> <th>S</th> <th>ite Cor</th> <th></th> <th></th> <th></th> <th></th> <th>-</th> <th></th>					S	ite Cor					-			
Peak Hour Volume: 2,107 vehicles Vehicle Speed: 50 mph Near/Far Lane Distance: 60 feet Vehicle Type Day Evening Night Daily Site Data Autos: 82.9% 7.1% 10.0% 90.52* Barrier Height: 0.0 feet Medium Trucks: 82.9% 7.1% 10.0% 90.52* Barrier Type (0-Wall, 1-Berm): 0.0 feet Medium Trucks: 82.9% 5.6% 11.7% 6.37* Barrier Type (0-Wall, 1-Berm): 0.0 feet Moise Source Elevations (in feet) Autos: 0.000 Centerline Dist. to Barrier: 50.0 feet Multos: 0.000 Medium Trucks: 2.297 Observer Height (Above Pad): 5.0 feet Multos: 0.000 Medium Trucks: 8.004 Grade Adjustment: 0.0 Road Elevation: 0.0 feet Moise Source Elevations (in feet) Autos: 0.000 Medium Trucks: 8.004 Grade Adjustment: 0.0 Heavy Trucks: 8.004 Grade Adjustment: 0.0 Eare E	Average Daily	Traffic (Adt):	21,066 vehicl	es										
Vehicle Speed: Near/Far Lane Distance: 50 mph 60 feet Vehicle Mx Site Data Autos: 82.9% 7.1% 10.0% 90.52' Barrier Height: 0.0 feet Autos: 82.9% 7.1% 10.0% 90.52' Barrier Type (0-Wall, 1-Berm): 0.0 feet Medium Trucks: 82.8% 5.6% 11.7% 6.37' Barrier Distance to Observer: 0.0 feet Medium Trucks: 22.97 7.5.0 10.0% 9.52' Barrier Distance to Observer: 0.0 feet Autos: 0.000 Medium Trucks: 2.2.97 Observer Height (Nove Pad): 5.0 feet Autos: 0.000 Medium Trucks: 2.97 Pad Elevation: 0.0 feet Autos: 40.311 Medium Trucks: 40.91 Road Grade: 0.0% Autos: 40.311 Medium Trucks: 40.91 Heavy Trucks: 81.00 -11.02 1.30 -1.20 -4.65 0.000 0.000 Medium Trucks: 85.38 -14.13 1.33 -1.20 -4.65 0.0	Peak Hour	Percentage:	10%											
Near/Far Lane Distance: 60 feet Vehicle Mix Vehicle Type Day Evening Night Daily Site Data Autos: 82.9% 7.1% 10.0% 90.52 Barrier Height: 0.0 feet Medium Trucks: 82.8% 5.6% 11.7% 6.37* Barrier Height: 0.0 feet Medium Trucks: 82.8% 5.0% 11.7% 6.37* Centerline Dist. to Diserver: 50.0 feet Moles Source Elevations (in feet) 7.4% 0.00 3.11* Observer Height (Above Pad): 5.0 feet Autos: 0.000 Medium Trucks: 8.004 Grade Adjustment: 0.0 Road Elevation: 0.0 feet Lane Equivalent Distance (in feet) 0.0 4.005* 0.000 Medium Trucks: 40.091 Right View: 90.0 degrees Finite Road Fresnel Barrier Atten Berrier Atten Methedium Trucks: 40.000 0.000 Medium Trucks: 81.00 -11.02 1.34 -1.20 -4.65 0.000 0.000	Peak H	lour Volume:	2,107 vehicle	S		He	avy Truck	(3+ A	xles):	15				
Notice lateries Order Day Vencle type Day Leg Vencle Type Day Day <thday< th=""> <t< td=""><td></td><td></td><td>50 mph</td><td></td><td>V</td><td>ehicle</td><td>Mix</td><td></td><td></td><td></td><td></td><td></td></t<></thday<>			50 mph		V	ehicle	Mix							
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 50.0 feet Barrier Dist. to Dserver: 50.0 feet Centerline Dist. to Observer: 50.0 feet Barrier Distance to Observer: 50.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: -90.0 degrees Right View: -90.0 degrees Right View: 90.0 degrees VehicleType Traffic Flow Distance VehicleType Traffic Flow Distance VehicleType Table Peak Hour Leg Day Leq Evels (without Topo and barrier attenuation) Workset Leg Day VehicleType Leg Day Leg Day Leg Day Leg Deak Hour Leg Day Leg Evening Leg Night Left Autos: </td <td>Near/Far La</td> <td>ane Distance:</td> <td>60 feet</td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td>Day</td> <td>Evening</td> <td>Night</td> <td>Daily</td>	Near/Far La	ane Distance:	60 feet		-				Day	Evening	Night	Daily		
Barrier Type (Well, 1-Bern): 0.0 Heavy Trucks: 69.3% 8.7% 22.0% 3.119 Centerline Dist. to Diserver: 50.0 feet Noise Source Elevations (in feet) Barrier Type (Intrust): 2.00 feet Autos: 0.00 Noise Source Intrusts: 2.297 Observer Height (Above Pad): 5.0 feet Autos: 0.00 Medium Trucks: 2.297 Road Elevation: 0.0 feet Autos: 40.311 Heavy Trucks: 40.311 Medium Trucks: 40.311 Left View: 90.0 degrees Medium Trucks: 40.311 FHWA Noise Model Calculations Values: 70.2 0.51 1.30 -1.20 -4.65 0.000 0.000 Medium Trucks: 81.30 -11.02 1.34 -1.20 -4.65 0.000 0.000 Medium Trucks: 85.38 -14.13 1.33 -1.20 -5.43 0.000 0.000 Medium Trucks: 70.1 68.2	Site Data						AL	itos:	, 82.9%	7.1%	10.0%	90.52%		
Barrier Type (0-Wall, 1-Berm): 0.0 Heavy Trucks: 69.3% 8.7% 22.0% 3.113 Centerline Dist to Desriver: 50.0 feet Heavy Trucks: 69.3% 8.7% 22.0% 3.113 Centerline Dist to Desriver: 50.0 feet Heavy Trucks: 69.3% 8.7% 22.0% 3.113 Moise Source Elevations (in feet) Autos: 0.000 Autos: 0.000 Medium Trucks: 2.297 Heavy Trucks: 8.004 Grade Adjustment: 0.0 Road Elevation: 0.0 feet Autos: 40.01 Autos: 40.311 Autos: 40.311 FHWA Noise Model Calculations Medium Trucks: 40.091 Heavy Trucks: 40.091 Heavy Trucks: 40.010 0.000 0.000 Medium Trucks: 81.00 -11.02 1.30 -1.20 -4.65 0.000 0.000 Medium Trucks: 83.38 -14.13 1.33 -1.20 -4.65 0.000 0.000 Medium Trucks: 83.38 -14.13 1.33 -1.20 -4.65 <th>Ba</th> <th>rrier Heiaht:</th> <th>0.0 feet</th> <th></th> <th></th> <th>М</th> <th>edium Tru</th> <th>icks:</th> <th>82.8%</th> <th>5.6%</th> <th>11.7%</th> <th>6.37%</th>	Ba	rrier Heiaht:	0.0 feet			М	edium Tru	icks:	82.8%	5.6%	11.7%	6.37%		
Noise Source 50.0 feet Autos: 0.000 Barrier Distance to Observer: 0.0 feet Autos: 0.000 Observer Height (Above Pad) 5.0 feet Medium Trucks: 2.297 Pad Elevation: 0.0 feet Medium Trucks: 2.297 Road Elevation: 0.0 feet Lare Equivalent Distance (in feet) Lare Equivalent Distance (in feet) Road Grade 0.00% Medium Trucks: 40.091 Heavy Trucks: 40.091 Right View: 90.0 degrees Medium Trucks: 40.091 Heavy Trucks: 40.091 Vehicle Type REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Bern Atten Autos: 70.20 0.51 1.30 -1.20 -4.65 0.000 0.000 Medium Trucks: 81.00 -11.02 1.34 -1.20 -5.43 0.000 0.000 Unmitigated Noise Levels (without Topo and barrier attenuation) Uvenice Noise CNEL CNEL CNEL Autos: 70.1 68.5 62.8 61.3 <td></td> <td></td> <td>0.0</td> <td></td> <td></td> <td>1</td> <td>Heavy Tru</td> <td>icks:</td> <td>69.3%</td> <td>8.7%</td> <td>22.0%</td> <td>3.11%</td>			0.0			1	Heavy Tru	icks:	69.3%	8.7%	22.0%	3.11%		
Centerline Dist. to Observer: 50.0 feet Autos: 0.000 Barrier Distance to Observer: 0.0 feet Autos: 0.000 Observer Height (Above Pad): 5.0 feet Medium Trucks: 2.297 Pad Elevation: 0.0 feet Lane Equivalent Distance (in feet) Lane Equivalent Distance (in feet) Road Grade: 0.0% Left View: -90.0 degrees Autos: 40.091 PHWA Noise Model Calculations Vehicle Type REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berrier Atten Medium Trucks: 81.00 -11.02 1.34 -1.20 -4.65 0.000 0.00 Medium Trucks: 85.38 -14.13 1.33 -1.20 -5.43 0.000 0.00 Unnitigated Nolse Levels (without Topo and barrier attenuation) Vehicle Type Leg Paek Hour Leg Day Leg Evening Leg Night Ldn CNEL Autos: 70.1 68.5 62.8 61.3 69.8 70. Medium Trucks: 71.4 69.0	Centerline D	ist. to Barrier:	50.0 feet		N	loise S	ource Ele	vation	s (in fe	et)				
Barrier Distance to Observer. 0.0 feet Medium Trucks: 2.297 Observer Height (Above Pad): 5.0 feet Heavy Trucks: 8.004 Grade Adjustment: 0.0 Pad Elevation: 0.0 feet Lare Equivalent Distance (in feet) Lare Equivalent Distance (in feet) Road Grade: 0.0% Lare Equivalent Distance (in feet) Medium Trucks: 40.091 Heavy Trucks: 90.0 degrees Medium Trucks: 40.091 Heavy Trucks: 40.091 FHWA Noise Model Calculations Frite Road Fresnel Barrier Atten Berm Atten Autos: 70.2 0.51 1.30 -1.20 -4.65 0.000 0.00 Medium Trucks: 81.00 -11.02 1.34 -120 -5.43 0.000 0.00 Unnitigated Noise Levels (without Topo and barrier attenuation) Leq Evening Leq Evening Leq Neght CNEL Autos: 70.8 69.2 64.6 61.3 69.8 70.9 Medium Trucks: 71.4 69.0 66.0 65.3 72.3 72.3	Centerline Dist.	to Observer:	50.0 feet		-	0.00 0				50)				
Observer Height (Above Pad): 5.0 feet Heavy Trucks: 8.004 Grade Adjustment: 0.0 Road Elevation: 0.0 feet Lee Equivalent Distance (in feet) Lane Equivalent Distance (in feet) Lane Equivalent Distance (in feet) Lane Equivalent Distance (in feet) Left View: -90.0 degrees Autos: 40.311 Heavy Trucks: 40.311 FHWA Noise Model Calculations Extri View: 90.0 degrees Frite Road Fresnel Barrier Atten Bern Atten Autos: 70.2 0.51 1.30 -1.20 -4.65 0.000 0.00 Medium Trucks: 81.00 -11.02 1.34 -1.20 -4.65 0.000 0.00 Heavy Trucks: 85.38 -14.13 1.33 -1.20 -4.65 0.000 0.00 Unnitigated Noise Levels (without Topo and barrier attenuation) Use Viewing Leg Right Ldn CNEL Autos: 70.1 68.5 62.8 61.2 69.4 69.4 Medium Trucks: 70.4 65.5 67.8 75.5 75.5	Barrier Distance	to Observer:	0.0 feet			Modiu								
Pad Elevation: 0.0 feet Lane Equivalent Distance (in feet) Road Glevation: 0.0 feet Lane Equivalent Distance (in feet) Road Grade: 0.0% Autos: 40.311 Left View: -90.0 degrees Medium Trucks: 40.091 Heavy Trucks: 40.113 Heavy Trucks: 40.013 FHWA Noise Model Calculations Ernite Road Fresnel Barrier Atten Berm Atten Vehicle Type REMEL Traffic Flow Distance Finite Road Fessel 0.000 0.00 Medium Trucks: 81.00 -11.02 1.34 -1.20 -4.65 0.000 0.00 Medium Trucks: 81.00 -11.02 1.34 -1.20 -4.67 0.000 0.00 Medium Trucks: 81.00 -11.02 1.34 -1.20 -4.67 0.000 0.00 Unnitigated Noise Levels (without Topo and barrier attenuation) Vehicle Type Leg Peak Hour Leg Day Leg Evening Leg Night Ldn CNEL Autos: 70.1 68.5	Observer Height	(Above Pad):	5.0 feet							Grade Ad	iustment	.00		
Road Grade: 0.0% Autos: 40.311 Left View: -90.0 degrees Medium Trucks: 40.091 Right View: 90.0 degrees Medium Trucks: 40.091 FHWA Noise Model Calculations Distance Finite Road Fersnel Barrier Atten Berm Atten VehicleType REMEL Traffic Flow Distance Finite Road Fessnel Barrier Atten Berm Atten Medium Trucks: 81.00 -11.02 1.34 -1.20 -4.65 0.000 0.00 Medium Trucks: 85.38 -14.13 1.33 -1.20 -4.67 0.000 0.00 Medium Trucks: 85.38 -14.13 1.33 -1.20 -4.67 0.000 0.00 Unnitigated Noise Levels (without Topo and barrier attenuation) VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Autos: 70.1 68.2 64.6 61.3 69.8 70.1 Heavy Trucks: 71.4 69.0 66.0 65.	P	ad Elevation:	0.0 feet			Tiear	ly mucks.	0.0	104	onddo maj	dounion	. 0.0		
Left View: -90.0 degrees Medium Trucks: 40.091 Right View: 90.0 degrees Heavy Trucks: 40.091 FHWA Noise Model Calculations Entite Road Fresnel Barrier Atten Berm Atten VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berm Atten Autos: 70.2 0.51 1.30 -1.20 -4.65 0.000 0.00 Medium Trucks: 81.00 -11.02 1.34 -120 -4.67 0.000 0.00 Unnitigated Noise Levels (without Topo and barrier attenuation) VehicleType Leg Day Leg Evening Leg Night Ldn CNEL Autos: 70.1 68.5 62.8 61.2 69.4 69.8 70. Medium Trucks: 71.4 69.0 66.0 65.3 72.3 72. Vehicle Noise: 75.6 73.7 69.4 67.8 75.5 75. Centerline Distance to Noise Contour (in feet) 116 250 539	Ro	ad Elevation:	0.0 feet		L	ane Eq	uivalent l	Distand	e (in f	eet)				
Right View: 90.0 degrees Heavy Trucks: 40.113 FHWA Noise Model Calculations Environmentation Finite Road Fresnel Barrier Atten Berm Atten VehicleType REIMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berm Atten Medium Trucks: 70.20 0.51 1.30 -1.20 -4.65 0.000 0.000 Heavy Trucks: 85.38 -14.13 1.33 -1.20 -5.43 0.000 0.000 Unmitigated Noise Levels (without Topo and barrier attenuation) Leq Day Leq Reing Leq Reing Leq Night Ldn CNEL Autos: 70.8 69.2 64.6 61.3 66.8 70. Medium Trucks: 70.1 68.5 62.8 61.2 69.4 69.4 69.4 69.4 69.4 69.4 69.4 69.4 69.5 75.5 75.5 Vehicle Noise: 75.6 73.7 69.4 67.8 75.5 75.5 Vehicle Noise:		Road Grade:	0.0%				Autos:	40.3	311					
FHWA Noise Model Calculations FWWA Noise Model Calculations WehicheType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berm Atten Autos: 70.20 0.51 1.30 -1.20 -4.65 0.000 0.000 Medium Trucks: 81.00 -11.02 1.34 -1.20 -4.65 0.000 0.000 Heavy Trucks: 85.38 -14.13 1.33 -1.20 -5.43 0.000 0.000 Unnitigated Noise Levels (without Topo and barrier attenuation) CNEL Autos: 70.8 69.2 64.6 61.3 69.8 70.1 Medium Trucks: 70.1 68.5 62.8 61.2 69.4 69.8 70.2 Heavy Trucks: 71.4 69.0 66.0 65.3 72.3 72.2 Vehicle Noise: 75.6 73.7 69.4 67.8 75.5 75.5 Centerline Distance to Noise Contour (in feet)		Left View:	-90.0 degre	es		Mediu	m Trucks:	40.0)91					
VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berm Atten Autos: 70.20 0.51 1.30 -1.20 -4.65 0.000 0.000 Medium Trucks: 81.00 -11.02 1.34 -1.20 -4.65 0.000 0.000 Heavy Trucks: 85.38 -14.13 1.33 -1.20 -5.43 0.000 0.000 Unnitigated Noise Levels (without Topo and barrier attenuation) CNEL VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Autos: 70.8 69.2 64.6 61.3 69.8 70. Medium Trucks: 70.1 68.5 62.8 61.2 69.4 69.9 Heavy Trucks: 71.4 69.0 66.0 65.3 72.3 72. Vehicle Noise: 75.6 73.7 69.4 67.8 75.5 75. Centerline Distance to Noise Contour (in		Right View:	90.0 degre	es		Heav	/y Trucks:	40.1	113					
Autos: 70.20 0.51 1.30 -1.20 -4.65 0.000 0.000 Medium Trucks: 81.00 -11.02 1.34 -120 -4.65 0.000 0.000 Heavy Trucks: 85.38 -14.13 1.33 -1.20 -5.43 0.000 0.000 Unnitigated Noise Levels (without Topo and barrier attenuation) Leq Pask Hour Leq Day Leq Evening Leq Night Ldn CNEL Autos: 70.8 69.2 64.6 61.3 69.8 70. Medium Trucks: 70.1 68.5 62.8 61.2 69.4 69.8 70.2 Vehicle Noise: 75.6 73.7 69.4 67.8 75.5 75. Centerline Distance to Noise Contour (in feet) To dBA 65 dBA 60 dBA 55 dBA Ldr: 116 250 539 1,160	FHWA Noise Mod	lel Calculation	15											
Medium Trucks: 81.00 -11.02 1.34 -1.20 -4.87 0.000 0.000 Heavy Trucks: 85.38 -14.13 1.33 -1.20 -5.43 0.000 0.000 Unnitigated Noise Levels (without Topo and barrier attenuation) - - - - - - - - - - 0.000	VehicleType	REMEL	Traffic Flow	Dista	ance	Finite	Road	Fresn	el i	Barrier Att	en Ber	m Atten		
Heavy Trucks: 85.38 -14.13 1.33 -1.20 -5.43 0.000 0.000 Unnitigated Noise Levels (without Topo and barrier attenuation) Leq Day Leq Evening Leq Night Ldn CNEL VehicleType Leq Peak How Leq Day Leq Evening Leq Night Ldn CNEL Medium Trucks: 70.1 68.5 62.8 61.2 69.4 69.9 Heavy Trucks: 70.1 69.0 66.0 65.3 72.3 72.9 Vehicle Noise: 75.6 73.7 69.4 67.8 75.5 75.5 Centerline Distance to Noise Contour (in feet)	Autos:	70.20	0.51		1.30		-1.20		4.65	0.0	000	0.000		
Unmitigated Noise Levels (without Topo and barrier attenuation) Leq Night Ldn CNEL VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Autos: 70.8 69.2 64.6 61.3 69.8 70.0 Medium Trucks: 70.1 68.5 62.8 61.2 69.4 69.9 Heavy Trucks: 71.4 69.0 66.0 65.3 72.3 72.3 Vehicle Noise: 75.6 73.7 69.4 67.8 75.5 75.5 Centerline Distance to Noise Contour (in feet)	Medium Trucks:	81.00	-11.02		1.34		-1.20		-4.87	0.0	000	0.000		
VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Autos: 70.8 69.2 64.6 61.3 69.8 70.0 Medium Trucks: 70.1 68.5 62.8 61.2 69.4 69.9 Heavy Trucks: 71.4 69.0 66.0 65.3 72.3 72. Vehicle Noise: 75.6 73.7 69.4 67.8 75.5 75. Centerline Distance to Noise Contour (in feet)	Heavy Trucks:	85.38	-14.13		1.33		-1.20		-5.43	0.0	000	0.000		
Autos: 70.8 69.2 64.6 61.3 69.8 70. Medium Trucks: 70.1 68.5 62.8 61.2 69.4 69. Heavy Trucks: 71.4 69.0 66.0 65.3 72.3 72. Vehicle Noise: 75.6 73.7 69.4 67.8 75.5 75. Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA Ldn: 116 250 539 1,160	Unmitigated Nois	e Levels (with	nout Topo and	barrier	r attenu	lation)								
Medium Trucks: 70.1 68.5 62.8 61.2 69.4 69.9 Heavy Trucks: 71.4 69.0 66.0 65.3 72.3 72. Vehicle Noise: 75.6 73.7 69.4 69.4 69.7 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA Ldn: 116 250 539 1,160	VehicleType	Leq Peak Ho	ur Leq Daj	y .	Leq Eve	ening	Leq N	light		Ldn	C			
Heavy Trucks: 71.4 69.0 66.0 65.3 72.3 72.2 Vehicle Noise: 75.6 73.7 69.4 67.8 75.5 75.5 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA Ldn: 116 250 539 1,160	Autos:	70	0.8	69.2		64.6		61.3		69.8	3	70.1		
Vehicle Noise: 75.6 73.7 69.4 67.8 75.5 75. Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA Ldn: 116 250 539 1,160												69.7		
Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA Ldn: 116 250 539 1,160	Heavy Trucks:	71	1.4	69.0		66.0		65.3		72.3	5	72.6		
70 dBA 65 dBA 60 dBA 55 dBA Ldn: 116 250 539 1,160	Vehicle Noise:	75	5.6	73.7		69.4		67.8		75.5	5	75.8		
Ldn: 116 250 539 1,160	Centerline Distan	ce to Noise C	ontour (in fee	t)										
									6					
CNEL: 121 261 562 1,212						-		-						
			С	NEL:	121	1	261	1		562	1,	212		

Monday, April 17, 2017

Monday, April 17, 2017

Monday, April 17, 2017

APPENDIX 9.1:

REFERENCE DISTRIBUTION/WAREHOUSE NOISE SOURCE PHOTOS



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Reference Measurement: Motivational Fulfillment 6810 Bickmore Avenue, Chino



Motivational Fulfillment_01

Motivational Fulfillment_02



Motivational Fulfillment_03

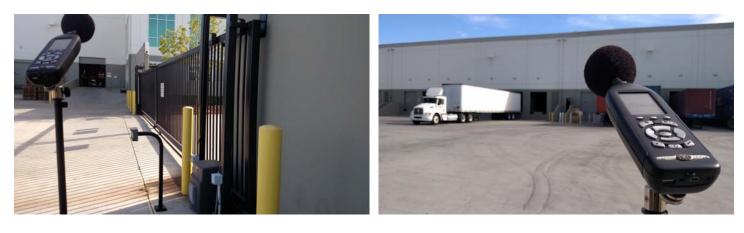
Source_1-1



Source_1-2

Source_1-3

Reference Measurement: Motivational Fulfillment 6810 Bickmore Avenue, Chino



Source_1-4

Source_2-1



Source_2-2

Source_2-3



Source_2-4

Source_2-5

Reference Measurement: Motivational Fulfillment 6810 Bickmore Avenue, Chino



Source_2-6

Source_2-7



Source_2-8

Source_2-9

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APPENDIX 9.2:

OPERATIONAL STATIONARY-SOURCE NOISE CALCULATIONS



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Observer Location: R1

Source: Unloading/Docking Activity Condition: Operational

Project Name:	Gateway South
Job Number:	10189
Analyst:	A. Wolfe

NOISE MODEL INPUTS Noise Distance to Observer 1,014.0 feet Barrier Height: 0.0 feet Noise Source Height: 8.0 feet Noise Distance to Barrier: 1,014.0 feet **Observer Height:** 5.0 feet Barrier Distance to Observer: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0 Observer Elevation: 0.0 feet Drop Off Coefficient: 20.0 Noise Source Elevation: 0.0 feet 20 = 6 dBA per doubling of distance Barrier Elevation: 0.0 feet

15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS										
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax			
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0			
Distance Attenuation	1,014.0	-30.6	-30.6	-30.6	-30.6	-30.6	-30.6			
Shielding (Barrier Attenuation)	1,014.0	0.0	0.0	0.0	0.0	0.0	0.0			
Raw (Distance + Barrier)		36.6	-30.6	-30.6	-30.6	-30.6	-30.6			
60 Minute Hourly Adjustmer	nt	36.6	-30.6	-30.6	-30.6	-30.6	-30.6			

S	TATIONARY SOURCE N	OISE PREDICTION MODEL	4/17/2017
Observer Location: R1 Source: Roof-Top A Condition: Operationa	Air Conditioning Unit	Project Name: Gateway South Job Number: 10189 Analyst: A. Wolfe	
	NOISE MOD	DEL INPUTS	
Noise Distance to Observer	,710.0 feet	Barrier Height:	0.0 feet
Noise Distance to Barrier: 1	,710.0 feet	Noise Source Height:	5.0 feet
Barrier Distance to Observer:	0.0 feet	Observer Height:	5.0 feet
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0
Noise Source Elevation:	30.0 feet	Drop Off Coefficient:	20.0
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling o 15 = 4.5 dBA per doubling	

NOISE MODEL PROJECTIONS								
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax	
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0	
Distance Attenuation	1,710.0	-50.7	-50.7	-50.7	-50.7	-50.7	-50.7	
Shielding (Barrier Attenuation)	1,710.0	0.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		26.5	-50.7	-50.7	-50.7	-50.7	-50.7	
39 Minute Hourly Adjustmer	nt	24.6	-52.6	-52.6	-52.6	-52.6	-52.6	

Observer Location: R2

Source: Unloading/Docking Activity Condition: Operational Project Name: Gateway South Job Number: 10189 Analyst: A. Wolfe

NOISE MODEL INPUTS								
Noise Distance to Observer	528.0 feet	Barrier Height:	0.0 feet					
Noise Distance to Barrier:	528.0 feet	Noise Source Height:	8.0 feet					
Barrier Distance to Observer:	0.0 feet	Observer Height:	5.0 feet					
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0					
Noise Source Elevation:	0.0 feet	Drop Off Coefficient:	20.0					
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling c 15 = 4.5 dBA per doubling						

NOISE MODEL PROJECTIONS								
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax	
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0	
Distance Attenuation	528.0	-24.9	-24.9	-24.9	-24.9	-24.9	-24.9	
Shielding (Barrier Attenuation)	528.0	0.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		42.3	-24.9	-24.9	-24.9	-24.9	-24.9	
60 Minute Hourly Adjustmen	nt	42.3	-24.9	-24.9	-24.9	-24.9	-24.9	

ST	ATIONARY SOURCE N	OISE PREDICTION MODEL	4/17/2017						
Observer Location: R2 Source: Roof-Top Ai Condition: Operational	•	Project Name: Gateway South Job Number: 10189 Analyst: A. Wolfe							
	NOISE MODEL INPUTS								
Noise Distance to Observer 1,	230.0 feet	Barrier Height:	0.0 feet						
Noise Distance to Barrier: 1,	230.0 feet	Noise Source Height:	5.0 feet						
Barrier Distance to Observer:	0.0 feet	Observer Height:	5.0 feet						
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0						
Noise Source Elevation:	30.0 feet	Drop Off Coefficient:	20.0						
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling of 0 15 = 4.5 dBA per doubling o							

NOISE MODEL PROJECTIONS								
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax	
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0	
Distance Attenuation	1,230.0	-47.8	-47.8	-47.8	-47.8	-47.8	-47.8	
Shielding (Barrier Attenuation)	1,230.0	0.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		29.4	-47.8	-47.8	-47.8	-47.8	-47.8	
39 Minute Hourly Adjustmer	nt	27.5	-49.7	-49.7	-49.7	-49.7	-49.7	

Observer Location: R3

Source: Unloading/Docking Activity Condition: Operational Project Name: Gateway South Job Number: 10189 Analyst: A. Wolfe

NOISE MODEL INPUTS								
Noise Distance to Observer	351.0 feet	Barrier Height:	0.0 feet					
Noise Distance to Barrier:	351.0 feet	Noise Source Height:	8.0 feet					
Barrier Distance to Observer:	0.0 feet	Observer Height:	5.0 feet					
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0					
Noise Source Elevation:	0.0 feet	Drop Off Coefficient:	20.0					
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling c 15 = 4.5 dBA per doubling						

NOISE MODEL PROJECTIONS								
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax	
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0	
Distance Attenuation	351.0	-21.4	-21.4	-21.4	-21.4	-21.4	-21.4	
Shielding (Barrier Attenuation)	351.0	0.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		45.8	-21.4	-21.4	-21.4	-21.4	-21.4	
60 Minute Hourly Adjustmer	nt	45.8	-21.4	-21.4	-21.4	-21.4	-21.4	

S	TATIONARY SOURCE N	OISE PREDICTION MODEL	4/17/2017						
Observer Location: R3 Source: Roof-Top Condition: Operation	Air Conditioning Unit al	Project Name: Gateway South Job Number: 10189 Analyst: A. Wolfe							
	NOISE MODEL INPUTS								
Noise Distance to Observer	982.0 feet	Barrier Height:	0.0 feet						
Noise Distance to Barrier:	982.0 feet	Noise Source Height:	5.0 feet						
Barrier Distance to Observer:	0.0 feet	Observer Height:	5.0 feet						
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0						
Noise Source Elevation:	30.0 feet	Drop Off Coefficient:	20.0						
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling o 15 = 4.5 dBA per doubling							

NOISE MODEL PROJECTIONS								
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax	
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0	
Distance Attenuation	982.0	-45.9	-45.9	-45.9	-45.9	-45.9	-45.9	
Shielding (Barrier Attenuation)	982.0	0.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		31.3	-45.9	-45.9	-45.9	-45.9	-45.9	
39 Minute Hourly Adjustmer	nt	29.4	-47.8	-47.8	-47.8	-47.8	-47.8	

Observer Location: R4

Source: Unloading/Docking Activity Condition: Operational Project Name: Gateway South Job Number: 10189 Analyst: A. Wolfe

NOISE MODEL INPUTS								
Noise Distance to Observer	755.0 feet	Barrier Height:	0.0 feet					
Noise Distance to Barrier:	755.0 feet	Noise Source Height:	8.0 feet					
Barrier Distance to Observer:	0.0 feet	Observer Height:	5.0 feet					
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0					
Noise Source Elevation:	0.0 feet	Drop Off Coefficient:	20.0					
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling c 15 = 4.5 dBA per doubling						

NOISE MODEL PROJECTIONS								
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax	
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0	
Distance Attenuation	755.0	-28.0	-28.0	-28.0	-28.0	-28.0	-28.0	
Shielding (Barrier Attenuation)	755.0	0.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		39.2	-28.0	-28.0	-28.0	-28.0	-28.0	
60 Minute Hourly Adjustmen	nt	39.2	-28.0	-28.0	-28.0	-28.0	-28.0	

S	TATIONARY SOURCE N	OISE PREDICTION MODEL	4/17/2017						
Observer Location: R4 Source: Roof-Top Condition: Operation	Air Conditioning Unit al	Project Name: Gateway South Job Number: 10189 Analyst: A. Wolfe							
	NOISE MODEL INPUTS								
Noise Distance to Observer	901.0 feet	Barrier Height:	0.0 feet						
Noise Distance to Barrier:	901.0 feet	Noise Source Height:	5.0 feet						
Barrier Distance to Observer:	0.0 feet	Observer Height:	5.0 feet						
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0						
Noise Source Elevation:	30.0 feet	Drop Off Coefficient:	20.0						
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling o 15 = 4.5 dBA per doubling							

NOISE MODEL PROJECTIONS							
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	901.0	-45.1	-45.1	-45.1	-45.1	-45.1	-45.1
Shielding (Barrier Attenuation)	901.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		32.1	-45.1	-45.1	-45.1	-45.1	-45.1
39 Minute Hourly Adjustmer	nt	30.2	-47.0	-47.0	-47.0	-47.0	-47.0

Observer Location: R5

Source: Unloading/Docking Activity Condition: Operational Project Name: Gateway South Job Number: 10189 Analyst: A. Wolfe

NOISE MODEL INPUTS								
Noise Distance to Observer	714.0 feet	Barrier Height:	0.0 feet					
Noise Distance to Barrier:	714.0 feet	Noise Source Height:	8.0 feet					
Barrier Distance to Observer:	0.0 feet	Observer Height:	5.0 feet					
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0					
Noise Source Elevation:	0.0 feet	Drop Off Coefficient:	20.0					
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling o 15 = 4.5 dBA per doubling						

NOISE MODEL PROJECTIONS							
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	714.0	-27.5	-27.5	-27.5	-27.5	-27.5	-27.5
Shielding (Barrier Attenuation)	714.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		39.7	-27.5	-27.5	-27.5	-27.5	-27.5
60 Minute Hourly Adjustmer	nt	39.7	-27.5	-27.5	-27.5	-27.5	-27.5

S	TATIONARY SOURCE NO	DISE PREDICTION MODEL	4/17/2017						
Observer Location: R5 Source: Roof-Top Air Conditioning Unit Condition: Operational		Project Name: Gateway South Job Number: 10189 Analyst: A. Wolfe							
	NOISE MODEL INPUTS								
Noise Distance to Observer	652.0 feet	Barrier Height:	0.0 feet						
Noise Distance to Barrier:	652.0 feet	Noise Source Height:	5.0 feet						
Barrier Distance to Observer:	0.0 feet	Observer Height:	5.0 feet						
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0						
Noise Source Elevation:	30.0 feet	Drop Off Coefficient:	20.0						
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling 15 = 4.5 dBA per doubling							

NOISE MODEL PROJECTIONS							
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	652.0	-42.3	-42.3	-42.3	-42.3	-42.3	-42.3
Shielding (Barrier Attenuation)	652.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		34.9	-42.3	-42.3	-42.3	-42.3	-42.3
39 Minute Hourly Adjustmer	nt	33.0	-44.2	-44.2	-44.2	-44.2	-44.2

Observer Location: R6

Source: Unloading/Docking Activity Condition: Operational Project Name: Gateway South Job Number: 10189 Analyst: A. Wolfe

NOISE MODEL INPUTS							
Noise Distance to Observer	273.0 feet	Barrier Height:	0.0 feet				
Noise Distance to Barrier:	273.0 feet	Noise Source Height:	8.0 feet				
Barrier Distance to Observer:	0.0 feet	Observer Height:	5.0 feet				
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0				
Noise Source Elevation:	0.0 feet	Drop Off Coefficient:	20.0				
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling o 15 = 4.5 dBA per doubling					

NOISE MODEL PROJECTIONS								
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax	
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0	
Distance Attenuation	273.0	-19.2	-19.2	-19.2	-19.2	-19.2	-19.2	
Shielding (Barrier Attenuation)	273.0	0.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		48.0	-19.2	-19.2	-19.2	-19.2	-19.2	
60 Minute Hourly Adjustmen	nt	48.0	-19.2	-19.2	-19.2	-19.2	-19.2	

S	TATIONARY SOURCE N	DISE PREDICTION MODEL	4/17/2017						
Observer Location: R6 Source: Roof-Top Air Conditioning Unit Condition: Operational		Project Name: Gateway South Job Number: 10189 Analyst: A. Wolfe							
	NOISE MODEL INPUTS								
Noise Distance to Observer	501.0 feet	Barrier Height:	0.0 feet						
Noise Distance to Barrier:	501.0 feet	Noise Source Height:	5.0 feet						
Barrier Distance to Observer:	0.0 feet	Observer Height:	5.0 feet						
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0						
Noise Source Elevation:	30.0 feet	Drop Off Coefficient:	20.0						
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling o 15 = 4.5 dBA per doubling							

NOISE MODEL PROJECTIONS							
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	501.0	-40.0	-40.0	-40.0	-40.0	-40.0	-40.0
Shielding (Barrier Attenuation)	501.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		37.2	-40.0	-40.0	-40.0	-40.0	-40.0
39 Minute Hourly Adjustmer	nt	35.3	-41.9	-41.9	-41.9	-41.9	-41.9

Observer Location: R7

Source: Unloading/Docking Activity Condition: Operational Project Name: Gateway South Job Number: 10189 Analyst: A. Wolfe

NOISE MODEL INPUTS							
Noise Distance to Observer	929.0 feet	Barrier Height:	0.0 feet				
Noise Distance to Barrier:	929.0 feet	Noise Source Height:	8.0 feet				
Barrier Distance to Observer:	0.0 feet	Observer Height:	5.0 feet				
Observer Elevation:	0.0 feet	Barrier Type (0-Wall, 1-Berm):	0				
Noise Source Elevation:	0.0 feet	Drop Off Coefficient:	20.0				
Barrier Elevation:	0.0 feet	20 = 6 dBA per doubling o 15 = 4.5 dBA per doubling					

NOISE MODEL PROJECTIONS								
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax	
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0	
Distance Attenuation	929.0	-29.8	-29.8	-29.8	-29.8	-29.8	-29.8	
Shielding (Barrier Attenuation)	929.0	0.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		37.4	-29.8	-29.8	-29.8	-29.8	-29.8	
60 Minute Hourly Adjustmen	nt	37.4	-29.8	-29.8	-29.8	-29.8	-29.8	

STATIONARY SC	OURCE NOISE PREDICTION MODEL	4/17/2017							
Observer Location: R7 Source: Roof-Top Air Conditioning Condition: Operational	Project Name: Gateway South Unit Job Number: 10189 Analyst: A. Wolfe								
NO	NOISE MODEL INPUTS								
Noise Distance to Observer 1,137.0 feet	Barrier Height:	0.0 feet							
Noise Distance to Barrier: 1,137.0 feet	Noise Source Height:	5.0 feet							
Barrier Distance to Observer: 0.0 feet	Observer Height:	5.0 feet							
Observer Elevation: 0.0 feet	Barrier Type (0-Wall, 1-Berm):	0							
Noise Source Elevation: 30.0 feet	Drop Off Coefficient:	20.0							
Barrier Elevation: 0.0 feet	20 = 6 dBA per doubling of 15 = 4.5 dBA per doubling c								

NOISE MODEL PROJECTIONS							
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	1,137.0	-47.1	-47.1	-47.1	-47.1	-47.1	-47.1
Shielding (Barrier Attenuation)	1,137.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		30.1	-47.1	-47.1	-47.1	-47.1	-47.1
39 Minute Hourly Adjustmer	nt	28.2	-49.0	-49.0	-49.0	-49.0	-49.0

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