APPENDIX 9

Noise Analysis

Airport Gateway Specific Plan

NOISE IMPACT ANALYSIS

CITIES OF SAN BERNARDINO AND HIGHLAND

PREPARED BY:

Bill Lawson, PE, INCE
blawson@urbanxroads.com
(949) 584-3148

Sama Shami
sshami@urbanxroads.com
(949) 945-4407

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
ANSI	American National Standards Institute
Calveno	California Vehicle Noise
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dBA	A-weighted decibels
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
INCE	Institute of Noise Control Engineering
L_{eq}	Equivalent continuous (average) sound level
L_{max}	Maximum level measured over the time interval
L_{min}	Minimum level measured over the time interval
mph	Miles per hour
OPR	Office of Planning and Research
PPV	Peak particle velocity
Project	Airport Gateway Specific Plan
REMEL	Reference Energy Mean Emission Level
RMS	Root-mean-square
VdB	Vibration Decibels

EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to determine the potential noise impacts and the necessary noise mitigation measures, if any, for Airport Gateway Specific Plan development ("Project"). The Project area covers approximately 679.2 acres with parcels in both the City of Highland and the City of San Bernardino. At the time this noise analysis was prepared, the future tenants of the proposed Project were unknown, and therefore, this noise study includes a conservative analysis of the proposed Project uses. This study has been prepared to satisfy applicable Cities of San Bernardino and Highland standards and thresholds of significance based on guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1)

The results of this Airport Gateway Specific Plan 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 under CEQA before and after any required mitigation measures.

TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	Mitigated
Off-Site Traffic Noise	7	*Potentially Significant*	*Significant and Unavoidable*
Operational Noise	9	*Potentially Significant*	*Less Than Significant*
Construction Noise	10	*Less Than Significant*	-
Construction Vibration		*Less Than Significant*	-

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1 INTRODUCTION

This noise analysis has been completed to determine the noise impacts associated with the development of Airport Gateway Specific Plan (AGSP) ("Project"). This noise study briefly describes the proposed Project, provides information regarding noise fundamentals, sets out the local regulatory setting, presents the study methods and procedures for transportation related CNEL traffic noise analysis, and evaluates the future exterior noise environment. In addition, this study includes an analysis of the potential Project-related long-term stationary-source operational noise and short-term construction noise and vibration impacts.

1.1 SITE LOCATION

The Airport Gateway Specific Plan Project is located immediately north of the San Bernardino International Airport (SBIA) west. The Specific Plan area is bounded generally by 6th Street and Highland Creek on the north, 3rd Street and the SBIA on the south, State Route 210 (SR-210) on the east, and Tippecanoe Avenue on the west as shown on Exhibit 1-A. North of the Specific Plan area (on the north side of 6th Street) is bordered by a mix of low- and medium-density residential uses and vacant parcels, as well as several public facilities including Indian Springs High School, Cypress Elementary School, Highland Community Park and the Highland Branch Library.

1.2 PROJECT DESCRIPTION

The Project area covers approximately 679.2 acres. The Specific Plan area includes parcels in both the City of Highland (485 acres) and the City of San Bernardino (194.2 acres). The Specific Plan area is depicted on Exhibit 1-B.

The existing uses within the Specific Plan area include single-family and multi-family residential, small-lot commercial, educational facilities, and industrial uses. Vacant parcels make up approximately 209 acres of the Specific Plan area. The AGSP would replace the existing uses within the Specific Plan area with approximately 9.2 million square feet of Industrial Mixed Uses, consisting of industrial warehouse, high-cube logistics warehouse, tech business park, and a small amount of commercial/retail/hotel uses. Development of the Specific Plan area will be accomplished over time, as market conditions allow, and as developers are successful in assembling individual parcels into parcels large enough for the allowed uses.

The on-site Project-related operations are expected to include a combination of noise source activities that will likely include: loading dock activity, delivery van activity, roof-top air conditioning units, parking lot vehicle activity, and trash enclosure activity. This noise analysis is intended to describe noise level impacts associated with the expected typical operational activities at the Project site. To present a conservative approach, this report assumes the Project will operate 24-hours daily for seven days per week.

EXHIBIT 1-A: LOCATION MAP

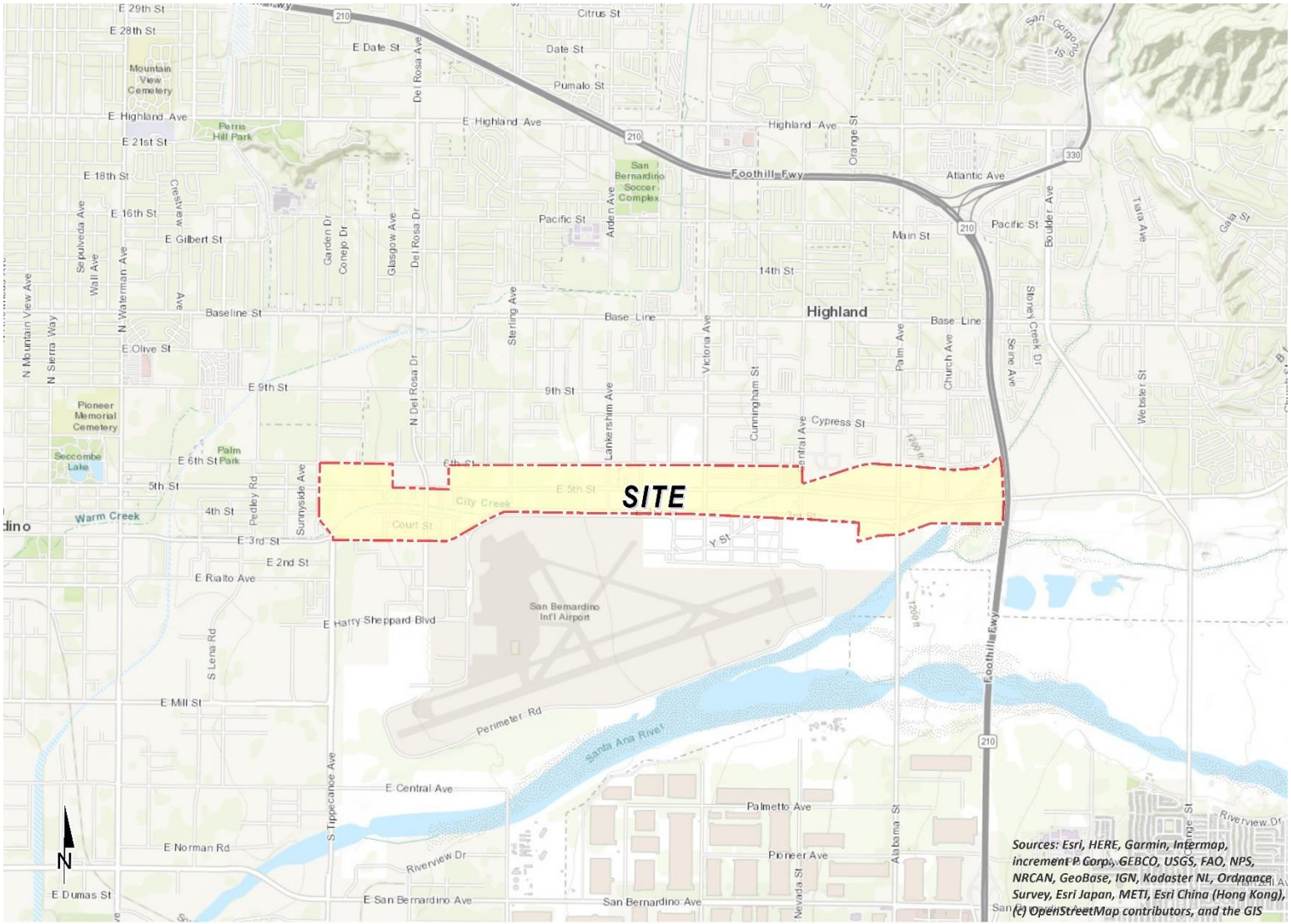
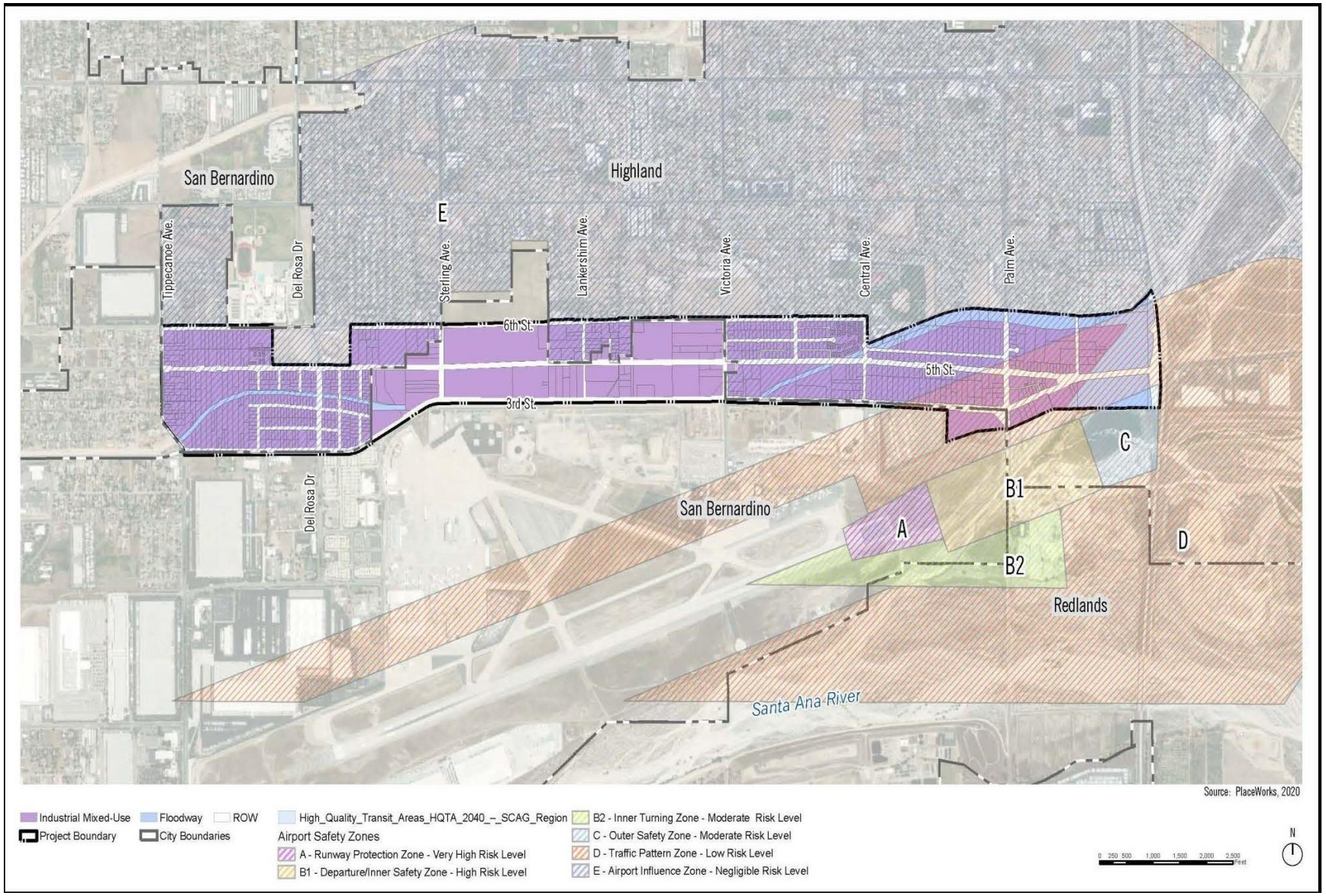


EXHIBIT 1-B: SITE PLAN



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2 FUNDAMENTALS

Noise is 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.

EXHIBIT 2-A: TYPICAL NOISE LEVELS

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

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. (2) 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. (3) 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 used figure is the equivalent level (L_{eq}). 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 (L_{eq}) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period (typically one hour) and is commonly used to describe the "average" noise levels within the environment.

To describe the time-varying character of environmental noise, the statistical or percentile noise descriptors L_{50}, L_{25}, L_8 and L_2, are commonly used. The percentile noise descriptors are the noise levels equaled or exceeded during 50 percent, 25 percent, 8 percent and 2 percent of a stated time. Sound levels associated with the L_2 and L_8 typically describe transient or short-term events, while levels associated with the L_{50} describe the steady state (or median) noise conditions. The relies on the percentile noise levels to describe the stationary source noise level limits. While the L_{50} describes the noise levels occurring 50 percent of the time, the L_{eq} accounts for the total energy (average) observed for the entire hour.

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 Community Noise Equivalent Level (CNEL), representing a composite 24-hour noise level is utilized. The CNEL is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time of day corrections require the addition of 5 decibels to dBA L_{eq} sound levels in the evening from 7:00 p.m. to 10:00 p.m., and the addition of 10 decibels to dBA L_{eq} sound levels at night between 10:00 p.m. and 7:00 a.m. These additions are made to account for the noise sensitive time periods during the evening and night hours when sound appears louder. CNEL does not represent the actual sound level heard at any time, but rather represents the total sound exposure. The Cities of San Bernardino and Highland relies on the 24-hour CNEL level to assess land use compatibility with transportation related noise sources.

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)

2.3.2 GROUND ABSORPTION

The propagation path of noise from a highway to a receiver 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 receiver, 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 receiver 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. (4)

2.3.3 ATMOSPHERIC EFFECTS

Receivers 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 have significant effects. (2)

2.3.4 SHIELDING

A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. 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 nearest residents. 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 Federal Highway Administration (FHWA) does not consider the planting of vegetation to be a noise abatement measure. (4)

2.3.5 REFLECTION

Field studies conducted by the FHWA have shown that the reflection from barriers and buildings does not substantially increase noise levels. (4) If all the noise striking a structure was reflected back to a given receiving point, the increase would be theoretically limited to 3 dBA. Further, not all the acoustical energy is reflected back to same point. Some of the energy would go over the structure, some is reflected to points other than the given receiving point, some is scattered by ground coverings (e.g., grass and other plants), and some is blocked by intervening structures and/or obstacles (e.g., the noise source itself). Additionally, some of the reflected energy is lost due to the longer path that the noise must travel. FHWA measurements made to quantify

reflective increases in traffic noise have not shown an increase of greater than 1-2 dBA; an increase that is not perceptible to the average human ear.

2.4 NOISE CONTROL

Noise control is the process of obtaining an acceptable noise environment for an observation point or receiver by controlling the noise source, transmission path, receiver, or all three. This concept is known as the source-path-receiver 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 up to 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 receiver. 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. (4)

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. (5)

2.7 COMMUNITY RESPONSE TO NOISE

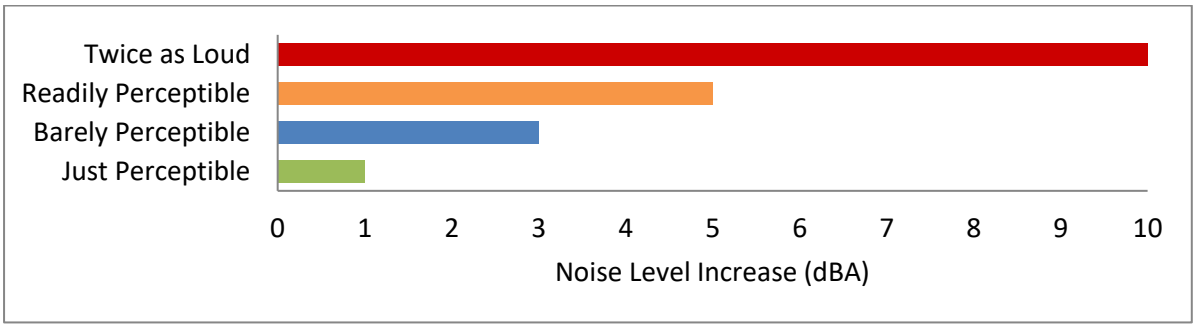
Community responses to noise may range from registering a complaint by telephone or letter, to initiating court action, depending upon everyone's susceptibility to noise and personal attitudes about noise. Several factors are related to the level of community annoyance including:

- 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. 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. (6) 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. (6) 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. A change of 3 dBA are considered *barely perceptible*, and changes of 5 dBA are considered *readily perceptible*. (4)

EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION



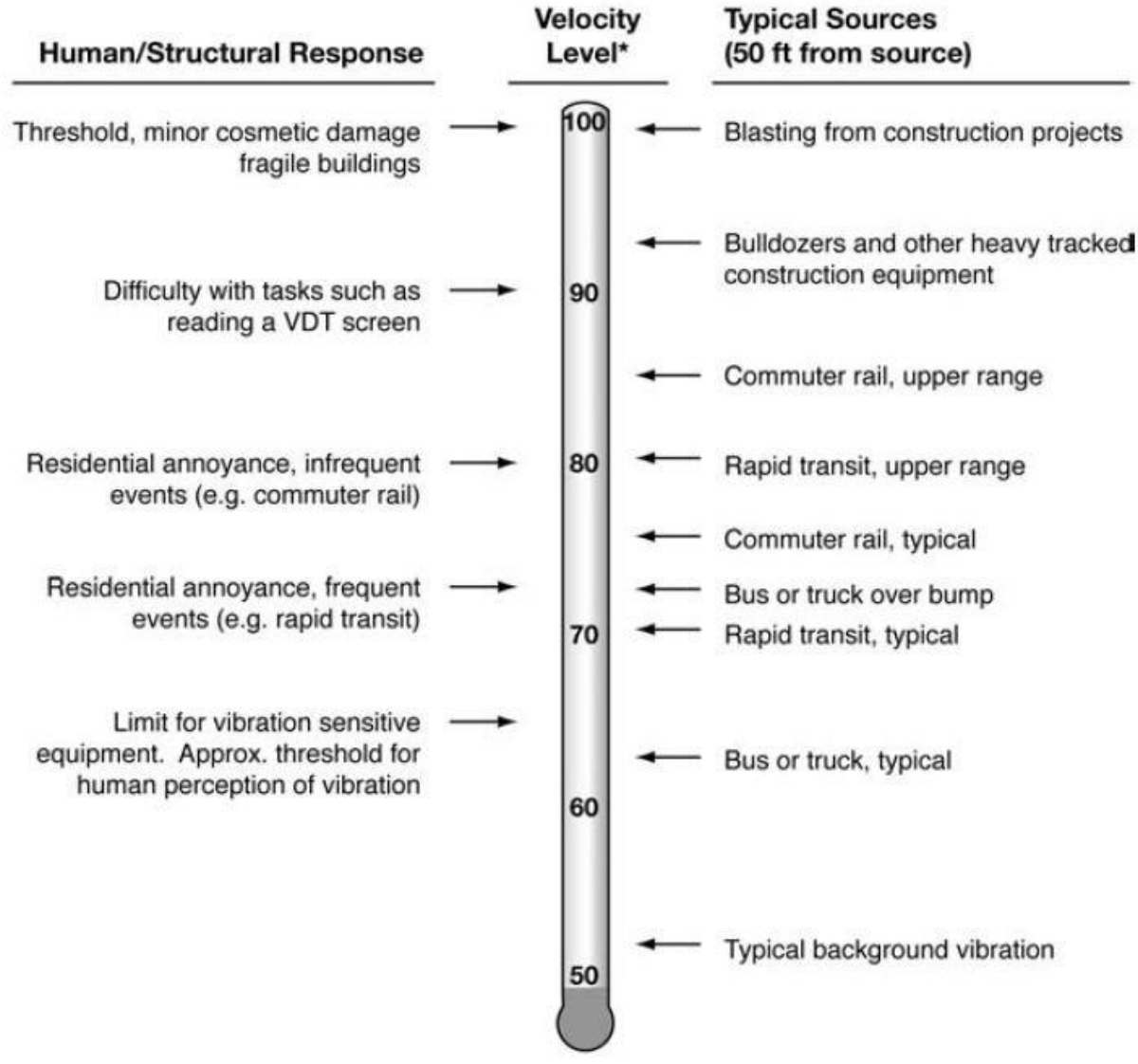
2.8 VIBRATION

Per the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual* (7), 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 ground-borne 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 (VdB) serves to reduce the range of numbers used to describe human response to vibration. 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 and/or activities

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



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

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 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 per guidelines adopted by the Governor's Office of Planning and Research (OPR). (8) The purpose of the Noise Element is to *limit the exposure of the community to excessive noise levels*. In addition, the California Environmental Quality Act (CEQA) requires that all known environmental effects of a project be analyzed, including environmental noise impacts.

3.2 STATE OF CALIFORNIA GREEN BUILDING STANDARDS CODE

The State of California's Green Building Standards Code (CALGreen) contains mandatory measures for non-residential building construction in Section 5.507 on Environmental Comfort. (9) 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 shall be constructed to provide an interior noise environment attributable to exterior sources that does not exceed an hourly equivalent noise level of 50 dBA L_{eq} in occupied areas during any hour of operation (Section 5.507.4.2).

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. (10) The Noise Element provides policy guidance which addresses the generation, mitigation, avoidance, and the control of excessive noise. To protect the 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 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. (10)

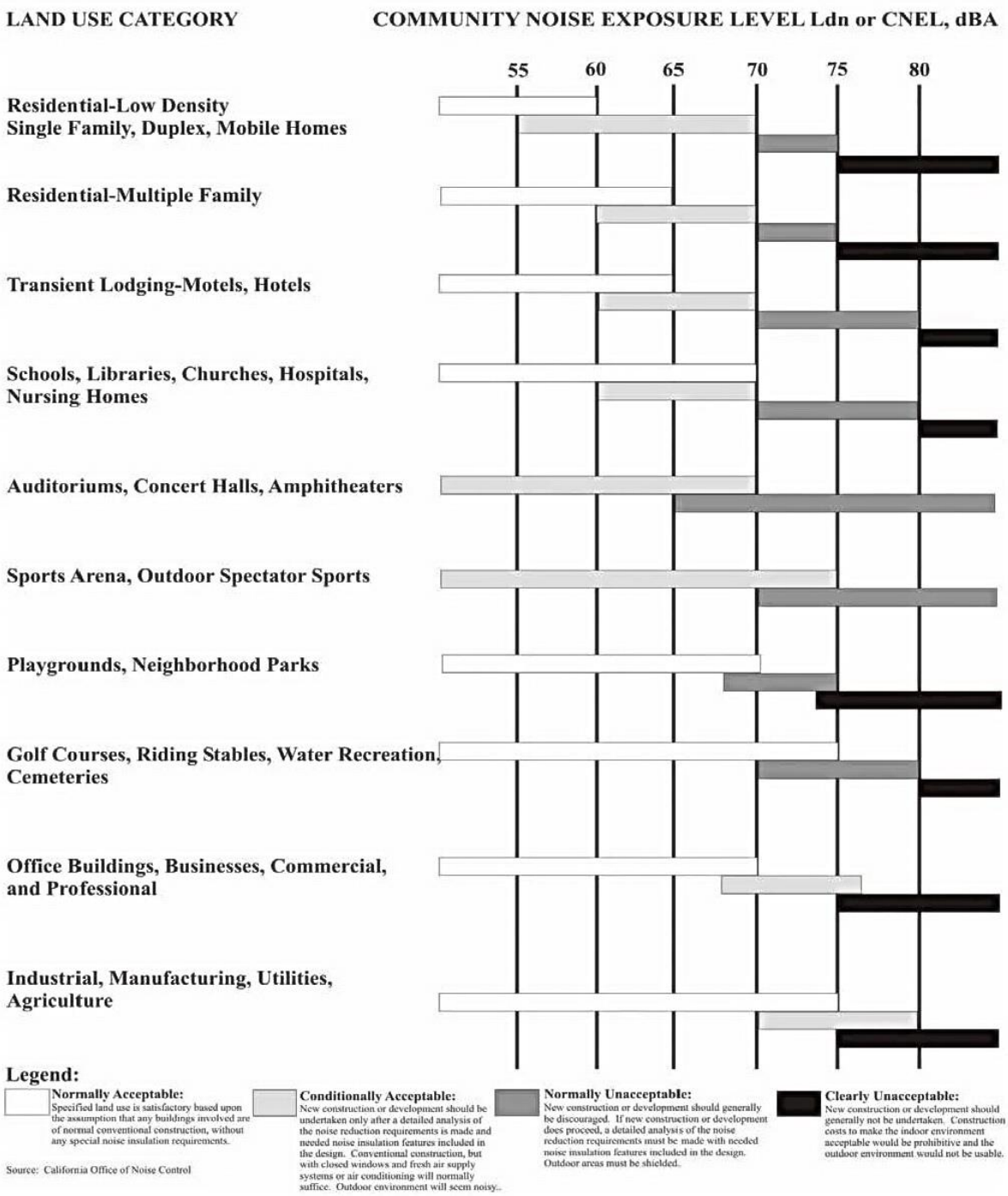
3.3.1 LAND USE COMPATIBILITY

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 land uses, such as the Project, are considered *normally acceptable* with noise levels below 75 dBA CNEL and *conditionally acceptable* with noise levels of less than 80 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 manufacturing, warehousing, wholesale and utilities.

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



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

EXHIBIT 3-B: INTERIOR AND EXTERIOR NOISE STANDARDS

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

[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 describe the potential Project-related operational noise level contributions, this analysis presents the appropriate operational noise standards for both the Cities of San Bernardino and Highland.

3.4.1 CITY OF SAN BERNARDINO

To analyze noise impacts originating from a designated fixed location or private property such as the AGSP, 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 loading dock activity, delivery van activity, roof-top air conditioning units, parking lot vehicle activity, and trash enclosure activity originating from a designated fixed location or private property such as AGSP Development Site, are evaluated against the policies adopted in the City's Development Code. (11)

The Project operational noise impacts are governed by the City of San Bernardino Municipal Code, Section 8.54. 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)). (12) However, due to the Project's close proximity to residential land uses, located north of the Development Site boundary, Development Code, Section 19.20.030.15(A), limits the operational stationary-source noise from Airport Gateway Specific Plan Project to an exterior noise level of 65 dBA L_{eq} for residential land use. (11) The City of San Bernardino Municipal Code noise standards are shown on Table 3-1 and included in Appendix 3.1.

3.4.2 CITY OF HIGHLAND

The currently adopted City of Highland Municipal Code does not identify any quantifiable exterior noise level standards for non-transportation (stationary) noise sources. The 24-hour Community Noise Equivalent Levels (CNEL) outlined in Tables 7.1 and 7.2 in the City of Highland General Plan Noise Element do not reflect the currently adopted Municipal Code Noise Criteria. Therefore, this analysis relies on the City of San Bernardino Development Code noise standards to assess the noise impacts for receivers located within the City of Highland. The currently adopted City of Highland Municipal is included in Appendix 3.2 and the City of Highland General Plan Noise Element is included in Appendix 3.3.

TABLE 3-1: OPERATIONAL NOISE STANDARDS

Jurisdiction	Land Use	Exterior Noise Level Standard (dBA L_{eq})[1]
City of San Bernardino[1]	Residential	65
City of Highland	n/a	n/a

[1] City of San Bernardino Municipal Code, Section 19.20.030.15(A) (Appendix 3.1).
"n/a" = The City of Highland Municipal Code does not identify quantifiable exterior noise level standards for non-transportation noise sources (stationary).

3.5 CONSTRUCTION NOISE STANDARDS

To analyze noise impacts originating from the construction of the Project, noise from construction activities are typically limited to the hours of operation established under a jurisdiction's Municipal Code. Section 8.54.070 the City of San Bernardino Municipal Code, provided in Appendix 3.1, indicates that construction activity is restricted to the hours within 7:00 a.m. and 8:00 p.m. However, neither the General Plan Noise Elements or Municipal Codes for the Cities of San Bernardino and Highland establish numeric maximum acceptable construction source noise levels at potentially affected receivers, which would allow for a quantified determination of what CEQA constitutes a *substantial temporary or permanent increase in ambient noise levels*. Therefore, a numerical construction threshold based on Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual* is used for analysis of daytime construction impacts, as discussed below.

According to the FTA, local noise ordinances are typically not very useful in evaluating construction noise. They usually relate to nuisance and hours of allowed activity, and sometimes specify limits in terms of maximum levels, but are generally not practical for assessing the impact of a construction project. Project construction noise criteria should account for the existing noise environment, the absolute noise levels during construction activities, the duration of the construction, and the adjacent land use. Due to the lack of standardized construction noise thresholds, the FTA provides guidelines that can be considered reasonable criteria for construction noise assessment. The FTA considers a daytime exterior construction noise level of 80 dBA L_{eq} as a reasonable threshold for noise sensitive residential land use. (7 p. 179)

3.6 CONSTRUCTION VIBRATION STANDARDS

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 vibration is generally associated with pile driving and rock blasting. Other construction equipment such as air compressors, light trucks, hydraulic loaders, etc., generates little or no ground vibration. (7)

To analyze vibration impacts originating from the operation and construction of the AGSP, vibration-generating activities are appropriately evaluated against standards established under a City's Municipal Code, if such standards exist. However, the Cities of San Bernardino and Highland do not identify specific vibration level limits and instead this analysis relies on the Caltrans *Transportation and Construction Vibration Guidance Manual*, (13 p. 38) Table 19 and 20,

vibration damage and annoyance criteria are used in this noise study to assess potential temporary construction-related impacts at adjacent receiver locations.

3.6.1 BUILDING DAMAGE:

While ground vibrations from construction activities do not often reach the levels that can damage structures, fragile buildings must receive special consideration. The construction vibration damage potential criteria include consideration of the building conditions. (3 p. 182) Table 3-2 describes the maximum acceptable transient and continuous vibration building damage potential levels by structure type and condition.

TABLE 3-2: BUILDING DAMAGE VIBRATION CRITERIA

Structure and Condition	Maximum Transient Vibration Levels PPV (in/sec)	Maximum Continuous Vibration Levels PPV (in/sec)
Extremely fragile historic buildings	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Caltrans Transportation and Construction Vibration Guidance Manual, April 2020, Table 19, p. 38.

Most of the buildings near the Project site can be described as new residential structures with a maximum acceptable transient building damage vibration threshold of 1.0 PPV (in/sec).

3.6.2 HUMAN ANNOYANCE

For sensitive residential receiver locations, potential annoyance due to construction-related vibration levels is evaluated based on the Caltrans annoyance potential criteria. Table 3-3 describes the maximum acceptable criteria used to describe the transient and continuous sources of vibration. To describe the human annoyance due to construction vibration levels, this analysis relies on the *barely perceptible* maximum transient vibration threshold of 0.04 PPV (in/sec).

TABLE 3-3: HUMAN ANNOYANCE VIBRATION CRITERIA

Human Response	Maximum Transient Vibration Levels PPV (in/sec)	Maximum Continuous Vibration Levels PPV (in/sec)
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.9	0.10
Severe	2.0	0.4

Caltrans Transportation and Construction Vibration Guidance Manual, April 2020, Table 20, p. 38.

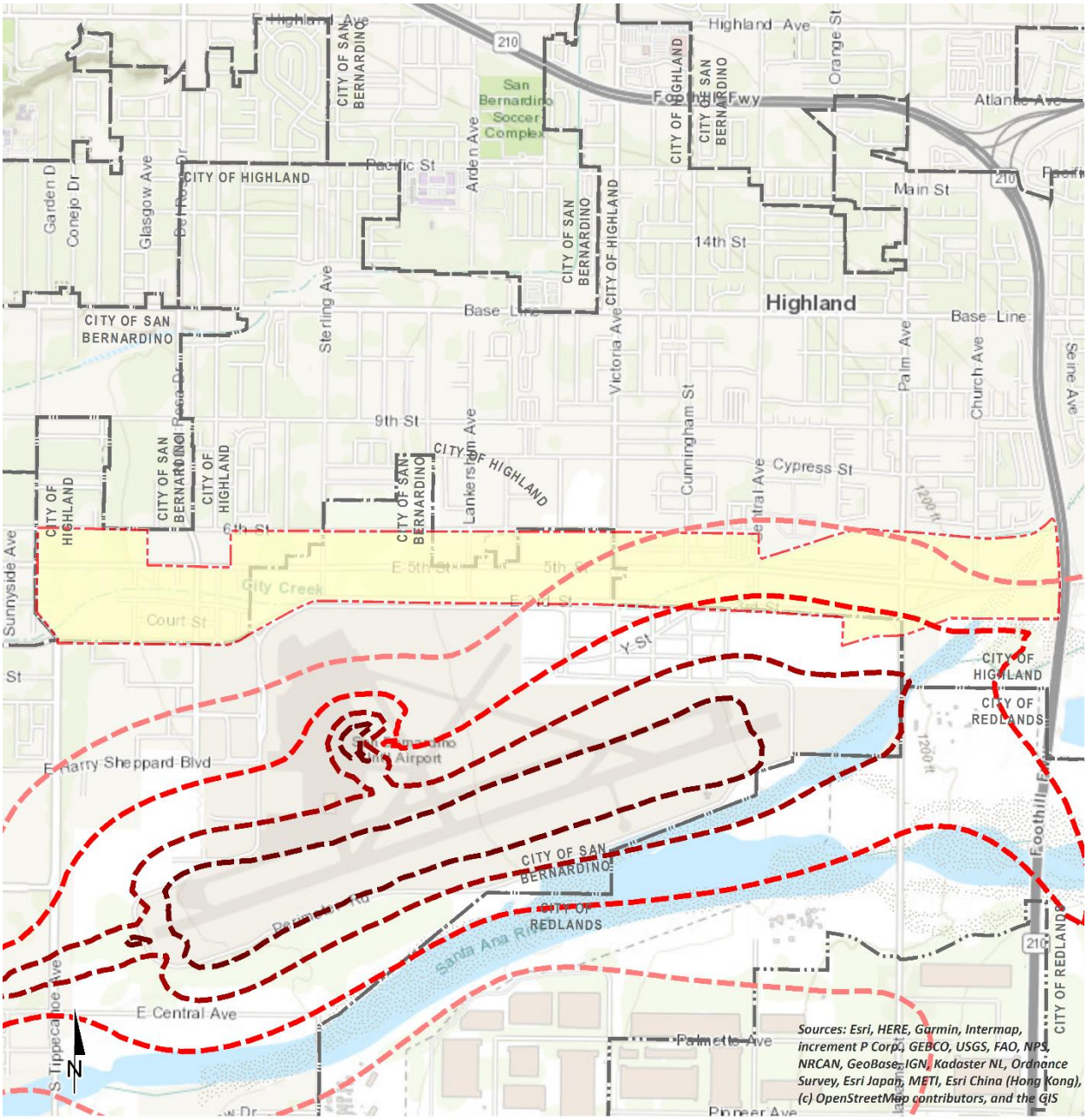
3.7 SAN BERNARDINO INTERNATIONAL AIRPORT (SBIA)

The Airport Gateway Specific Plan is located immediately north of the San Bernardino International Airport (SBIA). This places the Project Site within the SBIA Influence Area. The SBIA was initially built as Norton Air Force Base by the United States Air Force (USAF). Under the Base Realignment and Closure Act of 1990, Norton Air Force base was closed and disposed of by the USAF for a civilian aviation reuse in 1994 and transferred to the San Bernardino International Airport Authority (SBIAA). The SBIAA operates the facility as a public-use general aviation airport that accommodates aircraft ranging from piston-powered propeller aircraft to multi-engine jet aircraft including large air cargo aircraft. (14) The latest aircraft noise contour boundaries for the SBIA were published by the SBIAA on July 2, 2019 as part of the Eastgate Air Cargo Facility Final Environmental Assessment. (14) Figure 4-6 of the Final Environmental Assessment describes the future 2024 Proposed Project CNEL Contours for the SBIA. The future SBIA noise level contours boundaries representing approximately 87,500 annual aircraft operations are shown on Exhibit 3-C.

As shown on Exhibit 3-C the Project industrial land uses are generally located within the 60 to 65 dBA CNEL noise level contours of the SBIA. Therefore, the Project land use is considered *normally acceptable* according to the Cities of San Bernardino and Highland *Land Use Compatibility for Community Noise Exposure* as shown on Exhibit 3-A and must reduce the interior noise levels to 50 dBA L_{eq} to satisfy State of California Green Building Standards (Section 5.507.4.2) previously described in Section 3.2.

Standard building construction practices required under the State of California Green Building Standards Code (CALGreen) typically provide up to 25 dBA of attenuation. With respect to noise generated by the SBIA facilities and activities, application of standard CALGreen construction practices would yield acceptable Project interior noise levels of approximately 45 dBA L_{eq}. In addition, the Project does not propose or require facilities or actions that would contribute to or exacerbate noise generated by SBIA. Therefore, the Project would not be adversely affected by SBIA noise, nor would the Project contribute to or result in adverse airport noise impacts.

EXHIBIT 3-C: SAN BERNARDINO INTERNATIONAL AIRPORT (SBIA) NOISE CONTOURS



LEGEND: ***San Bernardino International (SBD) Airport Future Noise Level Contour Boundaries***

Development Site Boundary | 60 dBA CNEL | 65 dBA CNEL | 70 dBA CNEL | 75 dBA CNEL

Jurisdictional Boundaries

Source: Figure 4-6 of the Eastgate Air Cargo Facility Final Environmental Assessment published by the SBIAA on July 2, 2019.

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4 SIGNIFICANCE CRITERIA

The following significance criteria are based on currently adopted guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1) For the purposes of this report, impacts would be potentially significant if the Project results in or causes:

A. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

B. Generation of excessive ground-borne vibration or ground-borne noise levels?

C. For a project located within the vicinity of a private airstrip or 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, would the project expose people residing or working in the project area to excessive noise levels?

While the Cities of San Bernardino and Highland 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, they do not define the levels at which increases are considered substantial temporary or permanent for use under Guideline A. CEQA Appendix G Guideline C applies to the nearest public and private airports, if any, and the Project's land use compatibility.

4.1 CEQA GUIDELINES NOT FURTHER ANALYZED

As previously indicated in Section 3.6, the SBIA noise contour boundaries are presented on Exhibit 3-C of this report show that the Project is considered *normally acceptable* land use since it is located within the 60 to 65 dBA CNEL dBA CNEL noise level contour boundary and must reduce interior noise levels to 50 dBA L_{eq}. Standard building construction practices required under the State of California Green Building Standards Code (CALGreen) typically provide up to 25 dBA CNEL of attenuation. As such, application of standard CALGreen construction practices would yield acceptable Project interior noise levels of approximately 45 dBA L_{eq}. Since the Project would not be adversely affected by SBIA noise, nor would the Project contribute to or result in adverse airport noise impacts, potential airport noise impacts affecting the Project are therefore not further analyzed.

4.2 NOISE-SENSITIVE RECEIVERS

Noise level increases resulting from the Project are evaluated based on the Appendix G CEQA Guidelines described above at the nearest 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 level increase represents a significant adverse environmental impact. In effect, *there is no single noise increase that renders the noise impact significant.* (15) 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. Since neither the Cities of San Bernardino and Highland General Plan Noise Element or Municipal Code identify any noise level increase thresholds, the substantial noise level increase criteria are derived from the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual.*

To describe the amount to which a given noise level increase (stationary or mobile) is considered acceptable, the FTA criteria is used to evaluate the incremental noise level increase and establishes a method for comparing future project noise with existing ambient conditions under CEQA Significance Threshold A. The amount to which a given noise level increase is considered acceptable is reduced based on existing ambient noise conditions. In effect, the amount to which a given noise level increase is considered acceptable is reduced based on existing ambient noise conditions. Table 4-1 below provides a summary of the allowable criteria used to identify potentially significant incremental noise level increases for off-site and operational noise source activity.

TABLE 4-1: SIGNIFICANCE OF NOISE LEVEL INCREASES

Without Project Noise Level	Potential Significant Impact (dBA CNEL)
< 55 dBA	5 dBA or more
55 - 60 dBA	3 dBA or more
60 - 65 dBA	2 dBA or more
> 65 dBA	1 dBA or more

FTA Transit Noise and Vibration Impact Assessment Manual, 2018 (Table 4-6).

4.3 NON-NOISE-SENSITIVE RECEIVERS

The Cities of San Bernardino and Highland 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. As previously shown on Exhibit 3-A, the *normally acceptable* exterior noise level for non-noise-sensitive land use, such as office, retail and commercial use is 70 dBA CNEL and 75 dBA CNEL for industrial uses.

To determine if Project-related traffic noise level increases are significant at off-site non-noise-sensitive land uses, a *barely perceptible* 3 dBA criteria is used. (4) 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.

4.4 SIGNIFICANCE CRITERIA SUMMARY

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

TABLE 4-2: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Land Use	Condition(s)	Significance Criteria	
			Daytime	Nighttime
Off-Site	Noise-Sensitive[1]	If ambient is < 55 dBA CNEL	≥ 5 dBA CNEL Project increase	
		If ambient is 55 - 60 dBA CNEL	≥ 3 dBA CNEL Project increase	
		If ambient is 60 - 65 dBA CNEL	≥ 2 dBA CNEL Project increase	
		If ambient is > 65 dBA CNEL	≥ 1 dBA CNEL Project increase	
	Non-Noise-Sensitive[2]	if ambient is > 70 dBA CNEL	≥ 3 dBA CNEL Project increase	
Operational	Noise-Sensitive[1]	Exterior Noise Level Limit[3]	65 dBA L_{eq}	
		If ambient is < 55 dBA L_{eq}	≥ 5 dBA L_{eq} Project increase	
		If ambient is 55 - 60 dBA L_{eq}	≥ 3 dBA L_{eq} Project increase	
		If ambient is 60 - 65 dBA L_{eq}	≥ 2 dBA L_{eq} Project increase	
		If ambient is > 65 dBA L_{eq}	≥ 1 dBA L_{eq} Project increase	
	Non-Noise-Sensitive[2]	if ambient is > 70 dBA CNEL	≥ 3 dBA CNEL Project increase	
Construction	Noise-Sensitive	Restricted to the hours within 7:00 a.m. and 8:00 p.m.[4]		
		Noise Level Threshold[1]	80 dBA L_{eq}	n/a
		Building Damage Vibration Threshold[5]	1.0 PPV (in/sec)	
		Human Annoyance Vibration Threshold[5]	0.04 PPV (in/sec)	

[1] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, 2018.
[2] City of San Bernardino General Plan Noise Element, Figure N-1.
[3] City of San Bernardino Development Code, Section 19.20.030.15(A) (Appendix 3.1).
[4] Section 8.54.070 of the City of San Bernardino Municipal Code (Appendix 3.1).
[5] Caltrans Transportation and Construction Vibration Guidance Manual, April 2020, Tables 19 & 20, p. 38.
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

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5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, 24-hour noise level measurements were taken at eight 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, September 9th, 2020. 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. (16)

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 every 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*. (2) Further, FTA guidance states, t*hat 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*. (7)

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. (7) 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 (L_{eq}). The equivalent sound level (L_{eq}) 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.

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

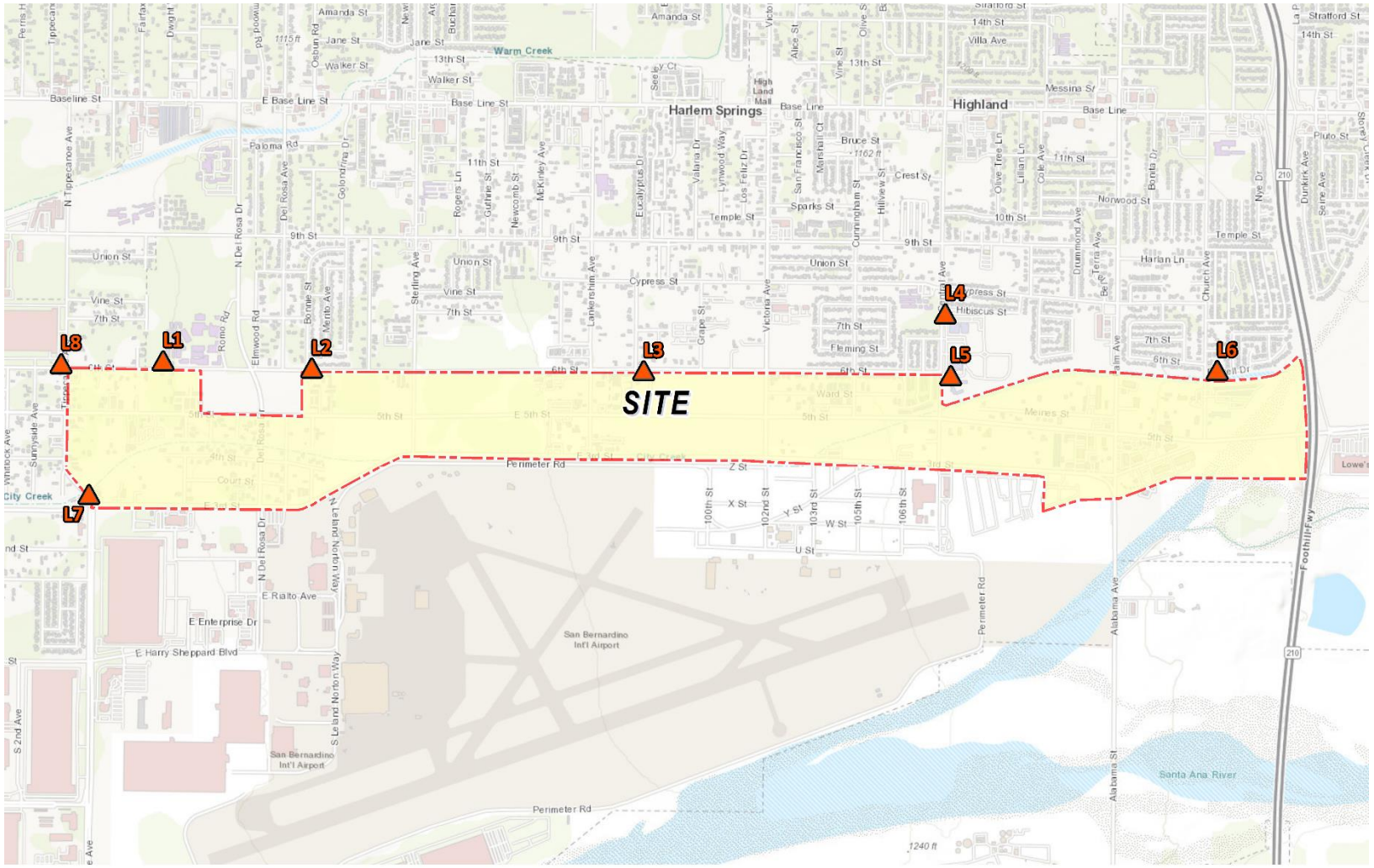
Location[1]	Description	Energy Average Noise Level (dBA L_{eq})[2]		CNEL
		Daytime	Nighttime	
L1	Located north of the Project site in Indian Springs High School at 650 N Del Rosa Drive.	57.7	54.9	62.3
L2	Located north of the Project site on 6th Street near existing single family residential home at 7891 Bonnie Street.	64.2	59.1	67.2
L3	Located north of the Project site on 6th Street near existing single-family residential home at 7904 Roberts Street.	60.5	57.2	64.7
L4	Located north of the Project site on Central Avenue near the Highland Family YMCA at 7793 Central Avenue.	61.4	58.6	66.1
L5	Located north of the Project site by the Highland Branch Library at 7863 Central Avenue.	51.9	48.4	56.0
L6	Located northeast of the Project site on Powell Drive near existing single-family residential home at 7885 Church Avenue.	58.5	57.1	63.9
L7	Located southwest of the Project site on Tippecanoe Avenue across from Trinity Christian Fellowship Church at 8174 Tippecanoe Avenue.	70.6	68.8	75.8
L8	Located northwest of the Project site on 6th Street and Tippecanoe Avenue.	64.4	61.6	68.8

[1] See Exhibit 5-A and 5-B for the noise level measurement locations.
[2] Energy (logarithmic) average 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.

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, L_1, L_2, L_5, L_8, L_{25}, L_{50}, L_{90}, L_{95}, and L_{99} 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 surface streets. This includes the auto and heavy truck activities on study area roadway segments near the noise level measurement locations. The 24-hour existing noise level measurement results are shown on Table 5-1.

EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS



LEGEND:

N

▲ Measurement Locations

6 TRAFFIC NOISE PREDICTION METHODS AND PROCEDURES

The following section outlines the methods and procedures used to model and analyze the future off-site 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. (17) 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. (18) 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. (19)

6.2 OFF-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

Table 6-1 presents the roadway parameters used to assess the Project's off-site dBA CNEL transportation noise impacts. Table 6-1 identifies the 39 study area roadway segments, the distance from the centerline to adjacent land use based on the functional roadway classifications per the City of San Bernardino and City of Highland General Plan Circulation Element, and the posted vehicle speeds. The ADT volumes used in this study area presented on Table 6-2 are based on *Airport Gateway Specific Plan Traffic Impact Study*, prepared by Kimley-Horn and Associates, Inc. for the following traffic scenarios under both Without and With Project conditions: Existing, and Future Build-Out 2040. (20)

The ADT volumes vary for each roadway segment based on the existing traffic volumes and the combination of project traffic distributions. This analysis relies on a comparative evaluation of the off-site traffic noise impacts, without and with project ADT traffic volumes from the Project traffic study.

TABLE 6-1: OFF-SITE ROADWAY PARAMETERS

ID	Roadway	Segment	Receiving Land Use[1]	Classification[2]	Centerline Distance to Receiving Land Use (Feet)[3]	Vehicle Speed (mph)
1	Waterman Avenue	Baseline Street to 5th Street	Sensitive	Major Arterial	50'	40
2	Waterman Avenue	5th Street to 3rd Street	Non-Sensitive	Major Arterial	50'	40
3	Tippecanoe Avenue	Baseline Street to 6th Street	Sensitive	Secondary Arterial	44'	45
4	Tippecanoe Avenue	6th Street to 3rd Street	Sensitive	Secondary Arterial	44'	45
5	Tippecanoe Avenue	3rd Street to Mill Street	Sensitive	Major Arterial	50'	45
6	Tippecanoe Avenue	Mill Street to Orange Show Road /San Bernardino Avenue	Sensitive	Major Arterial	50'	45
7	Tippecanoe Avenue	Orange Show Road/ San Bernardino Avenue to Harriman Place / I-10 WB Ramps	Sensitive	Major Arterial	50'	45
8	Del Rosa Drive	SR-210 EB Ramps to Highland Avenue	Sensitive	Major Arterial	50'	45
9	Del Rosa Drive	Highland Avenue to Pacific Street	Sensitive	Major Arterial	33'	35
10	Del Rosa Drive	Pacific Street to Baseline Street	Sensitive	Major Arterial	50'	45
11	Del Rosa Drive	Baseline Street to 9th Street	Sensitive	Major Arterial	50'	45
12	Del Rosa Drive	9th Street to 6th Street	Sensitive	Major Arterial	50'	45
13	Del Rosa Drive	6th Street to 3rd Street	Sensitive	Major Arterial	50'	45
14	Sterling Avenue	Base Line to 9th Street	Sensitive	Major Arterial	50'	40
15	Sterling Avenue	9th Street to 6th Street	Sensitive	Major Arterial	50'	40
16	Sterling Avenue	6th Street to 3rd Street	Sensitive	Major Arterial	50'	40
17	Victoria Avenue	Highland Avenue to Pacific Street	Sensitive	Secondary Arterial	44'	40
18	Victoria Avenue	Pacific Street to Base Line	Sensitive	Secondary Arterial	44'	40
19	Victoria Avenue	Base Line to 9th Street	Sensitive	Secondary Arterial	44'	45
20	Victoria Avenue	9th Street to 6th Street	Sensitive	Secondary Arterial	44'	45
21	Victoria Avenue	6th Street to 3rd Street	Sensitive	Secondary Arterial	44'	45
22	6th Street	Tippecanoe Avenue to Del Rosa Drive	Sensitive	Collector	30'	40

ID	Roadway	Segment	Receiving Land Use[1]	Classification[2]	Centerline Distance to Receiving Land Use (Feet)[3]	Vehicle Speed (mph)
23	6th Street	Del Rosa Drive to Sterling Avenue	Sensitive	Collector	30'	40
24	6th Street	Sterling Avenue to Victoria Avenue	Sensitive	Collector	30'	40
25	6th Street	Victoria Avenue to Central Avenue	Sensitive	Collector	30'	40
26	5th Street	I-215 NB Ramps to E Street	Sensitive	Major Arterial	50'	45
27	5th Street	E Street to Waterman Avenue	Sensitive	Major Arterial	50'	45
28	5th Street	Waterman Avenue to Tippecanoe Avenue	Sensitive	Major Arterial	33'	45
29	5th Street	Tippecanoe Avenue to Del Rosa Drive	Sensitive	Major Arterial	33'	45
30	5th Street	Del Rosa Drive to Sterling Avenue	Sensitive	Major Arterial	50'	45
31	5th Street	Sterling Avenue to Victoria Avenue	Sensitive	Major Arterial	33'	45
32	5th Street	Victoria Avenue to Central Avenue	Sensitive	Major Arterial	50'	45
33	5th Street	Central Avenue to Palm Avenue	Sensitive	Major Arterial	50'	45
34	5th Street	Palm Avenue to SR-210 EB Ramps	Non-Sensitive	Major Arterial	50'	45
35	3rd Street	Waterman Avenue to Tippecanoe Avenue	Sensitive	Major Arterial	50'	45
36	3rd Street	Tippecanoe Avenue to Del Rosa Drive	Sensitive	Major Arterial	50'	45
37	3rd Street	Del Rosa Drive to Sterling Avenue	Sensitive	Major Arterial	50'	45
38	3rd Street	Sterling Avenue to Victoria Avenue	Sensitive	Major Arterial	50'	45
39	3rd Street	Victoria Avenue to Palm Avenue	Sensitive	Major Arterial	50'	45

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] City of San Bernardino Circulation Project Figure 3-11a and City of Highland Circulation Element Figure 3-12a.
[3] Based upon the right-of-way distances for each roadway classification provided in the General Plan Circulation Element.

Table 6-3 provides the time of day (daytime, evening, and nighttime) vehicle splits. The daily Project truck trip-ends were assigned to the individual off-site study area roadway segments based on the Project truck trip distribution percentages documented in the *Traffic Impact Study*. 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 6-4 shows the traffic flow by vehicle type (vehicle mix) used for all without Project traffic scenarios.

TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic Volumes[1]			
			Existing		Future Build-Out 2040	
			Without Project	With Project	Without Project	With Project
1	Waterman Avenue	Baseline Street to 5th Street	25,741	26,062	28,982	29,303
2	Waterman Avenue	5th Street to 3rd Street	27,528	28,232	31,551	32,255
3	Tippecanoe Avenue	Baseline Street to 6th Street	12,006	13,152	19,291	20,437
4	Tippecanoe Avenue	6th Street to 3rd Street	14,330	19,390	16,328	21,388
5	Tippecanoe Avenue	3rd Street to Mill Street	28,362	38,124	43,928	53,690
6	Tippecanoe Avenue	Mill Street to Orange Show Road /San Bernardino Avenue	32,591	42,353	47,921	57,683
7	Tippecanoe Avenue	Orange Show Road/ San Bernardino Avenue to Harriman Place / I-10 WB Ramps	25,471	35,233	29,159	38,921
8	Del Rosa Drive	SR-210 EB Ramps to Highland Avenue	23,780	26,080	26,238	28,538
9	Del Rosa Drive	Highland Avenue to Pacific Street	17,645	19,945	19,585	21,885
10	Del Rosa Drive	Pacific Street to Baseline Street	12,318	14,618	15,318	17,618
11	Del Rosa Drive	Baseline Street to 9th Street	9,963	16,471	12,139	18,647
12	Del Rosa Drive	9th Street to 6th Street	9,871	16,379	12,294	18,802
13	Del Rosa Drive	6th Street to 3rd Street	9,576	11,560	12,774	14,758
14	Sterling Avenue	Base Line to 9th Street	13,368	16,806	13,433	16,871
15	Sterling Avenue	9th Street to 6th Street	10,609	12,775	14,385	16,551
16	Sterling Avenue	6th Street to 3rd Street	6,984	14,366	11,619	19,001
17	Victoria Avenue	Highland Avenue to Pacific Street	12,184	16,944	26,114	30,874
18	Victoria Avenue	Pacific Street to Base Line	14,431	19,687	17,643	22,899
19	Victoria Avenue	Base Line to 9th Street	11,210	16,466	13,063	18,319
20	Victoria Avenue	9th Street to 6th Street	8,368	13,624	10,302	15,558
21	Victoria Avenue	6th Street to 3rd Street	8,368	9,436	12,525	13,593
22	6th Street	Tippecanoe Avenue to Del Rosa Drive	3,249	4,491	5,359	6,601
23	6th Street	Del Rosa Drive to Sterling Avenue	4,714	7,674	7,501	10,461
24	6th Street	Sterling Avenue to Victoria Avenue	3,519	10,051	8,278	14,810
25	6th Street	Victoria Avenue to Central Avenue	4,047	10,918	5,844	12,715

ID	Roadway	Segment	Average Daily Traffic Volumes[1]			
			Existing		Future Build-Out 2040	
			Without Project	With Project	Without Project	With Project
26	5th Street	I-215 NB Ramps to E Street	30,975	43,371	37,481	49,877
27	5th Street	E Street to Waterman Avenue	20,083	32,479	22,657	35,053
28	5th Street	Waterman Avenue to Tippecanoe Avenue	9,167	22,329	13,621	26,783
29	5th Street	Tippecanoe Avenue to Del Rosa Drive	8,725	23,858	14,297	29,430
30	5th Street	Del Rosa Drive to Sterling Avenue	5,595	26,122	10,664	31,191
31	5th Street	Sterling Avenue to Victoria Avenue	3,911	25,904	8,476	30,469
32	5th Street	Victoria Avenue to Central Avenue	9,939	32,258	11,954	34,273
33	5th Street	Central Avenue to Palm Avenue	9,939	35,031	11,912	37,004
34	5th Street	Palm Avenue to SR-210 EB Ramps	26,098	52,097	33,870	59,869
35	3rd Street	Waterman Avenue to Tippecanoe Avenue	10,460	11,686	13,621	14,847
36	3rd Street	Tippecanoe Avenue to Del Rosa Drive	15,620	27,119	19,594	31,093
37	3rd Street	Del Rosa Drive to Sterling Avenue	18,143	28,583	34,523	44,963
38	3rd Street	Sterling Avenue to Victoria Avenue	13,457	19,662	21,178	27,383
39	3rd Street	Victoria Avenue to Palm Avenue	10,714	17,123	18,390	24,799

[1] Traffic Impact Study for the Airport Gateway Specific Plan Project, Kimley-Horn and Associates, Inc.

TABLE 6-3: TIME OF DAY VEHICLE SPLITS

Vehicle Type	Time of Day Splits[1]			Total of Time of Day Splits
	Daytime	Evening	Nighttime	
Autos	77.50%	12.90%	9.60%	100.00%
Medium Trucks	84.80%	4.90%	10.30%	100.00%
Heavy Trucks	86.50%	2.70%	10.80%	100.00%

[1] Typical Southern California vehicle mix.
"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.

TABLE 6-4: WITHOUT PROJECT VEHICLE MIX

Classification	Total % Traffic Flow			Total
	Autos	Medium Trucks	Heavy Trucks	
All Segments	97.86%	1.28%	0.86%	100.00%

Based on an existing vehicle count taken at Tippecanoe Avenue and 5th Street (Traffic Impact Study for the Airport Gateway Specific Plan, Kimley-Horn and Associates, Inc.). Vehicle mix percentage values rounded to the nearest one-hundredth.

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7 OFF-SITE TRAFFIC NOISE IMPACTS

To assess the off-site transportation CNEL noise level impacts associated with the proposed Project, noise contours were developed based on *Airport Gateway Specific Plan Traffic Impact Study*. (20) Noise contour boundaries represent the equal levels of noise exposure and are measured in CNEL from the center of the roadway.

7.1 TRAFFIC NOISE CONTOURS

Noise contours were used to assess the Project's incremental 24-hour dBA CNEL 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 CNEL 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 7-4 present a summary of the exterior dBA CNEL traffic noise levels without barrier attenuation. Roadway segments are analyzed from the without Project to the with Project conditions in each of the following timeframes: Existing and Future Build-Out 2040. Appendix 7.1 includes a summary of the dBA CNEL traffic noise level contours for each of the traffic scenarios.

TABLE 7-1: EXISTING WITHOUT PROJECT NOISE CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Waterman Avenue	Baseline Street to 5th Street	Sensitive	69.5	RW	99	214
2	Waterman Avenue	5th Street to 3rd Street	Non-Sensitive	71.4	62	135	290
3	Tippecanoe Avenue	Baseline Street to 6th Street	Sensitive	68.3	RW	73	156
4	Tippecanoe Avenue	6th Street to 3rd Street	Sensitive	69.0	RW	82	176
5	Tippecanoe Avenue	3rd Street to Mill Street	Sensitive	72.8	77	166	359
6	Tippecanoe Avenue	Mill Street to Orange Show Road /San Bernardino Avenue	Sensitive	71.8	66	141	304
7	Tippecanoe Avenue	Orange Show Road/ San Bernardino Avenue to Harriman Place / I-10 WB Ramps	Sensitive	72.4	72	155	334
8	Del Rosa Drive	SR-210 EB Ramps to Highland Avenue	Sensitive	70.4	53	114	247
9	Del Rosa Drive	Highland Avenue to Pacific Street	Sensitive	69.0	RW	61	132
10	Del Rosa Drive	Pacific Street to Baseline Street	Sensitive	67.5	RW	74	159
11	Del Rosa Drive	Baseline Street to 9th Street	Sensitive	66.6	RW	64	138
12	Del Rosa Drive	9th Street to 6th Street	Sensitive	66.6	RW	64	137
13	Del Rosa Drive	6th Street to 3rd Street	Sensitive	66.4	RW	62	134
14	Sterling Avenue	Base Line to 9th Street	Sensitive	66.6	RW	64	138
15	Sterling Avenue	9th Street to 6th Street	Sensitive	65.6	RW	55	119
16	Sterling Avenue	6th Street to 3rd Street	Sensitive	63.8	RW	RW	90
17	Victoria Avenue	Highland Avenue to Pacific Street	Sensitive	67.1	RW	60	130
18	Victoria Avenue	Pacific Street to Base Line	Sensitive	67.8	RW	68	146
19	Victoria Avenue	Base Line to 9th Street	Sensitive	68.0	RW	69	149
20	Victoria Avenue	9th Street to 6th Street	Sensitive	66.7	RW	57	123
21	Victoria Avenue	6th Street to 3rd Street	Sensitive	66.7	RW	57	123
22	6th Street	Tippecanoe Avenue to Del Rosa Drive	Sensitive	63.9	RW	RW	55

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
23	6th Street	Del Rosa Drive to Sterling Avenue	Sensitive	65.5	RW	33	70
24	6th Street	Sterling Avenue to Victoria Avenue	Sensitive	64.3	RW	RW	58
25	6th Street	Victoria Avenue to Central Avenue	Sensitive	64.9	RW	RW	63
26	5th Street	I-215 NB Ramps to E Street	Sensitive	71.5	63	136	294
27	5th Street	E Street to Waterman Avenue	Sensitive	69.7	RW	102	220
28	5th Street	Waterman Avenue to Tippecanoe Avenue	Sensitive	68.8	RW	59	128
29	5th Street	Tippecanoe Avenue to Del Rosa Drive	Sensitive	68.6	RW	57	124
30	5th Street	Del Rosa Drive to Sterling Avenue	Sensitive	64.1	RW	RW	94
31	5th Street	Sterling Avenue to Victoria Avenue	Sensitive	65.1	RW	34	73
32	5th Street	Victoria Avenue to Central Avenue	Sensitive	66.6	RW	64	138
33	5th Street	Central Avenue to Palm Avenue	Sensitive	66.6	RW	64	138
34	5th Street	Palm Avenue to SR-210 EB Ramps	Non-Sensitive	70.8	57	122	262
35	3rd Street	Waterman Avenue to Tippecanoe Avenue	Sensitive	66.8	RW	66	143
36	3rd Street	Tippecanoe Avenue to Del Rosa Drive	Sensitive	68.6	RW	86	186
37	3rd Street	Del Rosa Drive to Sterling Avenue	Sensitive	69.2	RW	96	206
38	3rd Street	Sterling Avenue to Victoria Avenue	Sensitive	67.9	RW	78	169
39	3rd Street	Victoria Avenue to Palm Avenue	Sensitive	66.9	31	67	145

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.

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

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

TABLE 7-2: EXISTING WITH PROJECT NOISE CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Waterman Avenue	Baseline Street to 5th Street	Sensitive	69.5	RW	100	216
2	Waterman Avenue	5th Street to 3rd Street	Non-Sensitive	71.6	64	137	295
3	Tippecanoe Avenue	Baseline Street to 6th Street	Sensitive	68.7	RW	77	166
4	Tippecanoe Avenue	6th Street to 3rd Street	Sensitive	70.3	46	100	215
5	Tippecanoe Avenue	3rd Street to Mill Street	Sensitive	74.1	94	203	437
6	Tippecanoe Avenue	Mill Street to Orange Show Road /San Bernardino Avenue	Sensitive	72.9	78	168	362
7	Tippecanoe Avenue	Orange Show Road/ San Bernardino Avenue to Harriman Place / I-10 WB Ramps	Sensitive	73.8	89	192	414
8	Del Rosa Drive	SR-210 EB Ramps to Highland Avenue	Sensitive	70.8	56	122	262
9	Del Rosa Drive	Highland Avenue to Pacific Street	Sensitive	69.6	RW	66	143
10	Del Rosa Drive	Pacific Street to Baseline Street	Sensitive	68.3	RW	83	178
11	Del Rosa Drive	Baseline Street to 9th Street	Sensitive	68.8	RW	90	193
12	Del Rosa Drive	9th Street to 6th Street	Sensitive	68.8	RW	89	192
13	Del Rosa Drive	6th Street to 3rd Street	Sensitive	67.3	RW	71	152
14	Sterling Avenue	Base Line to 9th Street	Sensitive	67.6	RW	75	161
15	Sterling Avenue	9th Street to 6th Street	Sensitive	66.4	RW	62	134
16	Sterling Avenue	6th Street to 3rd Street	Sensitive	66.9	RW	67	145
17	Victoria Avenue	Highland Avenue to Pacific Street	Sensitive	68.5	RW	75	162
18	Victoria Avenue	Pacific Street to Base Line	Sensitive	69.1	RW	83	179
19	Victoria Avenue	Base Line to 9th Street	Sensitive	69.6	RW	90	193
20	Victoria Avenue	9th Street to 6th Street	Sensitive	68.8	RW	79	170
21	Victoria Avenue	6th Street to 3rd Street	Sensitive	67.2	RW	62	133
22	6th Street	Tippecanoe Avenue to Del Rosa Drive	Sensitive	65.3	RW	31	68

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
23	6th Street	Del Rosa Drive to Sterling Avenue	Sensitive	67.6	RW	45	97
24	6th Street	Sterling Avenue to Victoria Avenue	Sensitive	68.8	RW	54	116
25	6th Street	Victoria Avenue to Central Avenue	Sensitive	69.2	RW	57	123
26	5th Street	I-215 NB Ramps to E Street	Sensitive	73.0	79	171	368
27	5th Street	E Street to Waterman Avenue	Sensitive	71.7	65	141	303
28	5th Street	Waterman Avenue to Tippecanoe Avenue	Sensitive	72.7	50	108	232
29	5th Street	Tippecanoe Avenue to Del Rosa Drive	Sensitive	73.0	52	112	242
30	5th Street	Del Rosa Drive to Sterling Avenue	Sensitive	70.8	57	122	262
31	5th Street	Sterling Avenue to Victoria Avenue	Sensitive	73.3	55	119	256
32	5th Street	Victoria Avenue to Central Avenue	Sensitive	71.7	65	140	302
33	5th Street	Central Avenue to Palm Avenue	Sensitive	72.1	69	148	319
34	5th Street	Palm Avenue to SR-210 EB Ramps	Non-Sensitive	73.8	90	193	416
35	3rd Street	Waterman Avenue to Tippecanoe Avenue	Sensitive	67.3	RW	71	154
36	3rd Street	Tippecanoe Avenue to Del Rosa Drive	Sensitive	71.0	58	125	269
37	3rd Street	Del Rosa Drive to Sterling Avenue	Sensitive	71.2	60	129	279
38	3rd Street	Sterling Avenue to Victoria Avenue	Sensitive	69.6	RW	101	217
39	3rd Street	Victoria Avenue to Palm Avenue	Sensitive	69.0	RW	92	198

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.

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

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

TABLE 7-3: FUTURE BUILD-OUT 2040 WITHOUT PROJECT NOISE CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Waterman Avenue	Baseline Street to 5th Street	Sensitive	70.0	50	108	232
2	Waterman Avenue	5th Street to 3rd Street	Non-Sensitive	72.0	68	147	317
3	Tippecanoe Avenue	Baseline Street to 6th Street	Sensitive	70.3	46	99	214
4	Tippecanoe Avenue	6th Street to 3rd Street	Sensitive	69.6	RW	89	192
5	Tippecanoe Avenue	3rd Street to Mill Street	Sensitive	74.7	103	223	480
6	Tippecanoe Avenue	Mill Street to Orange Show Road /San Bernardino Avenue	Sensitive	73.4	85	183	393
7	Tippecanoe Avenue	Orange Show Road/ San Bernardino Avenue to Harriman Place / I-10 WB Ramps	Sensitive	73.0	79	170	365
8	Del Rosa Drive	SR-210 EB Ramps to Highland Avenue	Sensitive	70.8	57	122	263
9	Del Rosa Drive	Highland Avenue to Pacific Street	Sensitive	69.5	RW	66	141
10	Del Rosa Drive	Pacific Street to Baseline Street	Sensitive	68.5	RW	85	184
11	Del Rosa Drive	Baseline Street to 9th Street	Sensitive	67.5	RW	73	157
12	Del Rosa Drive	9th Street to 6th Street	Sensitive	67.5	RW	74	159
13	Del Rosa Drive	6th Street to 3rd Street	Sensitive	67.7	RW	76	163
14	Sterling Avenue	Base Line to 9th Street	Sensitive	66.7	RW	64	139
15	Sterling Avenue	9th Street to 6th Street	Sensitive	67.0	RW	67	145
16	Sterling Avenue	6th Street to 3rd Street	Sensitive	66.0	RW	59	126
17	Victoria Avenue	Highland Avenue to Pacific Street	Sensitive	70.4	47	100	216
18	Victoria Avenue	Pacific Street to Base Line	Sensitive	68.7	RW	77	167
19	Victoria Avenue	Base Line to 9th Street	Sensitive	68.6	RW	77	165
20	Victoria Avenue	9th Street to 6th Street	Sensitive	67.6	RW	65	141
21	Victoria Avenue	6th Street to 3rd Street	Sensitive	68.4	RW	75	161
22	6th Street	Tippecanoe Avenue to Del Rosa Drive	Sensitive	66.1	RW	35	76

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
23	6th Street	Del Rosa Drive to Sterling Avenue	Sensitive	67.5	RW	44	95
24	6th Street	Sterling Avenue to Victoria Avenue	Sensitive	68.0	RW	47	102
25	6th Street	Victoria Avenue to Central Avenue	Sensitive	66.5	RW	38	81
26	5th Street	I-215 NB Ramps to E Street	Sensitive	72.4	72	155	334
27	5th Street	E Street to Waterman Avenue	Sensitive	70.2	51	111	239
28	5th Street	Waterman Avenue to Tippecanoe Avenue	Sensitive	70.6	36	77	167
29	5th Street	Tippecanoe Avenue to Del Rosa Drive	Sensitive	70.8	37	80	172
30	5th Street	Del Rosa Drive to Sterling Avenue	Sensitive	66.9	RW	67	144
31	5th Street	Sterling Avenue to Victoria Avenue	Sensitive	68.5	RW	56	121
32	5th Street	Victoria Avenue to Central Avenue	Sensitive	67.4	RW	72	156
33	5th Street	Central Avenue to Palm Avenue	Sensitive	67.4	RW	72	155
34	5th Street	Palm Avenue to SR-210 EB Ramps	Non-Sensitive	71.9	67	145	312
35	3rd Street	Waterman Avenue to Tippecanoe Avenue	Sensitive	68.0	RW	79	170
36	3rd Street	Tippecanoe Avenue to Del Rosa Drive	Sensitive	69.6	RW	101	217
37	3rd Street	Del Rosa Drive to Sterling Avenue	Sensitive	72.0	68	147	316
38	3rd Street	Sterling Avenue to Victoria Avenue	Sensitive	69.9	RW	106	228
39	3rd Street	Victoria Avenue to Palm Avenue	Sensitive	69.3	RW	96	208

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.

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

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

TABLE 7-4: FUTURE BUILD-OUT 2040 WITH PROJECT NOISE CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Waterman Avenue	Baseline Street to 5th Street	Sensitive	70.0	50	108	234
2	Waterman Avenue	5th Street to 3rd Street	Non-Sensitive	72.1	69	150	322
3	Tippecanoe Avenue	Baseline Street to 6th Street	Sensitive	70.6	48	103	223
4	Tippecanoe Avenue	6th Street to 3rd Street	Sensitive	70.8	49	107	230
5	Tippecanoe Avenue	3rd Street to Mill Street	Sensitive	75.6	118	255	549
6	Tippecanoe Avenue	Mill Street to Orange Show Road /San Bernardino Avenue	Sensitive	74.2	96	207	445
7	Tippecanoe Avenue	Orange Show Road/ San Bernardino Avenue to Harriman Place / I-10 WB Ramps	Sensitive	74.2	95	206	443
8	Del Rosa Drive	SR-210 EB Ramps to Highland Avenue	Sensitive	71.2	60	129	278
9	Del Rosa Drive	Highland Avenue to Pacific Street	Sensitive	70.0	33	71	152
10	Del Rosa Drive	Pacific Street to Baseline Street	Sensitive	69.1	RW	94	202
11	Del Rosa Drive	Baseline Street to 9th Street	Sensitive	69.3	RW	97	210
12	Del Rosa Drive	9th Street to 6th Street	Sensitive	69.4	RW	98	211
13	Del Rosa Drive	6th Street to 3rd Street	Sensitive	68.3	RW	83	179
14	Sterling Avenue	Base Line to 9th Street	Sensitive	67.6	RW	75	162
15	Sterling Avenue	9th Street to 6th Street	Sensitive	67.6	RW	74	160
16	Sterling Avenue	6th Street to 3rd Street	Sensitive	68.2	RW	81	175
17	Victoria Avenue	Highland Avenue to Pacific Street	Sensitive	71.1	52	112	242
18	Victoria Avenue	Pacific Street to Base Line	Sensitive	69.8	RW	92	198
19	Victoria Avenue	Base Line to 9th Street	Sensitive	70.1	45	96	207
20	Victoria Avenue	9th Street to 6th Street	Sensitive	69.4	RW	86	186
21	Victoria Avenue	6th Street to 3rd Street	Sensitive	68.8	RW	79	170
22	6th Street	Tippecanoe Avenue to Del Rosa Drive	Sensitive	67.0	RW	41	88

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
23	6th Street	Del Rosa Drive to Sterling Avenue	Sensitive	69.0	RW	55	119
24	6th Street	Sterling Avenue to Victoria Avenue	Sensitive	70.5	32	70	150
25	6th Street	Victoria Avenue to Central Avenue	Sensitive	69.8	RW	63	136
26	5th Street	I-215 NB Ramps to E Street	Sensitive	73.6	87	187	404
27	5th Street	E Street to Waterman Avenue	Sensitive	72.1	69	148	319
28	5th Street	Waterman Avenue to Tippecanoe Avenue	Sensitive	73.5	56	121	262
29	5th Street	Tippecanoe Avenue to Del Rosa Drive	Sensitive	73.9	60	129	279
30	5th Street	Del Rosa Drive to Sterling Avenue	Sensitive	71.6	64	137	295
31	5th Street	Sterling Avenue to Victoria Avenue	Sensitive	74.0	61	132	285
32	5th Street	Victoria Avenue to Central Avenue	Sensitive	72.0	68	146	315
33	5th Street	Central Avenue to Palm Avenue	Sensitive	72.3	71	154	331
34	5th Street	Palm Avenue to SR-210 EB Ramps	Non-Sensitive	74.4	98	212	456
35	3rd Street	Waterman Avenue to Tippecanoe Avenue	Sensitive	68.3	RW	84	180
36	3rd Street	Tippecanoe Avenue to Del Rosa Drive	Sensitive	71.6	64	137	295
37	3rd Street	Del Rosa Drive to Sterling Avenue	Sensitive	73.2	81	175	377
38	3rd Street	Sterling Avenue to Victoria Avenue	Sensitive	71.0	58	126	271
39	3rd Street	Victoria Avenue to Palm Avenue	Sensitive	70.6	55	118	254

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.

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

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

7.2 EXISTING WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

An analysis of existing traffic noise levels plus traffic noise generated by the proposed Project has been included in this report to fully analyze all the existing traffic scenarios identified in *Airport Gateway Specific Plan Traffic Impact Study*. This condition is provided solely for informational purposes and will not occur, since the Project will not be fully developed and occupied under Existing conditions. Table 7-1 shows the Existing without Project conditions CNEL noise levels. The Existing without Project exterior noise levels are expected to range from 63.8 to 72.8 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 65.3 to 74.1 dBA CNEL. Table 7-5 shows that the Project off-site traffic noise level impacts will range from 0.0 to 8.2 dBA CNEL. Based on the significance criteria for off-site traffic noise presented in Table 4-2, 28 of the study area roadway segments are shown to experience *potentially significant* off-site traffic noise level increases due to the proposed Project under Existing with Project conditions.

Section 7.4 describes the off-site traffic noise mitigation measures considered in this analysis. All other roadway segments would not experience noise level increases under Existing with Project conditions that would exceed the established thresholds of significance.

7.3 FUTURE BUILD-OUT 2040 WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

Table 7-3 presents the Future Build-Out 2040 without Project conditions CNEL noise levels. The Future Build-Out 2040 without Project exterior noise levels are expected to range from 66.0 to 74.7 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-4 shows the Future Build-Out 2040 with Project conditions will range from 67.0 to 75.6 dBA CNEL. Table 7-6 shows that the Project off-site traffic noise level increases will range from 0.0 to 5.5 dBA CNEL. Based on the significance criteria for off-site traffic noise presented in Table 4-2, 24 of the study area roadway segments are shown to experience *potentially significant* off-site traffic noise level increases due to the proposed Project under Future Build-Out (2040) with Project conditions.

TABLE 7-5: EXISTING WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]			Incremental Noise Level Increase Threshold[3]	
				No Project	With Project	Project Addition	Limit	Exceeded?
1	Waterman Avenue	Baseline Street to 5th Street	Sensitive	69.5	69.5	0.0	1.0	No
2	Waterman Avenue	5th Street to 3rd Street	Non-Sensitive	71.4	71.6	0.2	1.0	No
3	Tippecanoe Avenue	Baseline Street to 6th Street	Sensitive	68.3	68.7	0.4	1.0	No
4	Tippecanoe Avenue	6th Street to 3rd Street	Sensitive	69.0	70.3	1.3	1.0	Yes
5	Tippecanoe Avenue	3rd Street to Mill Street	Sensitive	72.8	74.1	1.3	1.0	Yes
6	Tippecanoe Avenue	Mill Street to Orange Show Road /San Bernardino Avenue	Sensitive	71.8	72.9	1.1	1.0	Yes
7	Tippecanoe Avenue	Orange Show Road/ San Bernardino Avenue to Harriman Place / I-10 WB Ramps	Sensitive	72.4	73.8	1.4	1.0	Yes
8	Del Rosa Drive	SR-210 EB Ramps to Highland Avenue	Sensitive	70.4	70.8	0.4	1.0	No
9	Del Rosa Drive	Highland Avenue to Pacific Street	Sensitive	69.0	69.6	0.6	1.0	No
10	Del Rosa Drive	Pacific Street to Baseline Street	Sensitive	67.5	68.3	0.8	1.0	No
11	Del Rosa Drive	Baseline Street to 9th Street	Sensitive	66.6	68.8	2.2	1.0	Yes
12	Del Rosa Drive	9th Street to 6th Street	Sensitive	66.6	68.8	2.2	1.0	Yes
13	Del Rosa Drive	6th Street to 3rd Street	Sensitive	66.4	67.3	0.9	1.0	No
14	Sterling Avenue	Base Line to 9th Street	Sensitive	66.6	67.6	1.0	1.0	Yes
15	Sterling Avenue	9th Street to 6th Street	Sensitive	65.6	66.4	0.8	1.0	No
16	Sterling Avenue	6th Street to 3rd Street	Sensitive	63.8	66.9	3.1	2.0	Yes
17	Victoria Avenue	Highland Avenue to Pacific Street	Sensitive	67.1	68.5	1.4	1.0	Yes
18	Victoria Avenue	Pacific Street to Base Line	Sensitive	67.8	69.1	1.3	1.0	Yes
19	Victoria Avenue	Base Line to 9th Street	Sensitive	68.0	69.6	1.6	1.0	Yes
20	Victoria Avenue	9th Street to 6th Street	Sensitive	66.7	68.8	2.1	1.0	Yes
21	Victoria Avenue	6th Street to 3rd Street	Sensitive	66.7	67.2	0.5	1.0	No

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]			Incremental Noise Level Increase Threshold[3]	
				No Project	With Project	Project Addition	Limit	Exceeded?
22	6th Street	Tippecanoe Avenue to Del Rosa Drive	Sensitive	63.9	65.3	1.4	2.0	No
23	6th Street	Del Rosa Drive to Sterling Avenue	Sensitive	65.5	67.6	2.1	1.0	Yes
24	6th Street	Sterling Avenue to Victoria Avenue	Sensitive	64.3	68.8	4.5	2.0	Yes
25	6th Street	Victoria Avenue to Central Avenue	Sensitive	64.9	69.2	4.3	2.0	Yes
26	5th Street	I-215 NB Ramps to E Street	Sensitive	71.5	73.0	1.5	1.0	Yes
27	5th Street	E Street to Waterman Avenue	Sensitive	69.7	71.7	2.0	1.0	Yes
28	5th Street	Waterman Avenue to Tippecanoe Avenue	Sensitive	68.8	72.7	3.9	1.0	Yes
29	5th Street	Tippecanoe Avenue to Del Rosa Drive	Sensitive	68.6	73.0	4.4	1.0	Yes
30	5th Street	Del Rosa Drive to Sterling Avenue	Sensitive	64.1	70.8	6.7	2.0	Yes
31	5th Street	Sterling Avenue to Victoria Avenue	Sensitive	65.1	73.3	8.2	1.0	Yes
32	5th Street	Victoria Avenue to Central Avenue	Sensitive	66.6	71.7	5.1	1.0	Yes
33	5th Street	Central Avenue to Palm Avenue	Sensitive	66.6	72.1	5.5	1.0	Yes
34	5th Street	Palm Avenue to SR-210 EB Ramps	Non-Sensitive	70.8	73.8	3.0	1.0	Yes
35	3rd Street	Waterman Avenue to Tippecanoe Avenue	Sensitive	66.8	67.3	0.5	1.0	No
36	3rd Street	Tippecanoe Avenue to Del Rosa Drive	Sensitive	68.6	71.0	2.4	1.0	Yes
37	3rd Street	Del Rosa Drive to Sterling Avenue	Sensitive	69.2	71.2	2.0	1.0	Yes
38	3rd Street	Sterling Avenue to Victoria Avenue	Sensitive	67.9	69.6	1.7	1.0	Yes
39	3rd Street	Victoria Avenue to Palm Avenue	Sensitive	66.9	69.0	2.1	1.0	Yes

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the receiving land use.
[3] Does the Project create an incremental noise level increase exceeding the significance criteria (Table 4-2)?

TABLE 7-6: FUTURE BUILD-OUT 2040 WITH PROJECT TRAFFIC NOISE INCREASES

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]			Incremental Noise Level Increase Threshold[3]	
				No Project	With Project	Project Addition	Limit	Exceeded?
1	Waterman Avenue	Baseline Street to 5th Street	Sensitive	70.0	70.0	0.0	1.0	No
2	Waterman Avenue	5th Street to 3rd Street	Non-Sensitive	72.0	72.1	0.1	1.0	No
3	Tippecanoe Avenue	Baseline Street to 6th Street	Sensitive	70.3	70.6	0.3	1.0	No
4	Tippecanoe Avenue	6th Street to 3rd Street	Sensitive	69.6	70.8	1.2	1.0	Yes
5	Tippecanoe Avenue	3rd Street to Mill Street	Sensitive	74.7	75.6	0.9	1.0	No
6	Tippecanoe Avenue	Mill Street to Orange Show Road /San Bernardino Avenue	Sensitive	73.4	74.2	0.8	1.0	No
7	Tippecanoe Avenue	Orange Show Road/ San Bernardino Avenue to Harriman Place / I-10 WB Ramps	Sensitive	73.0	74.2	1.2	1.0	Yes
8	Del Rosa Drive	SR-210 EB Ramps to Highland Avenue	Sensitive	70.8	71.2	0.4	1.0	No
9	Del Rosa Drive	Highland Avenue to Pacific Street	Sensitive	69.5	70.0	0.5	1.0	No
10	Del Rosa Drive	Pacific Street to Baseline Street	Sensitive	68.5	69.1	0.6	1.0	No
11	Del Rosa Drive	Baseline Street to 9th Street	Sensitive	67.5	69.3	1.8	1.0	Yes
12	Del Rosa Drive	9th Street to 6th Street	Sensitive	67.5	69.4	1.9	1.0	Yes
13	Del Rosa Drive	6th Street to 3rd Street	Sensitive	67.7	68.3	0.6	1.0	No
14	Sterling Avenue	Base Line to 9th Street	Sensitive	66.7	67.6	0.9	1.0	No
15	Sterling Avenue	9th Street to 6th Street	Sensitive	67.0	67.6	0.6	1.0	No
16	Sterling Avenue	6th Street to 3rd Street	Sensitive	66.0	68.2	2.2	1.0	Yes
17	Victoria Avenue	Highland Avenue to Pacific Street	Sensitive	70.4	71.1	0.7	1.0	No
18	Victoria Avenue	Pacific Street to Base Line	Sensitive	68.7	69.8	1.1	1.0	Yes
19	Victoria Avenue	Base Line to 9th Street	Sensitive	68.6	70.1	1.5	1.0	Yes
20	Victoria Avenue	9th Street to 6th Street	Sensitive	67.6	69.4	1.8	1.0	Yes
21	Victoria Avenue	6th Street to 3rd Street	Sensitive	68.4	68.8	0.4	1.0	No
22	6th Street	Tippecanoe Avenue to Del Rosa Drive	Sensitive	66.1	67.0	0.9	1.0	No

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]			Incremental Noise Level Increase Threshold[3]	
				No Project	With Project	Project Addition	Limit	Exceeded?
23	6th Street	Del Rosa Drive to Sterling Avenue	Sensitive	67.5	69.0	1.5	1.0	Yes
24	6th Street	Sterling Avenue to Victoria Avenue	Sensitive	68.0	70.5	2.5	1.0	Yes
25	6th Street	Victoria Avenue to Central Avenue	Sensitive	66.5	69.8	3.3	1.0	Yes
26	5th Street	I-215 NB Ramps to E Street	Sensitive	72.4	73.6	1.2	1.0	Yes
27	5th Street	E Street to Waterman Avenue	Sensitive	70.2	72.1	1.9	1.0	Yes
28	5th Street	Waterman Avenue to Tippecanoe Avenue	Sensitive	70.6	73.5	2.9	1.0	Yes
29	5th Street	Tippecanoe Avenue to Del Rosa Drive	Sensitive	70.8	73.9	3.1	1.0	Yes
30	5th Street	Del Rosa Drive to Sterling Avenue	Sensitive	66.9	71.6	4.7	1.0	Yes
31	5th Street	Sterling Avenue to Victoria Avenue	Sensitive	68.5	74.0	5.5	1.0	Yes
32	5th Street	Victoria Avenue to Central Avenue	Sensitive	67.4	72.0	4.6	1.0	Yes
33	5th Street	Central Avenue to Palm Avenue	Sensitive	67.4	72.3	4.9	1.0	Yes
34	5th Street	Palm Avenue to SR-210 EB Ramps	Non-Sensitive	71.9	74.4	2.5	1.0	Yes
35	3rd Street	Waterman Avenue to Tippecanoe Avenue	Sensitive	68.0	68.3	0.3	1.0	No
36	3rd Street	Tippecanoe Avenue to Del Rosa Drive	Sensitive	69.6	71.6	2.0	1.0	Yes
37	3rd Street	Del Rosa Drive to Sterling Avenue	Sensitive	72.0	73.2	1.2	1.0	Yes
38	3rd Street	Sterling Avenue to Victoria Avenue	Sensitive	69.9	71.0	1.1	1.0	Yes
39	3rd Street	Victoria Avenue to Palm Avenue	Sensitive	69.3	70.6	1.3	1.0	Yes

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the receiving land use.
[3] Does the Project create an incremental noise level increase exceeding the significance criteria (Table 4-2)?

7.4 OFF-SITE TRAFFIC NOISE MITIGATION

To reduce the *potentially significant* Project traffic noise level increases on the 28 study area roadway segments for Existing plus Project, and on the 24 study area roadway segments for Future Build-Out with Project conditions, potential noise mitigation measures are identified in this analysis. Potential mitigation measures discussed below include rubberized asphalt hot mix pavement and off-site noise barriers for the existing residential land uses adjacent to impacted roadway segments.

7.4.1 RUBBERIZED ASPHALT

Due to the potential noise attenuation benefits, rubberized asphalt is considered as a mitigation measure for the off-site Project-related traffic noise level increases. To reduce traffic noise levels at the noise source, Caltrans research has shown that rubberized asphalt can provide noise attenuation of approximately 4 dBA for automobile traffic noise levels. (21) Changing the pavement type of a roadway has been shown to reduce the amount of tire/pavement noise produced at the source under both near-term and long-term 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. (2) According to research conducted by Caltrans (21) and the Canadian Ministry of Transportation and Highways (22) a 4 dBA reduction in tire/pavement noise is attainable using rubberized asphalt under typical operating conditions.

The effectiveness of reducing traffic noise levels is higher on roadways with low percentages of heavy trucks, since the heavy truck engine and exhaust noise is not affected by rubberized alternative pavement due to the truck engine and exhaust stack height above the pavement itself. (21) Per Caltrans guidance a truck stack height is modeled using a height of 11.5 feet above the road. (4) (23) With the primary off-site traffic noise source consisting of heavy trucks with a stack height of 11.5 feet off the ground, the tire/pavement noise reduction benefits associated rubberized asphalt will be primarily limited to autos.

While the off-site Project-related traffic noise level increases would theoretically be reduced with the 4 dBA reduction provided by rubberized asphalt, the reduction would not provide reliable benefits for the noise levels generated by heavy truck traffic. This is, as previously stated, due to the noise source height difference between automobiles and trucks. While rubberized asphalt will provide some noise reduction, this noise study recognizes that this is only effective for tire-on-pavement noise at higher speeds and would not reduce truck-related off-site traffic noise levels associated with truck engine and exhaust stacks to less than significant levels. Since the use of rubberized asphalt would not lower the off-site traffic noise levels below a level of significance, rubberized asphalt is not proposed as mitigation for the Project and the off-site Project-related traffic noise level increases at adjacent land uses would remain *significant.*

7.4.2 OFF-SITE NOISE BARRIERS

Since existing and future noise-sensitive receiving land uses are located adjacent to the impacted roadway segments in the Project study area, off-site noise barriers were considered in this analysis as a potential traffic noise mitigation measure to reduce the impacts. 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. (4) As previously discussed, Caltrans guidance in the Highway Design Manual, Section 1102.3(3), indicates that for design purposes, *the noise barrier should intercept the line of sight from the exhaust stack of a truck to the receptor*, and an 11.5-foot-high truck stack height is assumed to represent the truck engine and exhaust noise source. (23) Therefore, any exterior noise barriers at receiving noise sensitive land uses 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) in order to provide a 5 dBA reduction per FHWA guidance. (23)

In addition, according to FHWA guidance, outdoor living areas are generally limited to outdoor living areas of frequent human use (e.g., backyards of single-family homes). Therefore, front and side yards of residential homes adjacent to off-site roadway segments do not represent noise sensitive areas of frequent human use that require exterior noise mitigation. (4) Exterior noise mitigation in the form of noise barriers is not anticipated to provide the FHWA attainable reduction of 5 dBA required to reduce the off-site traffic noise level increases and would also require potential openings for driveway access to individual residential lots fronting the road. As such, off-site noise barriers would not be feasible and would not lower the off-site traffic noise levels below a level of significance, and therefore, noise barriers are not proposed as mitigation for the Project.

7.4.3 SIGNIFICANT OFF-SITE TRAFFIC NOISE IMPACTS

Both rubberized asphalt and off-site noise barriers are considered as potential noise mitigation measures to reduce the *potentially significant* off-site traffic noise level increases shown on Tables 7-5 and 7-6. However, neither form of mitigation would eliminate the off-site traffic noise level increases at the adjacent land uses to the impacted roadway segments. Therefore, the Project-related off-site traffic noise level increases at adjacent noise-sensitive land are considered a *significant and unavoidable* impact.

8 SENSITIVE RECEIVER LOCATIONS

To assess the potential for long-term operational and short-term construction noise impacts, the following sensitive 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, out-patient 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, undeveloped land, parking lots, warehousing, liquid and solid waste facilities, salvage yards, and transit terminals.

To describe the potential off-site Project noise levels, eight receiver locations in the vicinity of the Project site were identified. All distances are measured from the Project site boundary to the outdoor living areas (e.g., private backyards) or at the building façade, whichever is closer to the Project site. The selection of receiver locations is based on FHWA guidelines and is consistent with additional guidance provided by Caltrans and the FTA, as previously described in Section 5.2. 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. Distance is measured in a straight line from the project boundary to each receiver location.

R1: Location R1 represents the existing noise sensitive residence at 7886 Fairfax Lane, approximately 74 feet north of the Project site. Since there are no private outdoor living areas (backyards) facing the Project site, receiver R1 is placed at the residential building façade. A 24-hour noise measurement was taken near this location, L1, to describe the existing ambient noise environment.

R2: Location R2 represents the existing noise sensitive residence at 25498 6th Street, approximately 84 feet north of the Project site. Since there are no private outdoor living areas (backyards) facing the Project site, receiver R2 is placed at the residential building façade. A 24-hour noise measurement was taken near this location, L2, to describe the existing ambient noise environment.

R3: Location R3 represents the existing noise sensitive residence at 26188 6th Street, approximately 98 feet north of the Project site. Since there are no private outdoor living areas (backyards) facing the Project site, receiver R3 is placed at the residential building façade. A 24-hour noise measurement near this location, L3, is used to describe the existing ambient noise environment.

R4: Location R4 represents the existing noise sensitive residence at 26740 6th Street, approximately 31 feet south of the Project site. Since there are no private outdoor living areas (backyards) facing the Project site, receiver R4 is placed at the residential building

façade. A 24-hour noise measurement near this location, L3, is used to describe the existing ambient noise environment.

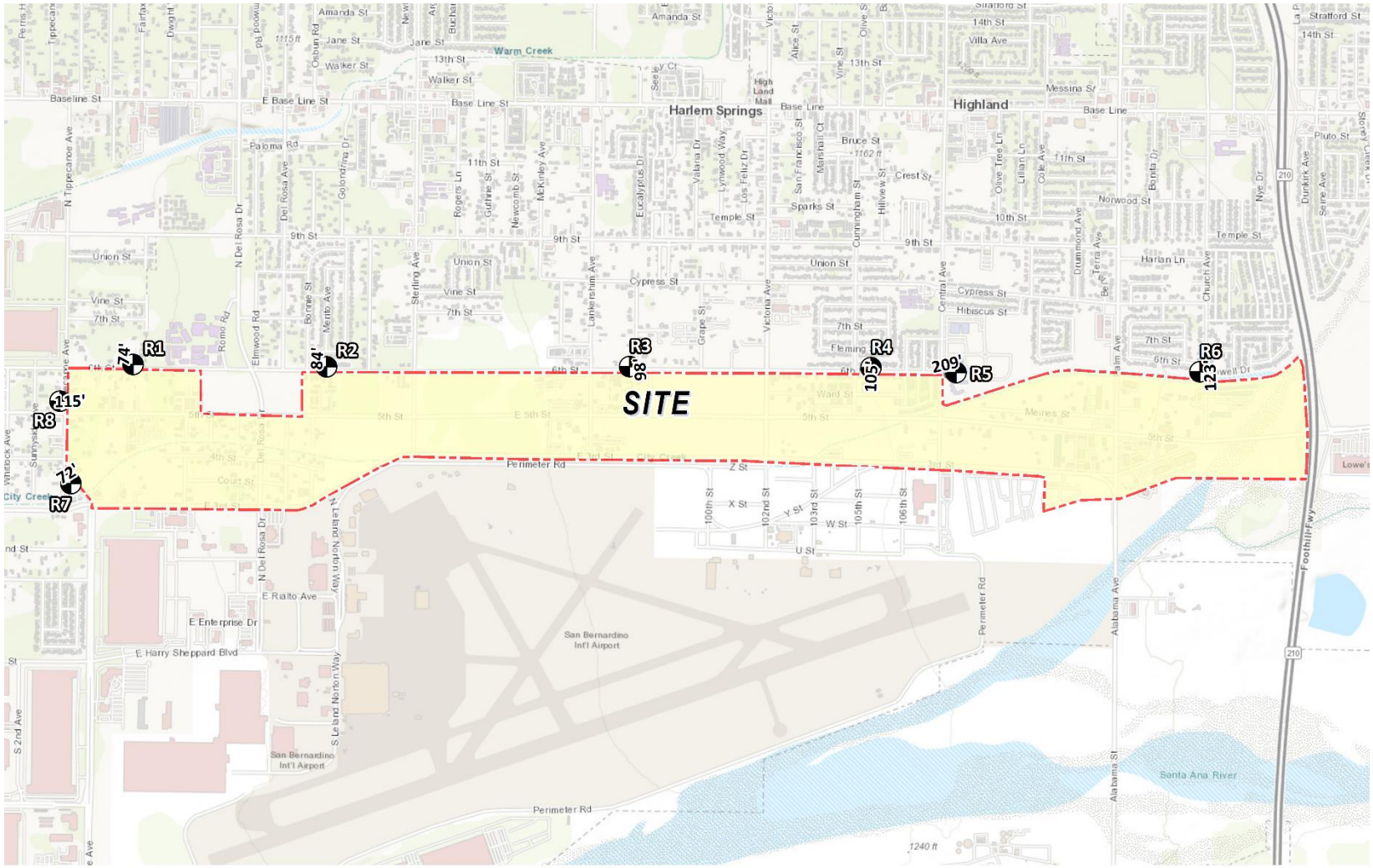
R5: Location R5 represents the Highland Branch Library at 7863 Central Avenue, approximately 209 feet northeast of the Project site. Receiver R5 is placed at the building façade. A 24-hour noise measurement near this location, L5, is used to describe the existing ambient noise environment.

R6: Location R6 represents the existing noise sensitive residence at 27487 E 6th Street, approximately 123 feet north of the Project site. R6 is placed at the private outdoor living area (backyard) facing the Project site. A 24-hour noise measurement near this location, L6, is used to describe the existing ambient noise environment.

R7: Location R6 represents the Trinity Christian Fellowship Church at 8174 Tippecanoe Avenue, approximately 72 feet southwest of the Project site. R7 is placed at the building façade. A 24-hour noise measurement near this location, L7 is used to describe the existing ambient noise environment.

R8: Location R8 represents the existing noise sensitive residence at 7976 Tippecanoe Avenue, approximately 115 feet west of the Project site. Since there are no private outdoor living areas (backyards) facing the Project site, receiver R8 is placed at the residential building façade. A 24-hour noise measurement near this location, L8, is used to describe the existing ambient noise environment.

EXHIBIT 8-A: SENSITIVE RECEIVER LOCATIONS



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9 OPERATIONAL NOISE IMPACTS

This section analyzes the potential stationary-source operational noise impacts at the nearest receiver locations, identified in Section 8, resulting from the operation of the AGSP.

9.1 OPERATIONAL NOISE SOURCES

This operational noise analysis is intended to describe noise level impacts associated with the typical daytime and nighttime activities at the Project site. 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 on-site Project-related noise sources are expected to include loading dock activity, delivery van activity, roof-top air conditioning units, parking lot vehicle activity, and trash enclosure activity.

9.2 REFERENCE NOISE LEVELS

To estimate the Project operational noise impacts, reference noise level measurements were collected from similar types of activities to represent the noise levels expected with the development of the proposed Project. This section provides a detailed description of the reference noise level measurements shown on Table 9-1 used to estimate the Project operational noise impacts. It is important to note that the following projected noise levels assume the worst-case noise environment with the loading dock activity, delivery van activity, roof-top air conditioning units, parking lot vehicle activity, and trash enclosure activity all operating continuously. These sources of noise activity will likely vary throughout the day.

9.2.1 MEASUREMENT PROCEDURES

The reference noise level measurements presented in this section were collected using a Larson Davis LxT Type 1 precisions sound level meter (serial number 01146). The LxT sound level meter was calibrated using a Larson-Davis calibrator, Model CAL 200, was programmed in "slow" mode to record noise levels in "A" weighted form and was located at approximately five feet above the ground elevation for each measurement. 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. (16)

TABLE 9-1: REFERENCE NOISE LEVEL MEASUREMENTS

Noise Source[1]	Noise Source Height (Feet)	Min./Hour[2]		Reference Noise Level @50 feet (dBA L_{eq})	Sound Power Level (dBA)[3]
		Day	Night		
Loading Dock Activity	8'	60	60	65.7	111.5
Delivery Van Activity	5'	60	60	61.4	101.2
Roof-Top Air Conditioning Units	5'	39	28	57.2	88.9
Trash Enclosure Activity	5'	20	20	56.8	89.0
Parking Lot Activity	5'	60	60	55.5	79.9

[1] As measured by Urban Crossroads, Inc.
[2] Anticipated duration (minutes within the hour) of noise activity during typical hourly conditions expected at the Project site. "Daytime" = 7:00 a.m. - 10:00 p.m.; "Nighttime" = 10:00 p.m. - 7:00 a.m.
[3] Sound power level represents the total amount of acoustical energy (noise level) produced by a sound source independent of distance or surroundings. Sound power levels calculated using the CadnaA noise model at the reference distance to the noise source. Numbers may vary due to size differences between point and area noise sources.

9.2.2 LOADING DOCK ACTIVITY

The reference loading dock activities are intended to describe the typical operational noise activities associated with the Project. This includes truck idling, reefer activity (refrigerator truck/cold storage), deliveries, backup alarms, unloading/loading, docking including a combination of tractor trailer semi-trucks, two-axle delivery trucks, and background forklift operations. To describe the loading dock activities for cold storage, a reference noise level measurement was taken in the center of the loading dock activity area and represents multiple concurrent noise sources resulting in a combined noise level of 65.7 dBA L_{eq} at a uniform distance of 50 feet. Specifically, the reference noise level measurement represents one truck located approximately 30 feet from the noise level meter with another truck passing by to park roughly 20 feet away, both with their engines idling. Throughout the reference noise level measurement, a separate docked and running reefer truck was located approximately 50 feet east of the measurement location. Additional background noise sources included truck pass-by noise, truck drivers talking to each other next to docked trucks, and air brake release noise when trucks parked. Noise associated with parking lot vehicle movements is expected 24 hours per day.

9.2.3 DELIVERY VAN ACTIVITY

To describe the delivery van activity, Urban Crossroads, collected reference noise level measurements from a delivery service partner. The delivery service partner maintains over 50 delivery vans and supporting operations. The reference noise level measurements suggest that at the center of activity the delivery vans generate a noise level of 61.4 dBA L_{eq} at a reference distance of 50 feet. The delivery van activities are limited to the daytime hours with no deliveries during the noise sensitive nighttime hours.

9.2.4 ROOF-TOP AIR CONDITIONING UNITS

To assess the noise levels created by the roof-top air conditioning units, reference noise level measurements were collected from a Lennox SCA120 series 10-ton model packaged air conditioning unit. At the uniform reference distance of 50 feet, the reference noise levels are 57.2 dBA L_{eq}. Based on the typical operating conditions observed over a four-day measurement period, the roof-top air conditioning units are estimated to operate for an average of 39 minutes per hour during the daytime hours, and 28 minutes per hour during the nighttime hours. For this noise analysis, the air conditioning units are expected to be located on the roof of the proposed building. This reference noise level describes the expected roof-top air conditioning units located 5 feet above the roof for the planned air conditioning units at the Development Site.

9.2.5 TRASH ENCLOSURE ACTIVITY

To describe the noise levels associated with a trash enclosure activity, Urban Crossroads collected a reference noise level measurement at an existing trash enclosure containing two dumpster bins. The trash enclosure noise levels describe metal gates opening and closing, metal scraping against concrete floor sounds, dumpster movement on metal wheels, and trash dropping into the metal dumpster. The reference noise levels describe trash enclosure noise activities when trash is dropped into an empty metal dumpster, as would occur at the Project Site. The measured reference noise level at the uniform 50-foot reference distance is 56.8 dBA L_{eq} for the trash enclosure activity. The reference noise level describes the expected noise source activities associated with the trash enclosures for the Project's proposed building. Typical trash enclosure activities are estimated to occur for 20 minutes per hour.

9.2.6 PARKING LOT ACTIVITY

To determine the noise levels associated with parking lot vehicle movements, Urban Crossroads collected reference noise level measurements at an existing warehouse parking lot. The reference noise level at 50 feet from parking lot vehicle movements was measured at 55.5 dBA L_{eq}. The parking lot noise levels are mainly due to employee shift changes with cars pulling in and out of spaces during peak lunch hour activity and employees talking. Noise associated with parking lot vehicle movements is expected 24 hours per day.

9.3 CADNAA NOISE PREDICTION MODEL

To fully describe the exterior operational noise levels from the Project, Urban Crossroads, Inc. developed a noise prediction model using the CadnaA (Computer Aided Noise Abatement) computer program. CadnaA can analyze multiple types of noise sources using the spatially accurate Project site plan, georeferenced Nearmap aerial imagery, topography, buildings, and barriers in its calculations to predict outdoor noise levels. Using the ISO 9613 protocol, CadnaA will calculate the distance from each noise source to the noise receiver locations, using the ground absorption, distance, and barrier/building attenuation inputs to provide a summary of noise level at each receiver and the partial noise level contributions by noise source. Consistent with the ISO 9613 protocol, the CadnaA noise prediction model relies on the reference sound power level (Lw) to describe individual noise sources. While sound pressure levels (e.g. L_{eq})

quantify in decibels the intensity of given sound sources at a reference distance, sound power levels (Lw) are connected to the sound source and are independent of distance. Sound pressure levels vary substantially with distance from the source and diminish from intervening obstacles and barriers, air absorption, wind, and other factors. Sound power is the acoustical energy emitted by the sound source and is an absolute value that is not affected by the environment.

The operational noise level calculations provided in this noise study 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. A default ground attenuation factor of 0.5 was used in the noise analysis to account for mixed ground representing a combination of hard and soft surfaces consistent with study area conditions. Appendix 9.1 includes the detailed noise model inputs.

9.4 PROJECT OPERATIONAL NOISE LEVELS

Using the reference noise levels to represent the proposed Project operations that include loading dock activity, delivery van activity, roof-top air conditioning units, parking lot vehicle activity, and trash enclosure activity, Urban Crossroads, Inc. calculated the unmitigated 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 hourly Project operational noise levels at the off-site receiver locations are expected to range from 60.9 to 62.9 dBA L_{eq}.

9.5 PROJECT OPERATIONAL NOISE LEVEL COMPLIANCE

To demonstrate compliance with local noise regulations, the Project-only operational noise levels are evaluated against exterior noise level thresholds based on the exterior noise level standards at nearest noise-sensitive receiver locations. Table 9-2 shows the operational noise levels associated with AGSP will satisfy the 65 dBA L_{eq} exterior noise level standards at the nearest receiver locations. Therefore, the operational noise impacts are considered *less than significant* at the nearest noise-sensitive receiver locations.

9.6 PROJECT OPERATIONAL NOISE LEVEL INCREASES

To describe the Project operational noise level increases, the Project operational noise levels are combined with the existing ambient noise levels measurements for the nearest 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. (2) Instead, they must be logarithmically added using the following base equation:

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

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.

TABLE 9-2: OPERATIONAL NOISE LEVEL COMPLIANCE

Receiver Location[1]	Project Noise Level (dBA Leq)[2]	Noise Level Standards (dBA Leq)[3]	Noise Level Standards Exceeded?[4]
R1	62.9	65	No
R2	62.7	65	No
R3	62.7	65	No
R4	62.5	65	No
R5	60.9	65	No
R6	62.2	65	No
R7	62.5	65	No
R8	61.5	65	No

[1] See Exhibit 8-A for the receiver locations.
[2] Project CadnaA operational noise level calculations are included in Appendix 9.1.
[3] Exterior noise level standards as shown on Table 4-1.
[4] Do the estimated Project operational noise source activities exceed the noise level standards?

The difference between the combined Project and ambient noise levels describe the Project noise level increases to the existing ambient noise environment. As indicated on Tables 9-3 and 9-4, the Project will generate daytime and nighttime operational noise level increases ranging from 0.9 to 12.7 dBA L_{eq} at the nearest receiver locations. Therefore, the unmitigated Project operational incremental noise level increase is considered *potentially significant*.

9.7 OPERATIONAL NOISE ABATEMENT MEASURES

To reduce potential operational noise levels increases at the nearby noise-sensitive receiver locations, the AGSP shall include the following operational noise mitigation measures:

- The AGSP shall be designed to minimize the potential noise exposure to nearby noise sensitive land uses including:
    - locating driveways and vehicle access points away from noise sensitive uses.
    - locating loading docks away from adjacent noise sensitive uses.
    - minimize the use of outside speakers and amplifiers.
    - incorporate walls landscaping and other noise buffers and barriers between uses, as appropriate.
- Sound barrier walls or earth berms of sufficient height and length shall be provided to reduce exterior noise levels to 65 CNEL or lower at nearby noise sensitive uses. Prior to the issuance of grading permits, an acoustical analysis report shall be prepared by a qualified acoustical consultant. The report shall specify the noise barriers' height, location, and types capable of achieving the desired mitigation affect.

- All on-site operating equipment that is used in outdoor areas (including but not limited to trucks, tractors, forklifts, and hostlers), shall be operated 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.

With the implementation of the recommended operational noise mitigation measures, the incremental noise level increase will be reduced to less than significant.

TABLE 9-3: DAYTIME PROJECT OPERATIONAL NOISE LEVEL INCREASES

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Noise Sensitive Land Use?	Increase Criteria[7]	Increase Criteria Exceeded?
R1	62.9	L1	57.7	64.0	6.3	Yes	3.0	Yes
R2	62.7	L2	64.2	66.5	2.3	Yes	3.0	No
R3	62.7	L3	60.5	64.7	4.2	Yes	3.0	Yes
R4	62.5	L4	61.4	65.0	3.6	Yes	3.0	Yes
R5	60.9	L5	51.9	61.4	9.5	Yes	5.0	Yes
R6	62.2	L6	58.5	63.7	5.2	Yes	5.0	Yes
R7	62.5	L7	70.6	71.2	0.6	Yes	1.5	No
R8	61.5	L8	64.4	66.2	1.8	Yes	3.0	No

[1] See Exhibit 8-A for the receiver locations.
[2] Total Project operational noise levels as shown on Table 9-2.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed daytime 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 increase criteria as shown on Table 4-2.

TABLE 9-4: NIGHTTIME OPERATIONAL NOISE LEVEL INCREASES

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Noise Sensitive Land Use?	Increase Criteria[7]	Increase Criteria Exceeded?
R1	62.9	L1	54.9	63.5	8.6	Yes	5.0	Yes
R2	62.7	L2	59.1	64.3	5.2	Yes	3.0	Yes
R3	62.7	L3	57.2	63.8	6.6	Yes	3.0	Yes
R4	62.5	L4	58.6	64.0	5.4	Yes	3.0	Yes
R5	60.9	L5	48.4	61.1	12.7	Yes	5.0	Yes
R6	62.2	L6	57.1	63.4	6.3	Yes	3.0	Yes
R7	62.5	L7	68.8	69.7	0.9	Yes	1.0	No
R8	61.5	L8	61.6	64.6	3.0	Yes	2.0	Yes

[1] See Exhibit 8-A for the receiver locations.
[2] Total Project operational noise levels as shown on Table 9-2.
[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 increase criteria as shown on Table 4-2.

10 CONSTRUCTION IMPACTS

This section analyzes potential impacts resulting from the short-term construction activities associated with the development of the Project. Exhibits 10-A and 10-B show the construction noise source locations in relation to the nearest sensitive receiver locations previously described in Section 8.

10.1 CONSTRUCTION NOISE LEVELS

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

- Demolition
- Site Preparation
- Grading
- Building Construction
- Paving/Landscaping
- 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 more than 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.

10.2 TYPICAL CONSTRUCTION REFERENCE NOISE LEVELS

To describe the Project typical construction noise levels, measurements were collected for similar activities at several construction sites. Table 10-1 provides a summary of the 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 uniform reference distance of 50 feet.

EXHIBIT 10-A: TYPICAL CONSTRUCTION NOISE SOURCE LOCATIONS

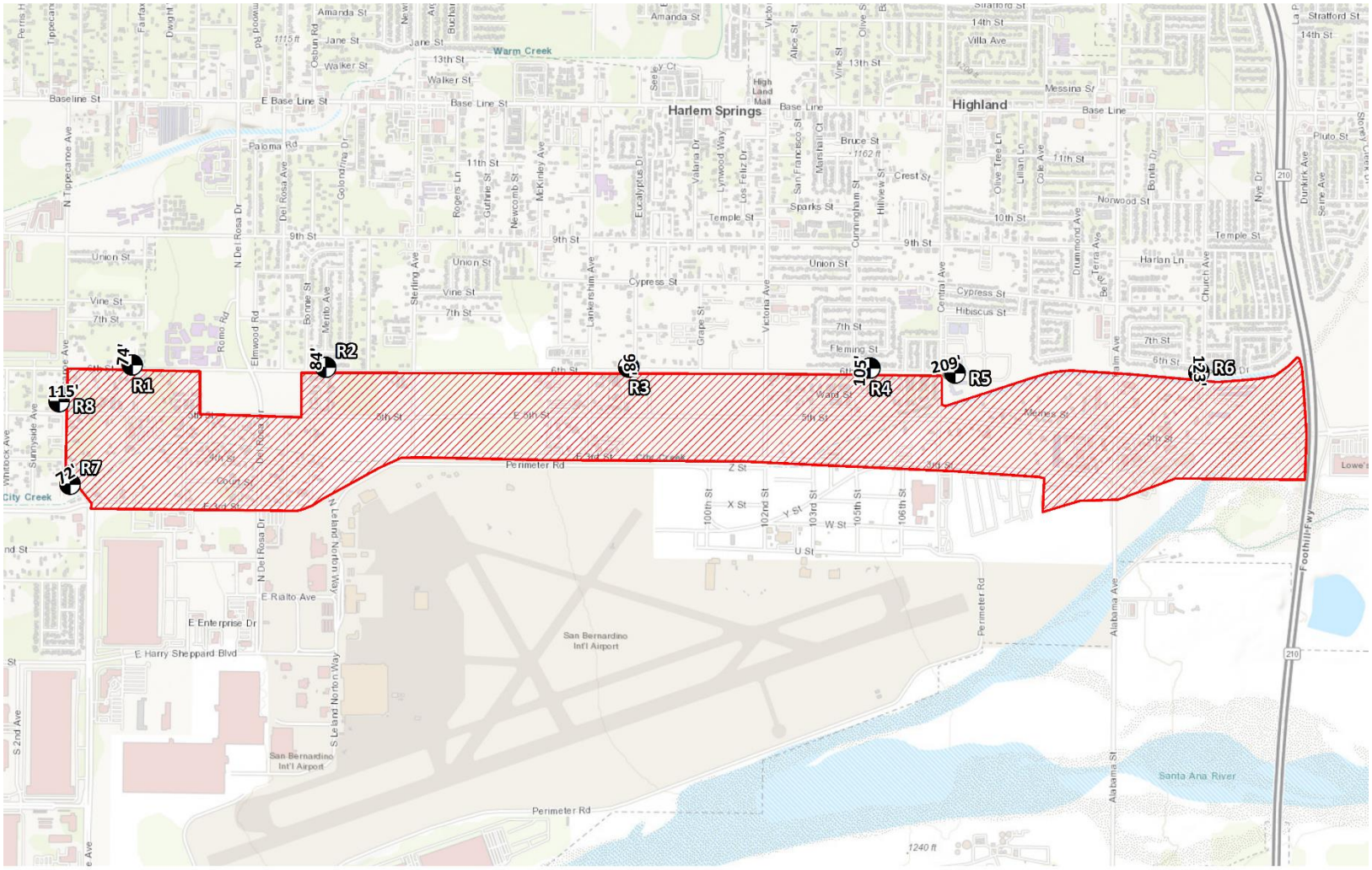

TABLE 10-1: TYPICAL CONSTRUCTION REFERENCE NOISE LEVELS

Construction Stage	Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})	Highest Reference Noise Level (dBA L_{eq})
Demolition	Demolition Activity	67.9	71.9
	Backhoe	64.2	
	Water Truck Pass-By & Backup Alarm	71.9	
Site Preparation	Scraper, Water Truck, & Dozer Activity	75.3	75.3
	Backhoe	64.2	
	Water Truck Pass-By & Backup Alarm	71.9	
Grading	Rough Grading Activities	73.5	73.5
	Water Truck Pass-By & Backup Alarm	71.9	
	Construction Vehicle Maintenance Activities	67.5	
Building Construction	Foundation Trenching	68.2	71.6
	Framing	62.3	
	Concrete Mixer Backup Alarms & Air Brakes	71.6	
Paving/ Landscaping	Concrete Mixer Truck Movements	71.2	71.2
	Concrete Paver Activities	65.6	
	Concrete Mixer Pour & Paving Activities	65.9	
Architectural Coating	Air Compressors	65.2	65.2
	Generator	64.9	
	Crane	62.3	

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

10.3 TYPICAL CONSTRUCTION NOISE ANALYSIS

Using the reference construction equipment noise levels and the CadnaA noise prediction model, calculations of the Project construction noise level impacts with multiple pieces of equipment operating simultaneously at the nearest sensitive receiver locations were completed. To assess the worst-case construction noise levels, the Project construction noise analysis relies on the highest noise level impacts when the equipment with the highest reference noise level is operating at the closest point from the edge of primary construction activity (Project Site boundary) to each receiver location. As shown on Table 10-2, the construction noise levels are expected to range from 60.4 to 72.5 dBA L_{eq}, and the highest construction levels are expected to range from 70.5 to 72.5 dBA L_{eq} at the nearest receiver locations. Appendix 10.1 includes the detailed CadnaA construction noise model inputs.

TABLE 10-2: TYPICAL CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})						
	Demolition	Site Preparation	Grading	Building Construction	Paving/ Landscaping	Architectural Coating	Highest Levels[2]
R1	69.1	72.5	70.7	68.8	68.4	62.4	72.5
R2	68.8	72.2	70.4	68.5	68.1	62.1	72.2
R3	68.8	72.2	70.4	68.5	68.1	62.1	72.2
R4	68.7	72.1	70.3	68.4	68.0	62.0	72.1
R5	67.1	70.5	68.7	66.8	66.4	60.4	70.5
R6	68.4	71.8	70.0	68.1	67.7	61.7	71.8
R7	68.7	72.1	70.3	68.4	68.0	62.0	72.1
R8	67.7	71.1	69.3	67.4	67.0	61.0	71.1

[1] Noise receiver locations are shown on Exhibit 10-A.
[2] Construction noise level calculations based on distance from the project site boundaries (construction activity area) to nearby receiver locations. CadnaA construction noise model inputs are included in Appendix 10.1.

10.4 TYPICAL CONSTRUCTION NOISE LEVEL COMPLIANCE

To evaluate whether the Project will generate potentially significant short-term noise levels at nearest receiver locations, a construction-related daytime noise level threshold of 80 dBA L_{eq} is used as a reasonable threshold to assess the daytime construction noise level impacts. The construction noise analysis shows that the nearest receiver locations will satisfy the reasonable daytime 80 dBA L_{eq} significance threshold during Project construction activities as shown on Table 10-3. Therefore, the noise impacts due to Project construction noise is considered *less than significant* at all nearest receiver locations.

TABLE 10-3: TYPICAL CONSTRUCTION NOISE LEVEL COMPLIANCE

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})		
	Highest Construction Noise Levels[2]	Threshold[3]	Threshold Exceeded?[4]
R1	72.5	80	No
R2	72.2	80	No
R3	72.2	80	No
R4	72.1	80	No
R5	70.5	80	No
R6	71.8	80	No
R7	72.1	80	No
R8	71.1	80	No

[1] Noise receiver locations are shown on Exhibit 10-A.
[2] Highest construction noise level calculations based on distance from the construction noise source activity to nearby receiver locations as shown on Table 10-2.
[3] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual.
[4] Do the estimated Project construction noise levels exceed the construction noise level threshold?

10.6 TYPICAL CONSTRUCTION VIBRATION ANALYSIS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods employed. Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Ground vibration levels associated with various types of construction equipment are summarized on Table 10-4. Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the potential for human response (annoyance) and building damage using the following vibration assessment methods defined by the FTA. To describe the vibration impacts the FTA provides the following equation: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$

TABLE 10-4: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

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

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual

Table 10-5 presents the expected Project related typical construction activity vibration levels at each of the receiver locations. At distances ranging from 72 to 209 feet from Project construction activity, the transient construction vibration velocity levels are estimated to range from 0.004 to 0.018 PPV in/sec, as shown on Table 10-5. Based on maximum acceptable transient vibration threshold of 1.0 PPV (in/sec) for new residential structures, the typical Project construction vibration levels will satisfy the building damage thresholds at all the nearest receiver locations.

In addition, the construction vibration analysis on Table 10-5 shows that the vibration levels will satisfy the *barely perceptible* maximum transient vibration human annoyance threshold of 0.04 PPV (in/sec) at all the nearest receiver locations. Therefore, the vibration impacts due to the typical Project construction activities are considered *less than significant*. In addition, the typical construction vibration levels at the nearest sensitive receiver locations are unlikely to be sustained during the entire construction period but will occur rather only during the times that heavy construction equipment is operating adjacent to the Project site boundaries.

TABLE 10-5: TYPICAL CONSTRUCTION EQUIPMENT VIBRATION LEVELS

Receiver[1]	Structure Type[2]	Distance to Const. Activity (Feet)[3]	Typical Construction Vibration Levels PPV (in/sec)[4]					Thresholds PPV (in/sec)[5]		Thresholds Exceeded?[6]	
			Small bulldozer	Jackhammer	Loaded Trucks	Large bulldozer	Highest Vibration Level	Building Damage	Human Annoyance	Building Damage	Human Annoyance
R1	Residential	74'	0.001	0.007	0.015	0.017	0.017	1.00	0.04	No	No
R2	Residential	84'	0.000	0.006	0.012	0.014	0.014	1.00	0.04	No	No
R3	Residential	98'	0.000	0.005	0.010	0.011	0.011	1.00	0.04	No	No
R4	Residential	105'	0.000	0.004	0.009	0.010	0.010	1.00	0.04	No	No
R5	Library	209'	0.000	0.001	0.003	0.004	0.004	1.00	0.04	No	No
R6	Residential	123'	0.000	0.003	0.007	0.008	0.008	1.00	0.04	No	No
R7	Church	72'	0.001	0.007	0.016	0.018	0.018	1.00	0.04	No	No
R8	Residential	115'	0.000	0.004	0.008	0.009	0.009	1.00	0.04	No	No

[1] Receiver locations are shown on Exhibit 8-A.
[2] Caltrans Transportation and Construction Vibration Guidance Manual, April 2020, Tables 19, p. 38.
[3] Distance from receiver location to Project construction boundary.
[4] Based on the Vibration Source Levels of Construction Equipment (Table 10-4).
[5] Thresholds for transient sources associated with typical construction activities, Caltrans Transportation and Construction Vibration Manual, April 2020 p.38. (see Tables 3-2 & 3-3).
[6] Does the peak vibration exceed the acceptable vibration thresholds?
"PPV" = Peak Particle Velocity

11 REFERENCES

1. **State of California.** *California Environmental Quality Act, Appendix G.* 2018.
2. **California Department of Transportation Environmental Program.** *Technical Noise Supplement - A Technical Supplement to the Traffic Noise Analysis Protocol.* Sacramento, CA : s.n., September 2013.
3. **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.* March 1974. EPA/ONAC 550/9/74-004.
4. **U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning, Noise and Air Quality Branch.** *Highway Traffic Noise Analysis and Abatement Policy and Guidance.* December 2011.
5. **U.S. Department of Transportation, Federal Highway Administration.** *Highway Traffic Noise in the United States, Problem and Response.* April 2000. p. 3.
6. **U.S. Environmental Protection Agency Office of Noise Abatement and Control.** *Noise Effects Handbook-A Desk Reference to Health and Welfare Effects of Noise.* October 1979 (revised July 1981). EPA 550/9/82/106.
7. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment Manual.* September 2018.
8. **Office of Planning and Research.** *State of California General Plan Guidelines.* October 2017.
9. **State of California.** *2016 California Green Building Standards Code.* August 2019 Supplement.
10. **City of San Bernardino.** *General Plan, Noise Element.* November 2005.
11. —. *Development Code, Title 19, Article III, Chapter 19.20 - Property Development Standards.*
12. —. *Municipal Code, Title 8, Section 8.54 - Noise Control.*
13. **California Department of Transportation.** *Transportation and Construction Vibration Guidance Manual.* April 2020.
14. **San Bernardino International Airport Authority.** *Final Environmental Assessment - Eastgate Air Cargo Facility.* December 2019.
15. **California Court of Appeal.** *King and Gardiner Farms, LLC v. County of Kern (2020) .* 45 Cal.App.5th 814, 893,
16. **American National Standards Institute (ANSI).** *Specification for Sound Level Meters ANSI S1.4-2014/IEC 61672-1:2013.*
17. **U.S. Department of Transportation, Federal Highway Administration.** *FHWA Highway Traffic Noise Prediction Model.* December 1978. FHWA-RD-77-108.
18. **California Department of Transportation Environmental Program, Office of Environmental Engineering.** *Use of California Vehicle Noise Reference Energy Mean Emission Levels (Calveno REMELs) in FHWA Highway Traffic Noise Prediction.* September 1995. TAN 95-03.
19. **California Department of Transportation.** *Traffic Noise Attenuation as a Function of Ground and Vegetation Final Report.* June 1995. FHWA/CA/TL-95/23.
20. **Kimley-Horn and Associates, Inc.** *Traffic Impact Study for the Airport Gateway Specific Plan Project .* November 2020.

21. **California Department of Transportation Environmental Program.** *I-80 Davis OGAC Pavement Noise Study.* September 2001.

22. **Canadian Ministry of Transportation and Highways, Highway Environment Branch.** *Open-Graded Asphalt 'Quiet Pavement' - Assessment of Traffic Noise Reduction Performance.* November 1995.

23. **California Department of Transportation.** *Highway Design Manual, Chapter 1100 Highway Traffic Noise Abatement.* November 2017.

12 CERTIFICATION

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed Airport Gateway Specific Plan 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) 584-3148.

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 MUNICIPAL CODE

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CHAPTER 19.20
PROPERTY DEVELOPMENT STANDARDS

Sections:

Tables:

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 Structural Setback Restirictions
3. Antennae, Satellite Dishes and Telecommunications Facilities
4. Design Considerations
5. Dust and Dirt
6. Environmental Resources/Constraints
7. Exterior Building/Structure Walls

14. LIGHTING

Exterior lighting shall be energy-efficient and shielded or recessed so that direct glare and reflections are contained within the boundaries of the parcel, and shall be directed downward and away from adjoining properties and public rights-of-way. No lighting shall blink, flash, or be of unusually high intensity or brightness. All lighting fixtures shall be appropriate in scale, intensity, and height to the use it is serving. Security lighting shall be provided at all entrances/exits.

15. NOISE

No loudspeaker, bells, gongs, buzzers, mechanical equipment or other sounds, attention-attracting, 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 ¾-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. ODOR

No use shall emit any obnoxious odor or fumes.

17. PROJECTIONS/CONSTRUCTION AND EQUIPMENT PERMITTED INTO SETBACKS

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

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

B. Rear Setback: Roof overhangs, pools, patio covers, tennis courts, gazebos, and awnings & canopies, provided there is no projection within 10 feet of the property line. Accessory structures may be built to the interior side or rear property lines provided that such structures are not closer than 10 feet to any other structures.

(Ord. MC-876, 6-09-93)

C. Side Setback: Roof overhangs, fireplace chimney, awnings & canopies

Building Code requirements may further restrict the distance required to be maintained from the property lines and other structures.

28. VIBRATION

No vibration associated with any use shall be permitted which is discernible beyond the boundary line of the property.

Chapter 8.54
NOISE CONTROL

Sections:

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, 5-23-07; Ord. 1925, 11-06-51)

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.

H. 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.

I. 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.

L. The operation or use between the hours of 10:00 p.m. and 8:00 a.m. of any 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.

M. 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, 5-23-07; Ord. 2102, 4-03-56; Ord. 1925, 11-06-51)

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, 5-23-07; Ord. MC-649, 1-04-89; Ord. 1925, 11-06-51)

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, 5-23-07; Ord. MC-460, 5-15-85; Ord. 1925, 11-06-51)

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, 5-23-07)

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, 5-23-07)

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, 5-23-07)

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, 5-23-07)

8.54.090 Severability

The provisions of this Chapter are severable, and, if any sentence, section or other part of this Chapter should be found to be invalid, such invalidity shall not affect the remaining provisions, and the remaining provisions shall continue in full force and effect.

(Ord. MC-1246, 5-23-07)

[Return to Municipal Code Contents]

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APPENDIX 3.2:

CITY OF HIGHLAND MUNICIPAL CODE

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Chapter 8.50

NOISE CONTROL

Sections:

8.50.010 Findings and purpose.

A. It is the purpose of these regulations to implement the goals and objectives of the noise element of the city's general plan, to establish community-wide noise standards and to serve as a reference for locating other city regulations relating to noise in the community. 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 which should be regulated in the public interest.

B. In furtherance of the foregoing purpose, the city council finds and declares as follows:

1. The making, creation or maintenance of such loud, unnecessary, unnatural or unusual noises or vibrations that are prolonged, unusual, annoying, disturbing and unnatural in their time, place and use are a detriment to the public health, comfort, convenience, safety, general welfare and the peace and quiet of the city and its inhabitants; and

2. The public interest necessity for 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 pursuit 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. 324 § 2, 2008)

8.50.020 Definitions.

For the purposes of this chapter, the following terms shall have the meanings given:

"Construction equipment" means tools, machinery or equipment used in connection with construction operations, including all types of "special construction" equipment as defined in the pertinent sections of the California Vehicle Code when used in the construction process on any construction site, home improvement site or property maintenance site, regardless of whether such site be located on highway or off highway.

"Enforcement officer" means a city code enforcement officer or peace officer authorized to enforce the provisions and prohibitions of this chapter pursuant to HMC 8.50.070.

"Plainly audible" means any sound that can be detected by a person using his or her unaided hearing faculties. As an example, if the sound source under investigation is a portable or personal vehicular sound amplification or reproduction device, the investigating enforcement officer need not determine the title of any music, specific words, or the artist performing the music. The detection of the vibration from the rhythmic bass component of the music is sufficient to constitute a plainly audible sound.

"Public right-of-way" means any street, avenue, boulevard, highway, sidewalk, alley or similar place, owned or controlled by a government entity.

"Public space" means any real property or structure(s) on real property, owned by a government entity and normally accessible to the public, including but not limited to parks and other recreation areas.

"Responsible person" means (1) any person who owns, leases or is lawfully in charge of the property or motor vehicle where the noise violation takes place or (2) 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. (Ord. 324 § 2, 2008)

8.50.030 Prohibited acts.

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

1. Sounding any horn or signal device on any automobile, motorcycle, bus or other motor vehicle in any other manner or circumstance(s) or for any other purpose than required or permitted by the Vehicle Code or other state laws.

2. 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.

3. 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.

4. Operating or permitting the use or operation of personal or commercial music or sound amplification or production equipment that is:

a. Plainly audible across property boundaries;

b. Plainly audible through partitions common to two residences within a building;

c. Plainly audible at a distance of 50 feet in any direction from the source of music or sound, between the hours of 7:00 a.m. and 10:00 p.m.; or

d. Plainly audible at a distance of 25 feet in any direction from the source of music or sound, between the hours of 10:00 p.m. and 7:00 a.m.

5. 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 15 minutes of activation.

6. 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, clearly visible to the motoring public, indicating the presence of a school, institution of learning, church, court or hospital.

7. 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:

a. The level of noise;

b. Whether the nature of the noise is usual or unusual;

c. Whether the origin of the noise is natural or unnatural;

d. The level of the background noise;

e. The proximity of the noise to sleeping facilities;

f. The nature and zoning of the area(s) within which the noise emanates;

g. The density of the inhabitation of the area within which the noise emanates;

h. The time of day or night the noise occurs;

i. The duration of the noise; and

j. Whether the noise is produced by a commercial or noncommercial activity.

B. A violation of this section is a public nuisance.

C. A violation of this section may result in the following:

1. Issuance of an administrative citation, where the fines and penalties shall be assessed as infractions in accordance with HMC 2.56.110;

2. Issuance of a notice of public nuisance and abatement pursuant to Chapter 8.28 HMC;

3. Imposition of criminal and civil penalties, including those in Chapter 1.24 HMC; and

4. Confiscation and impoundment as evidence of the components that are amplifying or transmitting the prohibited noise.

D. An enforcement officer who encounters a violation of this section may issue a written notice to the responsible person demanding immediate abatement of the violation (written notice). The written notice shall inform the recipient that a second violation of the same provision within a 72-hour period may result in the issuance of a criminal citation and/or notice of public nuisance, the imposition of criminal and civil penalties, and confiscation and impoundment as evidence of the components that are amplifying or transmitting the prohibited noise.

E. Any peace officer who encounters a second violation of this section within a 72-hour period following issuance of a written notice is empowered to confiscate and impound as evidence any or all of the components amplifying or transmitting the sound.

F. Any person claiming legal ownership of the items confiscated and impounded under this section may request the return of the item by filing a written request with the police department within seven calendar days of the confiscation. Such requests shall be processed in accordance with the procedures adopted by the police department. (Ord. 370 § 27, 2012; Ord. 324 § 2, 2008)

8.50.040 Excessive noise and vibration emanating from a motor vehicle.

A. No person shall operate or occupy a motor vehicle on any public right-of-way, public place or private property, while operating or permitting the use or operation of any radio, stereo receiver, musical instrument, television, computer, compact disc player, tape recorder, cassette player or any other device for the production or reproduction of sound from within the motor vehicle, so that the sound is plainly audible at a distance of 50 feet from such vehicle, or in the case of a motor vehicle on private property, beyond the property line.

B. A violation of this section is a public nuisance.

C. A violation of this section may result in the following:

1. Issuance of an administrative citation, where the fines and penalties shall be assessed as infractions in accordance with HMC 2.56.110;

2. Issuance of a notice of public nuisance and abatement pursuant to Chapter 8.28 HMC;

3. Imposition of criminal and civil penalties, including those in Chapter 1.24 HMC; and

4. Immediate confiscation and impoundment as evidence of the components that are amplifying or transmitting the prohibited noises or the immediate confiscation and impoundment of the motor vehicle to which the component is attached if the same may not be removed without causing harm to the vehicle or the component.

D. Any person claiming legal ownership of a motor vehicle confiscated and impounded under this section may request the return of the vehicle by filing a written request with the police department within seven calendar days of the confiscation. Such requests shall be processed in accordance with procedures adopted by the police department.

E. Any person claiming legal ownership of the items confiscated and impounded under this section, other than a motor vehicle, may request the return of the item by filing a written request with the police department, which shall be processed in accordance with procedures adopted by the police department. (Ord. 370 § 28, 2012; Ord. 324 § 2, 2008)

8.50.050 Controlled hours of operation.

It shall be unlawful for any person to engage in the following activities at a time other than between the hours of 5:00 a.m. and 10:00 p.m. on any day in the industrial (I) zone, and between the hours of 7:00 a.m. and 10:00 p.m. on any day 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 1,000 feet of a residence.

C. Operate or permit the use of domestic power tools, 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 code enforcement officer.

F. Operate or permit the use of electrically operated compressor(s), fan(s) and other similar device(s).

G. Operate or permit the use of pile driver(s), steam or gasoline shovel(s), pneumatic hammer(s), steam or electric hoist(s) or other similar device(s).

H. Perform ground maintenance on golf course grounds and tennis courts contiguous to golf courses that creates a noise disturbance across a residential or commercial property line.

I. Operate or permit the use of any motor vehicle with a gross vehicle weight rating in excess of 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 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.

J. Repair, rebuild, reconstruct or dismantle any motor vehicle or other mechanical equipment or device(s) in a manner so as to be plainly audible across property lines.

K. Load, unload, open, close or otherwise handle garbage cans, recycling bins or other similar objects between the hours of 10:00 p.m. and 7:00 a.m. the following morning, except city-permitted trash collection. (Ord. 352 § 1, 2010; Ord. 324 § 2, 2008)

8.50.060 Exemptions.

The following activities and noise sources shall not be subject to the provisions of this chapter:

A. Those noise events in the community (e.g., airport noise, arterial traffic noise, railroad noise) that are more accurately measured by application of the general plan noise element policy, utilizing the community noise equivalent level (CNEL) method.

B. Activities conducted on the grounds of any public or private school during regular hours of operation.

C. Outdoor gatherings, public dances, shows and sporting and entertainment events, provided said events are authorized by the city.

D. Legally permitted activities conducted at public places during regular hours of operation.

E. Any mechanical device, apparatus, or equipment used, related to or connected with emergency machinery, vehicle or work.

F. All mechanical devices, apparatus, or equipment which are utilized for the protection or salvage of agricultural crops during periods of potential or actual frost damage or other adverse weather conditions.

G. Mobile noise sounds associated with agricultural operations, provided such operations do not take place between the hours of 10:00 p.m. and 7:00 a.m. on weekdays, including Saturdays, or at any time on Sunday or a state holiday.

H. Mobile noise sources associated with agricultural pest control through pesticide application.

I. Warning devices necessary for the protection of the public safety, including, but not limited to, police, fire and ambulance sirens and train horns and sounds for the purpose of alerting persons to the existence of an emergency.

J. Construction, repair or excavation necessary for the immediate preservation of life or property.

K. Construction, operation, maintenance and repair of equipment, apparatus or facilities of the park and recreation department, public work projects or essential public services and facilities, including trash collection and those of public utilities subject to the regulatory jurisdiction of the Public Utilities Commission.

L. Construction, repair or excavation work performed pursuant to a valid written agreement with the city or any of its political subdivisions, which agreement provides for noise mitigation measures.

M. Any activity, to the extent regulation thereof has been preempted by state or federal law.

N. Any specific activity or noise source governed elsewhere in this code. Such activities include, but are not limited to:

1. Security alarm systems (Chapter 8.04 HMC);

2. Animal noise (Chapter 6.04 HMC);

3. Loud, unruly or disorderly private parties or assemblies (Chapter 9.17 HMC). (Ord. 324 § 2, 2008)

8.50.070 Enforcement and administration.
The city manager, chief of police and/or their designees shall be responsible for administering and enforcing the provisions of this chapter. (Ord. 324 § 2, 2008)

8.50.080 Enforcement – Interference.
No person shall interfere with, oppose, or resist any authorized person charged with the enforcement of this chapter while such person is engaged in the performance of his duty. (Ord. 324 § 3, 2008; Ord. 283 § 4, 2002. Formerly 8.50.140)

8.50.090 Violations – Notices – Abatement.
Violations of this chapter shall be prosecuted in the same manner as other violations of this code; provided, however, in the event of an initial violation of the provisions of this chapter, a written notice shall be given the

alleged violator which specifies the time by which the condition shall be corrected or, where applicable, an application for a permit shall be received by the planning division. No complaint or further action shall be taken in the event the cause of the violation has been removed or the condition abated or fully corrected within the time period specified in the written notice. (Ord. 370 § 29, 2012; Ord. 324 § 3, 2008; Ord. 283 § 4, 2002. Formerly 8.50.150)

8.50.100 Violations – Penalties.
Repealed by Ord. 370. (Ord. 324 § 3, 2008; Ord. 283 § 4, 2002. Formerly 8.50.160)

8.50.110 Violations – Notices – Service – Effect.
In the event the alleged violator cannot be located in order to serve the violation of intention to prosecute, such notice shall be deemed to be given upon mailing such notice by registered or certified mail to the alleged violator at his last known address or at the place where the violation occurred, in which event the specified time period for abating the violation or applying for a variance shall commence on the date of the day following the mailing of such notice. Subsequent violations of the same offense shall result in the immediate filing of a complaint. (Ord. 370 § 30, 2012; Ord. 324 § 3, 2008; Ord. 283 § 4, 2002. Formerly 8.50.170)

8.50.120 Immediate threats to health and welfare.
A. The city manager may order an immediate halt to any sound which exposes any person, except those excluded pursuant to HMC 8.50.060, to continuous sound levels in excess of those described herein. Within two days following the issuance of any such order, the city shall apply to the appropriate court for an injunction to replace the order.

B. No order pursuant to subsection A of this section shall be issued if the only persons exposed to sound levels in excess of those contained herein are exposed as a result of (1) trespassing; (2) an invitation upon private property by the person causing or permitting the sound; or (3) employment by the person or contractor of the person causing or permitting the sound.

C. Any person subject to an order issued pursuant to subsection A of this section shall comply with such order until (1) the sound is brought into compliance with the order, as determined by the city manager; or (2) a judicial order has superseded the order of the city manager. (Ord. 324 § 3, 2008; Ord. 283 § 4, 2002. Formerly 8.50.180)

8.50.130 Administrative citations and costs of second and subsequent responses.
The city manager or his designee, in his/her sole discretion, may prosecute violations of this chapter through the administrative citation process set forth in Chapter 2.56 HMC, in lieu of the criminal or nuisance abatement process. In the case of second and subsequent violations of this chapter, the city may assess a second response service fee in compliance with HMC 9.17.030 through 9.17.060, inclusive. (Ord. 324 § 4, 2008)

8.50.140 Modification, suspension and/or revocation of validly issued city permit and/or city license.
The violation of this chapter by any city permittee or licensee more than twice in any six-calendar-month period, in the course of operating pursuant to a validly issued city permit and/or license, may be grounds for the modification, suspension or revocation of such license subject to normal city processes, in the discretion of the city manager. (Ord. 324 § 4, 2008)

APPENDIX 3.3:

CITY OF HIGHLAND GENERAL PLAN NOISE ELEMENT

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7. Noise Element

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Chapter 7. Noise

INTRODUCTION

Purpose and Function

The everyday activities of residents, visitors and workers have the potential to generate a variety of noise sources in the City of Highland. The San Bernardino International Airport (SBIA) is a public, full-service airport designed to serve the western United States with commercial and cargo air traffic. The SBIA contains and is surrounded by multiple commercial and industrial properties, all of which have the potential to generate noise through their business activities. Highland also generates and draws a significant level of passenger and truck traffic through the City along the major roadways and highways, creating mobile sources of noise that can impact noise-sensitive land uses such as homes and schools.

The Noise Element provides the goals and strategies necessary to ensure an appropriately quiet environment for the residents, employees and visitors in Highland. Since the regulation of transportation noise sources such as roadway and aircraft primarily fall under either state or federal jurisdiction, local land use and development planning decisions are generally made in terms of limiting locations or volumes of such sources, of avoiding development in noise impact zones or in shielding impacted receiver sites.

As development continues, the City shall carefully review proposals to ensure that land uses incompatible with the noise environment are avoided. This Element identifies noise issues within the City and provides goals and policies aimed at minimizing noise conflicts and furthering the public health, safety and welfare.

Element Components

The Noise Element has been organized into three sections:

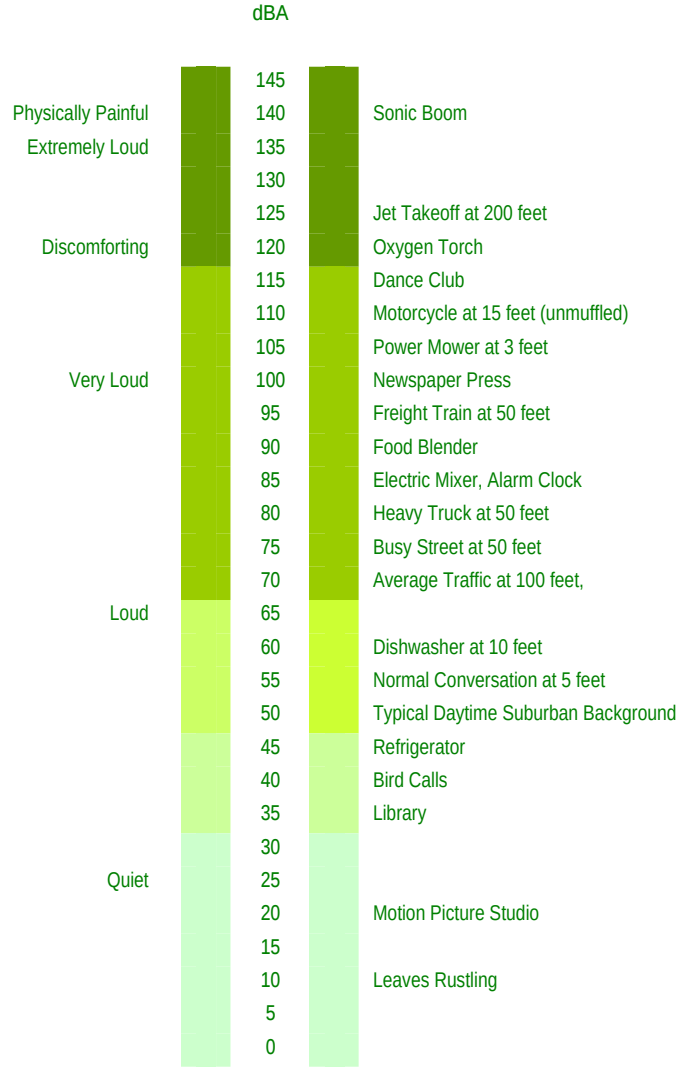
- **Introduction**. This section states the purpose of the Element, provides a brief introduction to the topic of noise and discusses other related plans and programs that affect the noise environment of Highland.
- **Noise Assessment and Modeling**. This section presents the findings and standards of the General Plan noise analysis on the buildout of the General Plan Land Use Plan.
- **Goals and Policies**. This section provides a discussion of noise issues that apply to one area of the City or apply Citywide. Each of the issue discussions is followed by a series of goals and policies.

Understanding Noise

The principal characteristics of sound are its loudness (amplitude) and frequency (pitch). The frequency of a sound is significant because the human ear is not equally sensitive to all frequencies. At low frequencies, characterized as a rumble or roar, the ear is not very sensitive while at higher frequencies, characterized as a screech or a whine, the ear is most sensitive. To reflect this varying sensitivity, an A-weighted decibel scale (dBA) is typically used to measure the perceived loudness of a sound.

Noise refers to sound pressure variations audible to the ear. The audibility of a sound depends on the amplitude and frequency of the sound and the individual's capability to hear the sound. Whether the sound is judged as noise depends largely on the listener's current activity and attitude toward the sound source, as well as the amplitude and frequency of the sound. To obtain convenient measurements and sensitivities at extremely low and high sound pressures, sound is measured in units of the decibel (dB). A listener often judges an increase in sound levels of 10 dBA as a doubling of sound. Examples of the decibel level of various noise sources are shown in Figure 7.1.

Figure 7.1: Noise Levels of Familiar Sources



Ranges and Effects of Noise

The most common sounds vary between 40 dBA (very quiet) and 100 dBA (very loud). Normal conversation at three feet is roughly at 60 dBA, while loud engine noises equate to 110 dBA, which can cause serious discomfort. Physical health, psychological well-being, social cohesion, property values and economic productivity can all be affected by excessive amounts of noise.

The effects of noise on people can be grouped into three general categories: subjective effects, such as annoyance and nuisance; interference with activities such as conversation and sleep; and physiological effects, for example, a startle or hearing loss.

Noise Terminology

dB (Decibel) – The unit of measure that denotes the ratio between two quantities that are proportional to power; the number of decibels corresponding to the ratio of the two amounts of power is based on a logarithmic scale.

dBA (A-weighted decibel) – The A-weighted decibel scale discriminates against upper and lower frequencies in a manner approximating the sensitivity of the human ear. The scale ranges from zero for the least perceptible sound to about 130 for the pain level.

CNEL (Community Noise Equivalent Level) – The average equivalent A-weighted sound level during a 24-hour day, obtained after the addition of five decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and after the addition of 10 decibels to sound levels in the night from 10:00 p.m. to 7:00 a.m. CNEL and Ldn are the metrics used in this document to describe annoyance due to noise and to establish land use planning criteria for noise.

L50 – The A-weighted sound level that is exceeded 50 percent of the sample time. Alternatively, the A-weighted sound level that is exceeded 30 minutes in a 60-minute period (similarly, L10, L25, etc.). These values are typically used to demonstrate compliance with noise restrictions included in the City noise ordinance.

Leq (Equivalent Energy Level) – The average acoustic energy content of noise during the time it lasts. The Leq of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure, no matter what time of day they occur.

Ldn (Day-Night Average Level) – The average equivalent A-weighted sound level during a 24-hour day, obtained after the addition of 10 decibels to sound levels in the night from 10:00 p.m. to 7:00 a.m. Note: CNEL and Ldn represent daily levels of noise exposure averaged on an annual or daily basis, while Leq represents the equivalent energy noise exposure for a shorter time period, typically one hour. CNEL and Ldn are the metrics used in this document to describe annoyance due to noise and to establish land use planning criteria for noise.

Noise Contours – Lines drawn around a noise source indicating equal levels of noise exposure.

Adverse reactions to noise generally increase with an increase in the difference between background or ambient noise and the noise generated from a particularly intrusive source such as a barking dog, traffic, aircraft or industrial operations. In most situations, noise control measures must reduce noise by 5 to 10 dBA in order to effectively lower the perceived sound. Therefore, loud, short duration noises from barking dogs and low-flying aircraft generally have little impact upon the Community Noise Equivalent Level (CNEL) levels of an area, due to the CNEL being a 24-hour weighted average of noise levels.

Managing the Noise Environment

There are a variety of strategies available for managing the City's noise environment and preserving those qualities of peace and quiet that are essential and highly valued community assets. Land use planning, transportation planning, project design mitigation, simple and sophisticated technical fixes, and acoustical barriers can be applied to address community noise compatibility issues.

In areas subject to significant or potentially significant noise impacts, site planning and design standards are geared to provide noise impact mitigation. Other mitigation measures include the use of buffer zones consisting of earthen berms, walls and landscaping between sensitive land uses and roadways and other noise sources. In addition, site planning and building orientation can provide shielding of outdoor living spaces and orient operable windows away from roadways. Effective acoustical materials can also be incorporated into building windows and walls that adequately reduce outdoor noise.

Sensitive Noise Receptors

A series of land uses have been deemed "noise-sensitive" by the State of California. These land uses require a serene environment as part of the overall facility or residential experience. Many of these facilities depend on low levels of sound to promote the well being of the occupants. Land uses deemed noise-sensitive by the State of California include residences, schools, hospitals, rest homes, long-term care and mental care facilities. Highland considers residential dwellings and institutional uses such as hospitals, convalescent homes and churches to be sensitive noise receptors. Activities conducted in proximity to these facilities must consider the noise output and ensure that they don't create unacceptable noise levels that may unduly affect the noise-sensitive uses.

Relatively noise insensitive land uses include retail and office developments. Land uses that are the least impacted by noise include industrial, manufacturing, utilities, agriculture, natural open space, undeveloped land, parking lots, rifle ranges, warehousing, liquid and solid waste facilities, salvage yards and transit terminals.

Related Plans and Program

Other Elements

The Noise Element is most closely related to the Land Use and Airport Elements. The Land Use Element identifies land use patterns and policies to address land use compatibility. The Airport Element addresses comprehensive issues related to the San Bernardino International and Redlands Municipal Airports, including noise.

Municipal Code

The City of Highland Municipal Code sets forth the City's standards, guidelines and procedures concerning the regulation of noise use. Specifically, the Code includes Title 8, Health and Safety, which includes a chapter on noise control, and Title 16, Land Use and Development. Title 8 directly regulates noise while Title 16 lays out land use standards that indirectly regulate noise-generating and sensitive land uses. These regulations are intended to implement the goals, objectives and policies of the General Plan; protect property values and the health and general well being of the public; and ensure that any negative effects of noise are minimized or completely avoided.

The City categorizes land uses into designated noise zones to assign appropriate interior and exterior noise standards. The appropriate interior and exterior noise standards are identified in Tables 7.1 and 7.2, respectively.

Table 7.1: City of Highland Interior Noise Standards

Type of Land Use	*CNEL (dBA)*
Residential	45
Educational/churches, other institutional uses	45
General offices	50
Retail stores, restaurants	55
Manufacturing, warehousing	65
Agricultural	55
Sand and gravel operations	75

Source: Chapter 8.50, Noise Control, City of Highland Municipal Code.

Table 7.2: City of Highland Exterior Noise Standards		
Type of Land Use	*Time Interval*	*CNEL (dBA)*
Residential	10:00 p.m. – 7:00 a.m.	55
	7:00 a.m. – 10:00 p.m.	60
Agricultural/Equestrian	10:00 p.m. – 7:00 a.m.	60
	7:00 a.m. – 10:00 p.m.	65
Commercial	10:00 p.m. – 7:00 a.m.	65
	7:00 a.m. – 10:00 p.m.	70
Manufacturing or Industrial	Any Time	75
Open Space	Any Time	75
Source: Chapter 8.50, Noise Control, City of Highland Municipal Code.		

San Bernardino International Airport Plans

☞ For a more detailed discussion of issues and policies related to the San Bernardino International Airport and Redlands Municipal Airport, please refer to the Airport Element.

The San Bernardino International Airport (SBD), located just outside the City's southern boundary, has the capacity to provide regional air traffic for domestic and international service, both commercial and cargo, along with the necessary support facilities for major and smaller airlines. When adopted, the Airport Master Plan should contain standards and guidelines on the appropriate range and design of land uses within areas impacted by noise emanating from airport operations.

Redlands Municipal Airport Land Use Compatibility Plan

Redlands Municipal Airport (RMA) is a General Aviation facility located south of Highland near the Santa Ana Wash. The Redlands Municipal Airport Land Use Compatibility Plan (LUCP) establishes procedures and criteria by which the City of Redlands can address, evaluate and review airport compatibility issues in the vicinity of the Redlands Municipal Airport. The (LUCP) also serves to alert the City of Highland to the potential effects of air traffic from the Redlands Municipal Airport on land uses in southern Highland.

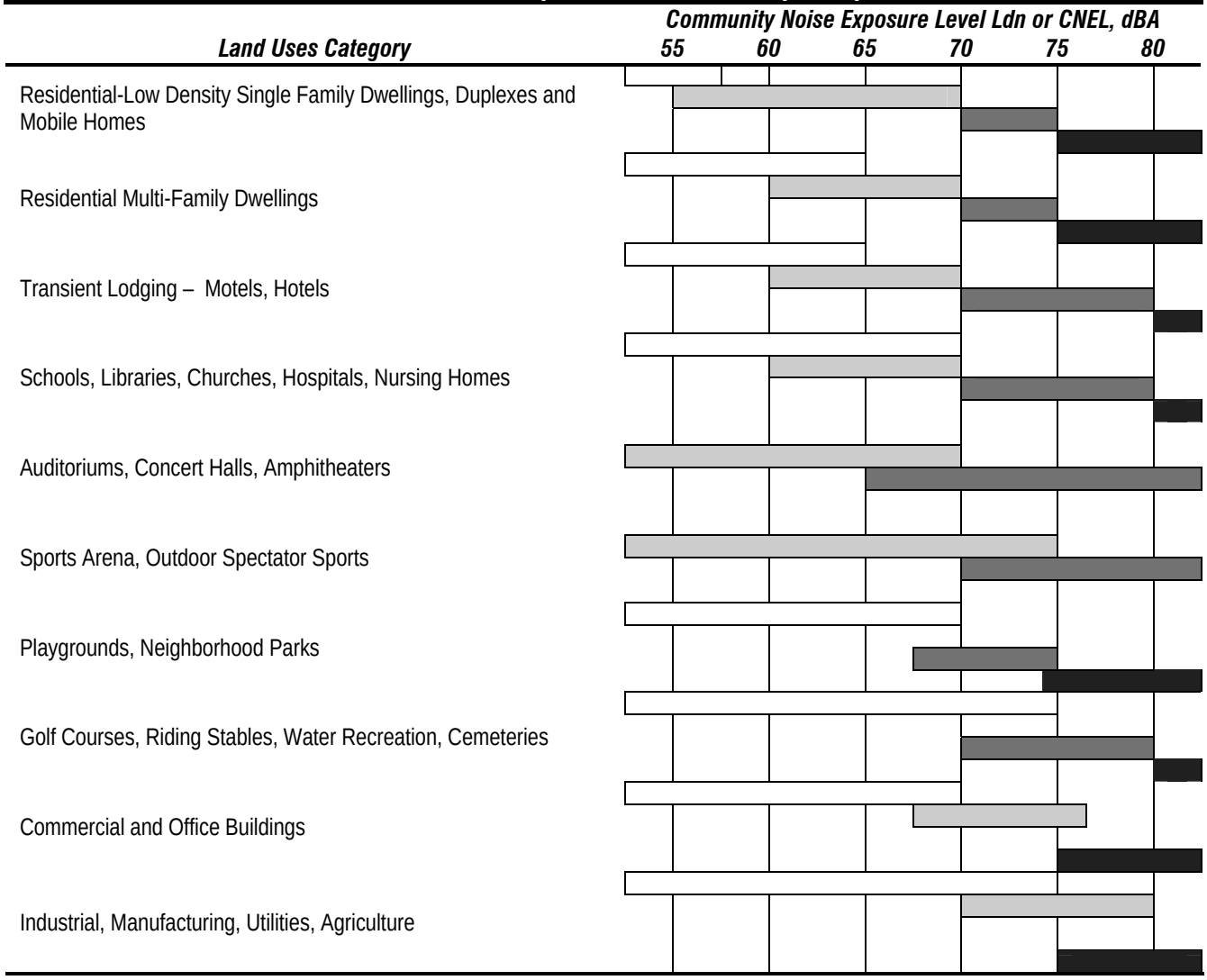
Federal Regulations

State routes and freeways that run through the City are subject to federal funding and, as such, are under the purview of the Federal Highway Administration (FHWA). The FHWA has developed noise standards that are typically used for federally funded roadway projects or projects that require either federal or Caltrans review. The Environmental Protection Agency is charged with the regulation of railroad noise under the Noise Control Act, which is enforced by the Federal Railroad Administration.

California Department of Health Services

The California Department of Health Services (DHS) Office of Noise Control studied the correlation of noise levels and their effects on various land uses. As a result, the DHS established four categories for judging the severity of noise intrusion on specified land uses. Table 7.3 presents a land use compatibility chart for community noise prepared by the California Office of Noise Control to demonstrate land use compatibility. Whereas the interior and exterior noise standards presented in Tables 7.1 and 7.2 provides limits on noise exposure for land uses from those sources of noise under the jurisdiction of the City, Table 7.3 provides planning guidelines for the review and approval of development applications in terms of the compatibility of land uses with the existing and future noise environment.

Table 7.3: Community Noise and Land Use Compatibility



Explanatory Notes

Normally Acceptable:
Specified land use is satisfactory based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.

Conditionally Acceptable:
New construction or development 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 system or air conditioning will normally suffice. Outdoor environment will seem noisy.

Normally Unacceptable:
New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made with needed noise insulation features included in the design. Outdoor areas must be shielded.

Clearly Unacceptable:
New construction or development should generally not be undertaken. Construction cost to make the indoor environment acceptable would be prohibitive and the outdoor environment would not be usable.

Source: California Office of Noise Control

NOISE ASSESSMENT AND MODELING

To understand and evaluate the impacts of land use patterns, traffic and individual developments on the noise environment, the General Plan Environmental Impact Report incorporates a comprehensive noise analysis of existing noise sources and projections of traffic volumes associated with the buildout of the General Plan. Existing and future impacts have been modeled, with projected noise contours for the City's roadways and freeways at buildout presented in Figure 7.2.

Like all highly urbanized areas, the City of Highland is subject to noise from a myriad of sources. The major source of noise is from mobile sources and most specifically, traffic traveling through the City on its various roadways and freeways. Future noise impacts to the community are expected to be primarily generated by increasing traffic volumes.

It is important to note that special attention to project specific site design may substantially reduce noise impacts below those projected; therefore, these estimates are considered to be conservative and unmitigated. A wide range of design criteria affecting roadway engineering and traffic noise abatement include differences in final grade between the roadbed and the top of walls, spacing of intersections, setbacks and parkway widths, roadway composition and other considerations.

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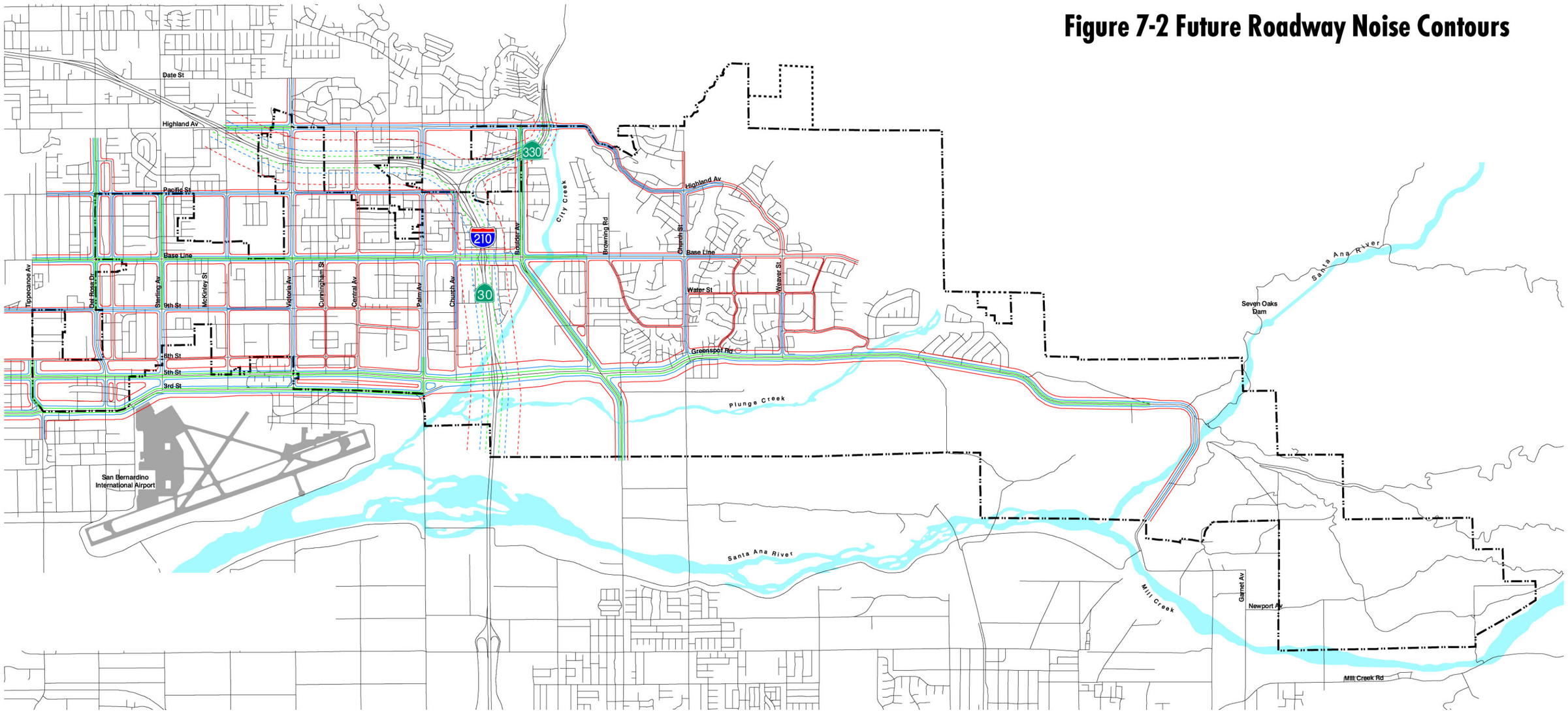
Figure 7-2 Future Roadway Noise Contours



65 CNEL
70 CNEL
75 CNEL
Freeway 65 CNEL
Freeway 70 CNEL
Freeway 75 CNEL
City Boundary
Sphere of Influence

0' 4000'

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GOALS AND POLICIES

This section contains a brief discussion and detailed policy direction for noise issues within Highland. The first issue, Land Use Planning and Design, concerns the relationship between the design and approval of land uses and existing or potential noise sources. The second issue, Transportation Related Noise Sources, considers impacts that can be created by the operation of motor vehicles, trucks, aircraft and railways in the City. Non-Transportation-Related Noise Sources, the third issue, involves noise impacts created by business or residential activities, such as air conditioning units, mining activities, barking dogs or community events. By following the policies associated with each issue, Highland will ensure compatible development, protect noise-sensitive land uses and minimize the effects of excessive and nuisance noise.

In addition to these goals, it is important to note that additional land use direction is provided through other General Plan Elements, the Development Code and redevelopment efforts.

Land Use Planning and Design

As Highland grows, the City's population, employment and commercial activity may generate more traffic and attract additional noise producing uses. In addition, some undeveloped and underdeveloped areas are designated for land uses that may be noise-sensitive and are located in proximity to roadways and transit facilities. For example, along Base Line, mixed-use and medium density residential development is encouraged to stimulate the development of vibrant commercial activity. In addition, some older neighborhoods in the southwestern portion of the City adjacent to the SBIA are currently located in areas that are transitioning to potential noise-generating business park and industrial uses.

As a result, land use compatibility with noise is an important consideration in the planning and design process. To identify potential mitigation to address noise abatement strategies, noise evaluations should be conducted when a proposed project places sensitive land uses and major noise generators within close proximity to each other. The City's Community Development Department currently uses the project review process to identify potential noise issues and works with developers or landowners to apply site planning and other design strategies to reduce noise impacts. A developer, for example, could take advantage of the natural shape and contours of a site to arrange buildings and other uses in a manner that would reduce and possibly eliminate noise impacts. Examples of other site and architectural techniques could include:

- Increasing the distance between noise source and receiver;

- Placing non-noise-sensitive land uses such as parking lots, maintenance facilities and utility areas between the noise source and receiver, while maintaining aesthetic considerations;
- Using non-noise-sensitive structures such as garages to shield noise-sensitive areas;
- Orienting buildings to shield outdoor spaces from a noise source; and
- Locating bedrooms in residential developments on the side of the house facing away from major roads.

GOAL 7.1

Protect sensitive land uses and the citizens of Highland from annoying and excessive noise through diligent planning and regulation.

Policies

1) Enforce the City's Noise Control Ordinance consistent with health and quality of life goals and employ effective techniques of noise abatement through such means as a noise ordinance, building codes and subdivision and zoning regulations.

2) Encourage the use of site planning and architectural techniques such as alternative building orientation and walls combined with landscaping to mitigate noise to levels consistent with interior and exterior noise standards.

3) Require mitigation where sensitive uses are to be placed along transportation routes to ensure compliance with interior and exterior noise standards.

4) Consider the compatibility of proposed land uses with the noise environment when preparing, revising or reviewing development proposals.

5) Prevent the siting of sensitive uses in areas in excess of established 65 dBA CNEL without appropriate mitigation. Special attention should be paid to potential development within the 65 dBA CNEL noise contour of the San Bernardino International Airport and mining operations of the Santa Ana River.

6) Work with San Bernardino International Airport Authority to ensure that future airport planning activities encourage consistency with adopted City land use plans and minimize impacts on Highland's economic development opportunities and quality of life.

7) Require that site-specific noise studies be conducted by a qualified acoustic consultant utilizing acceptable methodologies while reviewing the development of sensitive land uses or development that has the potential to impact sensitive land uses. Also require a site-specific noise study if the proposed development could potentially violate the noise provisions of the General Plan or City ordinance.

Actions

1) Coordinate with school districts to ensure that schools are located and designed so that:

   - interior noise in classrooms does not exceed 45 CNEL
   - noise exposure does not exceed 65 CNEL at classroom buildings; and
   - noise exposure does not exceed 70 CNEL on playgrounds and athletic fields.

2) Coordinate with the San Bernardino International Airport Authority to minimize flight patterns over the City.

3) When site and architectural design features cannot sufficiently reduce adverse noise levels, or cannot be economically provided, require the provision of noise barriers/berms, provided that noise barriers:

   - are sufficiently massive to prevent significant noise transmission and high enough to shield receiver from noise source;
   - noise barriers exhibit a minimum acceptable density of four pounds per square foot (equivalent to 3/4-inch plywood):
   - contain no cracks or openings; and
   - minimize the effect of flanking by bending the barrier back from the noise source at the end of the barrier.

4) Require landscaping treatment to be provided in conjunction with noise barriers to provide visual relief and to reduce aesthetic impacts.

5) Require realtors representing homebuyers in the vicinity of the gun club to inform new buyers of the existence of potential noise impacts associated with gunfire.

6) Maintain a noise complaint file to document areas of excessive noise in the City.

Transportation-Related Noise Sources

Highland's proximity to southern Californian mountains, desert resorts and other cultural and recreational attractions draws a significant level of passenger and truck traffic through the City. The City contains two major highways (State Routes 30 and 330) and a number of major arterials (such as Base Line and 5th Street), and sits next to the San Bernardino International Airport. These transportation facilities, while important components to mobility and economic vitality, are the major contributors of noise in Highland. Cost effective strategies to reduce their influence on the community noise environment are an essential part of the Noise Element.

While local government has little direct control of transportation noise at the source, as these levels are set by state and federal agencies, the City does have some control over transportation noise that exceeds state and/or federal standards through the enforcement of the Municipal Code. The most effective method the City has to mitigate transportation noise is by reducing the impact of the noise onto the community through noise barriers and site design review. The effect of a noise barrier is critically dependent on the distance between the noise source and the receiver. Noise attenuation from barriers occurs when the barrier penetrates the "line of sight" between the source and receiver; the greater the penetration or height of the barrier, the greater the noise reduction. Additional attenuation can be achieved depending upon the source of transportation-related noise.

Roadways

Roadways are one of the biggest sources of noise in the City. Everyday, thousands of vehicles travel through and around Highland. Noise levels along roadways are determined by a number of traffic characteristics. The most important is the average daily traffic levels. Additional factors include the percentage of trucks, vehicle speed, the time distribution of this traffic and gradient of the roadway.

One way the City can control vehicle noise is through speed reduction. A change of just 5 miles per hour can change the resultant noise by approximately 1 to 2 dB. The difference in noise associated with a reduction of 10 miles per hour could be roughly equivalent to reducing the traffic volume by one-half. The City also has some control over traffic-generated noise through weight limitations and the designation of truck routes. Medium trucks (i.e., those with a gross vehicle weight between 5 and 13.25 tons) produce as much acoustical energy as approximately 5 to 16 automobiles depending on the speed, with slower speeds demonstrating greater differential. Similarly, heavy trucks (i.e.,

those with a gross vehicle weight in excess of 13.25 tons) produce as much acoustical energy as 10 to 60 automobiles.

The City can further reduce traffic-generated noise by ensuring that street paving is maintained and bumps and dips are minimized. Poor paving causes vehicles to bounce and this bouncing exacerbates the noise due to the rattling of the vehicle. This is especially important along those routes that realize augmented volumes of truck traffic. Noise contours for the City's roadways and freeways are presented in Figure 7.2. Future conditions consider sound levels given the buildout of land uses and the roadway network, but do not consider sound attenuation measures such as soundwalls.

Aircraft

Highland is subject to the activities of the San Bernardino International Airport (SBIA) and the Redlands Municipal Airport (RMA). Airport operations of the SBIA and RMA are of significant importance to the City of Highland because of their impacts to Highland's safety, physical development and economic welfare. In addition, local helicopter air traffic is commonplace throughout the City. News and other helicopters (e.g., freeway traffic report helicopters) fly through the area. Helicopter use for fire and police services and at local hospitals is considered as an emergency activity and is addressed by FAA regulations.

☞ Specific policy direction on aircraft noise is provided in the Airport Element.

GOAL 7.2

Encourage the reduction of noise from transportation-related noise sources such as automobile and truck traffic.

Policies

1) Guide the location and design of transportation facilities to minimize the exposure of noise on noise-sensitive land uses.

2) Employ noise mitigation practices, as necessary, when designing future streets and highways, and when improvements occur along existing road segments. Mitigation measures should emphasize the establishment of natural buffers or setbacks between the arterial roadways and adjoining noise-sensitive areas.

3) Require that development generating increased traffic and subsequent increases in the ambient noise level adjacent to noise-sensitive land uses provide appropriate mitigation measures.

4) Minimize truck traffic through residential neighborhoods.

5) Encourage the development of alternative transportation modes such as bicycle paths and pedestrian walkways to minimize the number of automobile trips and noise.

Actions

1) Maintain roadways so that the paving is in good condition to reduce noise-generating cracks, bumps and potholes.

2) Use the daily design capacity identified in the General Plan and the posted speed limit to quantify the design noise levels adjacent to transportation routes for mitigation purposes.

3) Require evaluation of highway and arterial roadway extensions for potential noise impacts on existing and future land uses.

4) Consider the effects of truck routes, truck traffic, posted speed limits and future motor vehicle volumes on noise levels adjacent to transportation routes when planning improvements to the circulation system.

5) Work with Caltrans to landscape or install mitigation elements along freeways and highways adjacent to existing residential subdivisions or noise-sensitive uses to beautify the landscape and reduce noise, where appropriate.

6) Monitor proposals for future transit systems and require noise control to be considered in the selection of transportation systems that may affect the City.

Non-Transportation-Related Noise Sources

The City currently maintains a diversity of land uses, most of which generate their own noise. Noise from one land use can "spill over" into other uses and can potentially create undesirable noise impacts. Industrial facilities generate noise through various processes that involve the use of heavy equipment and machinery. However, even commercial facilities and residential units can generate noise from the use of heating, ventilating and air conditioning (HVAC) units.

Restaurants, bars and entertainment establishments may use sound amplification equipment that operates well into the night. Residential areas are also subject to noise from the use of landscape maintenance equipment, barking dogs, etc. Mixed-use areas that place residential uses alongside or above commercial uses can present their own challenges. Requiring that the commercial component meet a residential standard could make commercial operations difficult.

Alternatively, applying a commercial standard to a mixed-use project could result in unacceptable noise levels at the residential portion of the structure/site. Still, mixed-use projects offer several advantages from both an air quality and transportation perspective, and should be encouraged.

One major stationary noise generator associated with mining and processing of sand and gravel operations is located southeast of the City's boundary. Noise generated from the gravel pit is produced by the use of vehicles and aggregate processing equipment. Vehicles include bulldozers, loaders and other heavy machinery, as well as heavy trucks used to load finished aggregate products for delivery via public roadways. Low frequency noise source emissions can be reduced by modifying equipment.

Noise emissions from mineral extraction activities are most heavily concentrated within the processing area. A combination of individual point noise sources and a diffuse collection of mobile equipment are the primary cause for the noise observed in the nearest residential neighborhoods north of the sand and gravel operations.

GOAL 7.3

Protect residents from the effects of "spill over" or nuisance noise.

Policies

1) Enforce the City's Noise Control Ordinance so that new projects located in commercial or entertainment areas do not exceed stationary-source noise standards at the property line of proximate residential or commercial uses, as appropriate.

2) Prohibit new industrial uses from exceeding commercial or residential stationary-source noise standards at the most proximate land uses, as appropriate. (Industrial noise may spill over to proximate industrial uses so long as the combined noise does not exceed the appropriate industrial standards.)

3) Require that construction activities employ feasible and practical techniques to minimize noise impacts on adjacent uses. Particular emphasis shall be placed on the restriction of hours in which work other than emergency work may occur.

4) Require that the hours of truck deliveries to commercial properties abutting residential uses be limited unless there is no feasible alternative or there are overriding transportation benefits by scheduling deliveries at another hour.

5) Ensure that buildings are constructed to prevent adverse noise transmission between differing uses located in the same structure and individual residences in multi-family buildings.

Actions

1) As a condition of approval, limit non-emergency construction activities adjacent to existing noise-sensitive uses to daylight hours between 7:00 a.m. and 6:00 p.m. Discourage construction on weekends or holidays except in the case of construction proximate to schools where these operations could disturb the classroom environment.

2) Ensure that the design and placement of air conditioning units and pool equipment within residential areas is accomplished in a manner that does not intrude upon the peace and quiet of adjacent noise-sensitive uses.

3) Encourage the use of portable noise barriers for heavy equipment operations performed within 100 feet of existing residences or make applicant provide evidence as to why the use of such barriers is infeasible.

APPENDIX 5.1:

STUDY AREA PHOTOS

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JN: 13635 Study Area Photos

L1_E
34, 6' 37.840000", 117, 15' 22.190000"

L1_N
34, 6' 37.840000", 117, 15' 22.190000"

L1_S
34, 6' 37.810000", 117, 15' 22.160000"

L1_W
34, 6' 37.790000", 117, 15' 22.160000"

L2_E
34, 6' 36.870000", 117, 14' 55.390000"

L2_N
34, 6' 36.870000", 117, 14' 55.390000"

JN: 13635 Study Area Photos

L2_S
34, 6' 36.870000", 117, 14' 55.390000"

L2_W
34, 6' 36.850000", 117, 14' 55.360000"

L3_E
34, 6' 37.200000", 117, 13' 55.730000"

L3_N
34, 6' 37.070000", 117, 13' 55.810000"

L3_S
34, 6' 37.200000", 117, 13' 55.730000"

L3_W
34, 6' 37.110000", 117, 13' 55.810000"

L4_E
34, 6' 45.890000", 117, 13' 2.230000"

L4_N
34, 6' 45.620000", 117, 13' 2.340000"

L4_S
34, 6' 45.970000", 117, 13' 2.310000"

L4_W
34, 6' 46.030000", 117, 13' 2.420000"

L5_E
34, 6' 36.800000", 117, 13' 1.620000"

L5_N
34, 6' 36.800000", 117, 13' 1.620000"

L5_S
34, 6' 36.770000", 117, 13' 1.680000"

L5_W
34, 6' 36.770000", 117, 13' 1.700000"

L6_E
34, 6' 38.060000", 117, 12' 12.240000"

L6_N
34, 6' 38.060000", 117, 12' 12.240000"

L6_S
34, 6' 38.050000", 117, 12' 12.240000"

L6_W
34, 6' 38.050000", 117, 12' 12.240000"

JN: 13635 Study Area Photos

L7_E
34, 6' 17.570000", 117, 15' 34.830000"

L7_N
34, 6' 17.380000", 117, 15' 35.320000"

L7_S
34, 6' 17.500000", 117, 15' 34.800000"

L7_W
34, 6' 17.490000", 117, 15' 34.830000"

L8_E
34, 6' 37.390000", 117, 15' 40.430000"

L8_N
34, 6' 36.550000", 117, 15' 41.170000"

JN: 13635 Study Area Photos

L8_S
34, 6' 37.470000", 117, 15' 40.400000"

L8_W
34, 6' 37.490000", 117, 15' 40.430000"

APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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24-Hour Noise Level Measurement Summary

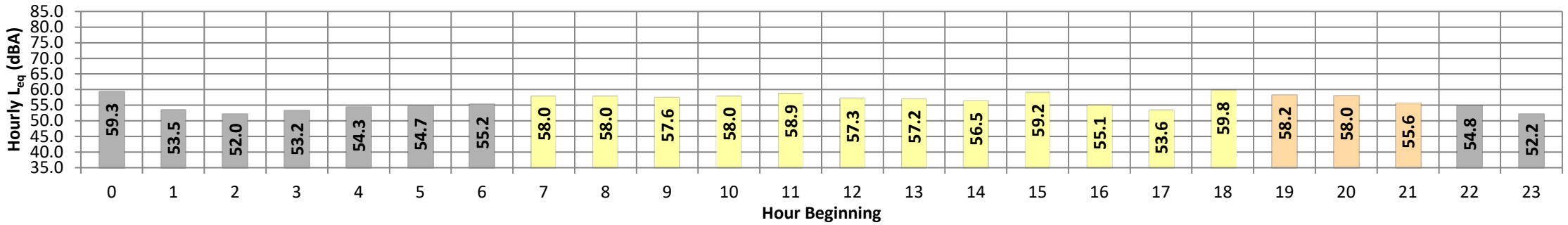
Date: Wednesday, September 09, 2020
Project: Airport Gateway Specific Plan

Location: L1 - Located north of the Project site in Indian Springs High School at 650 N Del Rosa Drive.

Meter: Piccolo II

JN: 13635
Analyst: P. Mara

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	59.3	68.7	60.3	68.1	67.7	66.8	66.0	62.5	61.3	60.6	60.5	60.4	59.3	10.0	69.3
	1	53.5	60.7	49.5	59.9	59.3	58.0	57.2	53.8	51.8	50.1	49.9	49.6	53.5	10.0	63.5
	2	52.0	55.7	50.5	55.3	55.0	54.2	53.5	52.3	51.6	50.8	50.7	50.5	52.0	10.0	62.0
	3	53.2	57.8	50.6	57.4	57.0	56.3	55.8	53.8	52.3	51.0	50.9	50.7	53.2	10.0	63.2
	4	54.3	60.6	51.3	60.1	59.5	58.0	57.1	54.4	53.3	51.9	51.6	51.4	54.3	10.0	64.3
	5	54.7	59.0	52.3	58.6	58.2	57.5	57.1	55.3	54.0	52.9	52.7	52.4	54.7	10.0	64.7
	6	55.2	61.8	52.3	61.2	60.9	60.4	59.7	54.5	53.7	52.7	52.6	52.4	55.2	10.0	65.2
Day	7	58.0	67.1	52.4	66.5	66.2	65.4	64.3	55.6	54.3	52.9	52.7	52.5	58.0	0.0	58.0
	8	58.0	67.4	49.4	67.2	66.9	66.1	64.7	55.4	52.1	49.9	49.7	49.5	58.0	0.0	58.0
	9	57.6	67.2	51.2	66.5	66.1	64.7	63.8	55.6	53.7	51.7	51.5	51.3	57.6	0.0	57.6
	10	58.0	67.2	49.8	66.9	66.4	65.1	64.0	57.5	53.2	50.7	50.3	49.9	58.0	0.0	58.0
	11	58.9	69.2	51.4	68.6	68.2	67.5	66.0	54.5	53.4	52.0	51.8	51.5	58.9	0.0	58.9
	12	57.3	67.2	50.0	66.6	66.3	65.5	63.9	53.8	52.4	50.7	50.4	50.1	57.3	0.0	57.3
	13	57.2	66.2	50.7	65.7	65.3	64.5	63.2	56.1	53.4	51.4	51.1	50.8	57.2	0.0	57.2
	14	56.5	67.0	48.3	66.2	65.9	65.1	63.5	52.3	50.7	49.0	48.8	48.4	56.5	0.0	56.5
	15	59.2	70.2	48.9	69.9	69.6	67.3	65.1	55.3	52.3	49.7	49.3	49.0	59.2	0.0	59.2
	16	55.1	64.9	47.7	64.3	64.0	62.0	60.1	54.4	51.2	48.6	48.2	47.8	55.1	0.0	55.1
	17	53.6	62.5	47.1	62.1	61.6	59.9	58.0	53.5	50.5	47.9	47.5	47.2	53.6	0.0	53.6
	18	59.8	72.3	49.1	71.8	70.7	67.3	63.9	57.3	53.3	49.9	49.6	49.2	59.8	0.0	59.8
Evening	19	58.2	66.8	52.9	66.4	66.0	64.2	62.4	58.0	55.5	53.5	53.3	53.0	58.2	5.0	63.2
	20	58.0	63.2	55.8	62.9	62.5	61.5	60.6	58.1	57.0	56.3	56.2	55.9	58.0	5.0	63.0
	21	55.6	60.4	52.1	59.9	59.4	58.5	58.1	56.3	55.0	52.6	52.4	52.2	55.6	5.0	60.6
Night	22	54.8	61.3	51.4	60.7	60.2	59.0	57.8	55.1	53.5	51.9	51.7	51.5	54.8	10.0	64.8
	23	52.2	55.9	49.9	55.3	54.9	54.2	53.8	52.8	51.9	50.6	50.3	50.1	52.2	10.0	62.2

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	53.6	62.5	47.1	62.1	61.6	59.9	58.0	52.3	50.5	47.9	47.5	47.2
	Max	59.8	72.3	52.4	71.8	70.7	67.5	66.0	57.5	54.3	52.9	52.7	52.5
Energy Average		57.7	Average:		66.9	66.4	65.0	63.4	55.1	52.5	50.4	50.1	49.8
Evening	Min	55.6	60.4	52.1	59.9	59.4	58.5	58.1	56.3	55.0	52.6	52.4	52.2
	Max	58.2	66.8	55.8	66.4	66.0	64.2	62.4	58.1	57.0	56.3	56.2	55.9
Energy Average		57.4	Average:		63.1	62.6	61.4	60.4	57.5	55.8	54.1	53.9	53.7
Night	Min	52.0	55.7	49.5	55.3	54.9	54.2	53.5	52.3	51.6	50.1	49.9	49.6
	Max	59.3	68.7	60.3	68.1	67.7	66.8	66.0	62.5	61.3	60.6	60.5	60.4
Energy Average		54.9	Average:		59.6	59.2	58.3	57.6	54.9	53.7	52.5	52.3	52.1

L_{eq} (dBA)

24-Hour	*Daytime*	*Nighttime*
56.8	**57.7**	**54.9**

24-Hour CNEL (dBA)

62.3

24-Hour Noise Level Measurement Summary

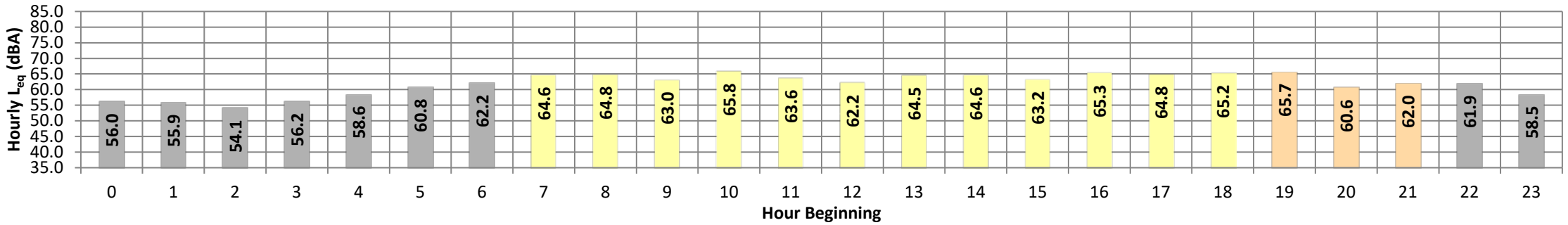
Date: Wednesday, September 09, 2020
Project: Airport Gateway Specific Plan

Location: L2 - Located north of the Project site on 6th Street near existing single family residential home at 7891 Bonnie Street.

Meter: Piccolo II

JN: 13635
Analyst: P. Mara

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	56.0	68.8	45.0	68.4	67.5	63.8	60.7	50.3	47.2	45.6	45.4	45.1	56.0	10.0	66.0
	1	55.9	68.7	46.8	68.3	67.3	63.0	59.2	52.0	49.3	47.5	47.2	46.9	55.9	10.0	65.9
	2	54.1	64.1	49.8	63.8	63.0	59.4	56.6	53.0	51.7	50.4	50.2	50.0	54.1	10.0	64.1
	3	56.2	67.7	49.7	67.3	66.5	63.0	60.0	53.7	51.8	50.3	50.0	49.7	56.2	10.0	66.2
	4	58.6	69.9	51.8	69.6	68.7	65.0	61.7	56.4	54.9	52.5	52.2	51.9	58.6	10.0	68.6
	5	60.8	72.0	54.1	71.6	70.8	67.4	64.7	58.5	56.7	54.8	54.5	54.2	60.8	10.0	70.8
	6	62.2	73.1	56.2	72.5	71.6	68.1	65.8	60.8	58.8	57.0	56.7	56.3	62.2	10.0	72.2
Day	7	64.6	75.3	58.3	74.7	73.8	71.0	68.6	63.3	60.9	59.0	58.7	58.3	64.6	0.0	64.6
	8	64.8	73.2	62.2	72.7	71.8	68.8	66.9	64.3	63.5	62.6	62.5	62.3	64.8	0.0	64.8
	9	63.0	73.7	54.7	73.4	72.8	70.2	68.0	61.0	58.0	55.5	55.2	54.9	63.0	0.0	63.0
	10	65.8	78.5	54.1	78.1	77.1	73.4	70.1	61.8	57.7	55.0	54.6	54.2	65.8	0.0	65.8
	11	63.6	76.1	51.9	75.6	74.7	71.0	68.1	60.4	56.2	52.8	52.4	52.0	63.6	0.0	63.6
	12	62.2	74.2	52.3	73.8	73.0	69.5	66.7	59.2	55.5	53.2	52.8	52.5	62.2	0.0	62.2
	13	64.5	76.9	52.0	76.5	75.6	72.4	69.5	60.5	56.0	52.9	52.5	52.1	64.5	0.0	64.5
	14	64.6	75.8	52.9	75.4	74.7	72.5	70.7	61.3	57.6	54.3	53.7	53.2	64.6	0.0	64.6
	15	63.2	75.9	47.3	75.3	74.0	70.4	68.1	61.0	54.9	48.5	48.0	47.5	63.2	0.0	63.2
	16	65.3	78.5	47.5	77.7	76.2	72.7	70.2	62.1	55.7	48.7	48.2	47.7	65.3	0.0	65.3
	17	64.8	77.1	49.0	76.7	75.7	72.2	69.8	62.1	55.4	51.0	50.3	49.4	64.8	0.0	64.8
	18	65.2	75.6	54.4	75.2	74.4	71.4	69.6	64.7	61.7	57.1	56.0	54.6	65.2	0.0	65.2
Evening	19	65.7	78.7	53.6	78.1	76.9	72.8	69.6	62.6	59.1	55.0	54.3	53.8	65.7	5.0	70.7
	20	60.6	72.6	48.2	72.2	71.3	68.1	65.6	58.1	52.8	49.2	48.8	48.4	60.6	5.0	65.6
	21	62.0	74.2	51.1	73.7	72.7	69.1	67.1	58.8	54.5	52.0	51.7	51.3	62.0	5.0	67.0
Night	22	61.9	74.1	47.2	73.6	72.8	69.9	67.7	58.3	52.3	48.1	47.7	47.4	61.9	10.0	71.9
	23	58.5	70.5	46.7	70.0	69.1	66.2	63.6	55.8	51.4	47.8	47.2	46.9	58.5	10.0	68.5

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	62.2	73.2	47.3	72.7	71.8	68.8	66.7	59.2	54.9	48.5	48.0	47.5
	Max	65.8	78.5	62.2	78.1	77.1	73.4	70.7	64.7	63.5	62.6	62.5	62.3
Energy Average		64.4	Average:		75.4	74.5	71.3	68.8	61.8	57.7	54.2	53.7	53.2
Evening	Min	60.6	72.6	48.2	72.2	71.3	68.1	65.6	58.1	52.8	49.2	48.8	48.4
	Max	65.7	78.7	53.6	78.1	76.9	72.8	69.6	62.6	59.1	55.0	54.3	53.8
Energy Average		63.3	Average:		74.7	73.6	70.0	67.4	59.8	55.5	52.1	51.6	51.2
Night	Min	54.1	64.1	45.0	63.8	63.0	59.4	56.6	50.3	47.2	45.6	45.4	45.1
	Max	62.2	74.1	56.2	73.6	72.8	69.9	67.7	60.8	58.8	57.0	56.7	56.3
Energy Average		59.1	Average:		69.5	68.6	65.1	62.2	55.4	52.7	50.4	50.1	49.8

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
62.9	64.2	59.1

24-Hour CNEL (dBA)
67.2

24-Hour Noise Level Measurement Summary

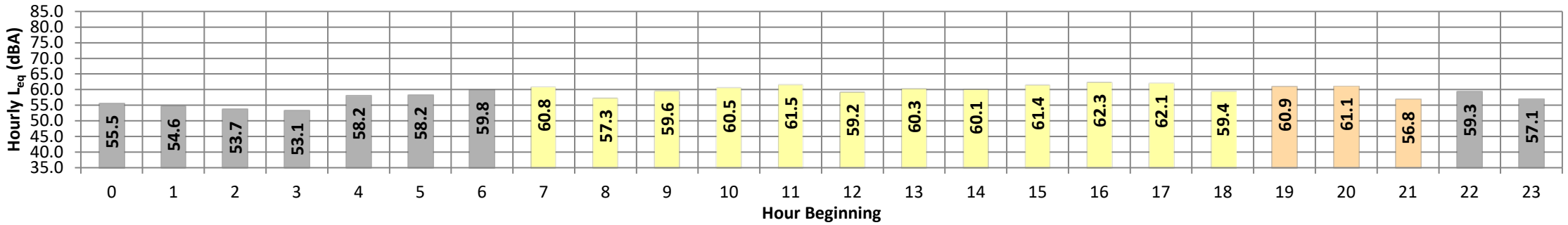
Date: Wednesday, September 09, 2020
Project: Airport Gateway Specific Plan

Location: L3 - Located north of the Project site on 6th Street near existing single-family residential home at 7904 Roberts Street.

Meter: Piccolo II

JN: 13635
Analyst: P. Mara

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	55.5	68.2	43.3	67.7	66.8	63.4	60.4	50.4	45.9	43.9	43.6	43.4	55.5	10.0	65.5
	1	54.6	76.7	45.2	75.3	73.3	68.2	64.2	51.5	47.3	45.8	45.6	45.3	54.6	10.0	64.6
	2	53.7	66.6	44.9	66.2	65.3	61.1	57.1	48.7	46.9	45.5	45.3	45.0	53.7	10.0	63.7
	3	53.1	64.0	45.3	63.6	62.9	59.8	57.3	52.2	48.8	46.0	45.7	45.4	53.1	10.0	63.1
	4	58.2	69.8	51.3	69.3	68.3	64.9	62.1	56.3	53.1	51.9	51.7	51.4	58.2	10.0	68.2
	5	58.2	70.3	48.3	69.9	69.1	65.9	63.2	54.1	51.2	49.0	48.7	48.4	58.2	10.0	68.2
	6	59.8	71.6	50.0	71.1	70.1	67.0	64.9	57.1	53.5	50.9	50.5	50.1	59.8	10.0	69.8
Day	7	60.8	72.9	51.2	72.3	71.3	67.9	65.8	58.0	54.2	52.0	51.7	51.3	60.8	0.0	60.8
	8	57.3	69.1	45.8	68.7	67.8	64.8	62.4	55.0	49.7	46.5	46.2	45.9	57.3	0.0	57.3
	9	59.6	70.5	45.3	70.1	69.4	66.9	65.0	58.3	52.5	47.1	46.3	45.4	59.6	0.0	59.6
	10	60.5	73.2	47.1	72.7	71.5	68.0	64.9	57.5	52.5	48.2	47.7	47.2	60.5	0.0	60.5
	11	61.5	71.9	50.0	71.5	70.8	68.6	66.9	60.6	56.2	51.7	51.0	50.2	61.5	0.0	61.5
	12	59.2	70.5	47.8	70.0	69.0	66.0	64.0	58.4	53.8	49.3	48.6	48.0	59.2	0.0	59.2
	13	60.3	71.9	46.8	71.3	70.5	67.8	65.6	58.4	53.5	48.5	47.8	46.9	60.3	0.0	60.3
	14	60.1	72.3	46.0	71.7	70.7	67.4	64.9	57.7	52.4	47.4	46.8	46.2	60.1	0.0	60.1
	15	61.4	72.8	46.6	72.4	71.5	68.9	67.0	59.4	53.0	48.3	47.7	46.9	61.4	0.0	61.4
	16	62.3	73.8	45.8	73.1	72.4	70.0	68.2	60.9	53.4	47.3	46.7	46.0	62.3	0.0	62.3
	17	62.1	74.1	44.7	73.6	72.6	69.6	67.5	60.2	52.1	45.9	45.5	44.9	62.1	0.0	62.1
	18	59.4	71.4	43.1	71.0	70.0	67.0	64.9	56.8	48.9	44.3	43.8	43.2	59.4	0.0	59.4
Evening	19	60.9	73.3	45.1	72.7	71.7	68.4	65.8	58.7	52.0	46.2	45.8	45.2	60.9	5.0	65.9
	20	61.1	74.2	44.0	73.8	72.8	69.0	65.4	56.2	49.3	45.1	44.7	44.1	61.1	5.0	66.1
	21	56.8	69.0	43.5	68.5	67.5	64.5	62.2	53.5	48.3	44.5	44.1	43.6	56.8	5.0	61.8
Night	22	59.3	71.4	44.0	70.9	70.0	67.2	64.7	56.2	49.3	45.0	44.6	44.2	59.3	10.0	69.3
	23	57.1	69.2	43.6	68.9	68.2	65.1	62.4	52.3	46.6	44.3	44.0	43.7	57.1	10.0	67.1

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	57.3	69.1	43.1	68.7	67.8	64.8	62.4	55.0	48.9	44.3	43.8	43.2
	Max	62.3	74.1	51.2	73.6	72.6	70.0	68.2	60.9	56.2	52.0	51.7	51.3
Energy Average		60.6	Average:		71.5	70.6	67.7	65.6	58.4	52.7	48.0	47.5	46.9
Evening	Min	56.8	69.0	43.5	68.5	67.5	64.5	62.2	53.5	48.3	44.5	44.1	43.6
	Max	61.1	74.2	45.1	73.8	72.8	69.0	65.8	58.7	52.0	46.2	45.8	45.2
Energy Average		60.0	Average:		71.7	70.7	67.3	64.5	56.2	49.9	45.3	44.9	44.3
Night	Min	53.1	64.0	43.3	63.6	62.9	59.8	57.1	48.7	45.9	43.9	43.6	43.4
	Max	59.8	76.7	51.3	75.3	73.3	68.2	64.9	57.1	53.5	51.9	51.7	51.4
Energy Average		57.2	Average:		69.2	68.2	64.7	61.8	53.2	49.2	46.9	46.6	46.3

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
59.5	60.5	57.2

24-Hour CNEL (dBA)
64.7

24-Hour Noise Level Measurement Summary

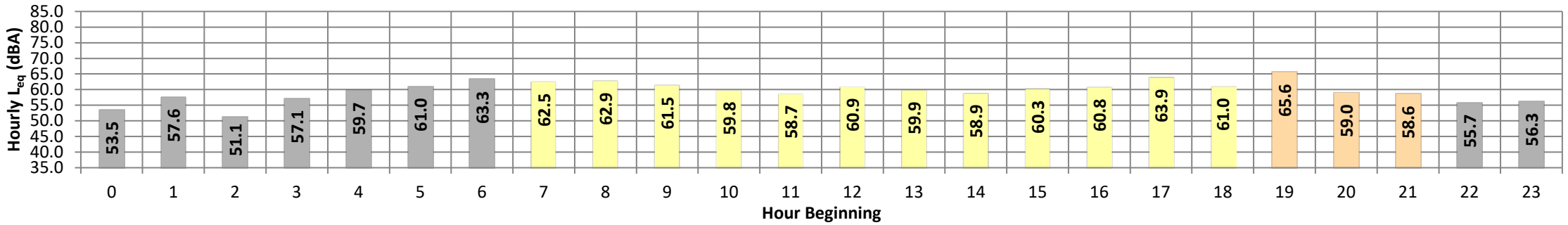
Date: Wednesday, September 09, 2020
Project: Airport Gateway Specific Plan

Location: L4 - Located north of the Project site on Central Avenue near the Highland Family YMCA at 7793 Central Avenue.

Meter: Piccolo II

JN: 13635
Analyst: P. Mara

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	53.5	64.2	47.3	63.9	63.3	60.5	58.0	51.9	48.9	47.6	47.5	47.4	53.5	10.0	63.5
	1	57.6	69.8	49.8	69.2	68.4	64.5	62.1	53.9	51.2	50.2	50.0	49.9	57.6	10.0	67.6
	2	51.1	61.2	45.4	60.9	60.2	57.6	55.6	49.4	47.6	46.1	45.9	45.5	51.1	10.0	61.1
	3	57.1	68.7	47.8	68.3	67.6	64.8	61.9	54.8	50.4	48.5	48.1	47.9	57.1	10.0	67.1
	4	59.7	71.4	50.8	71.1	70.4	67.5	64.5	56.4	52.9	51.2	51.0	50.8	59.7	10.0	69.7
	5	61.0	72.2	50.7	71.9	71.3	68.5	65.8	58.7	54.7	51.6	51.2	50.8	61.0	10.0	71.0
	6	63.3	75.5	50.1	75.0	73.9	71.4	68.4	59.8	55.9	51.2	50.8	50.2	63.3	10.0	73.3
Day	7	62.5	73.9	52.2	73.6	73.0	70.0	67.1	60.3	56.2	53.1	52.8	52.4	62.5	0.0	62.5
	8	62.9	74.6	49.1	74.3	73.5	70.4	67.7	60.8	55.3	50.6	49.8	49.2	62.9	0.0	62.9
	9	61.5	71.8	47.1	71.4	70.9	68.9	67.2	60.9	54.3	48.6	47.9	47.3	61.5	0.0	61.5
	10	59.8	71.6	46.7	71.2	70.3	67.3	64.7	57.7	51.7	47.7	47.2	46.8	59.8	0.0	59.8
	11	58.7	69.4	46.2	69.1	68.3	65.7	63.9	57.9	52.4	47.1	46.7	46.3	58.7	0.0	58.7
	12	60.9	72.8	44.7	72.4	71.5	68.3	65.7	59.4	52.7	46.1	45.5	44.9	60.9	0.0	60.9
	13	59.9	71.3	45.3	70.8	70.1	67.2	65.0	58.5	51.9	46.4	45.9	45.5	59.9	0.0	59.9
	14	58.9	70.2	45.7	69.8	69.0	66.0	64.1	57.7	52.0	46.8	46.2	45.8	58.9	0.0	58.9
	15	60.3	70.6	51.2	70.2	69.5	67.1	65.1	59.8	55.5	52.0	51.7	51.3	60.3	0.0	60.3
	16	60.8	72.5	47.0	72.0	71.0	67.5	65.7	59.7	54.2	48.5	47.8	47.2	60.8	0.0	60.8
	17	63.9	74.8	46.3	74.5	74.0	72.0	69.7	61.7	56.1	48.1	47.2	46.5	63.9	0.0	63.9
	18	61.0	72.6	46.0	72.1	71.1	68.3	65.8	59.7	54.3	48.0	47.0	46.2	61.0	0.0	61.0
Evening	19	65.6	79.2	47.6	78.8	77.8	73.3	69.3	59.3	54.2	49.3	48.6	47.8	65.6	5.0	70.6
	20	59.0	70.9	44.3	70.5	69.6	66.5	64.1	56.6	51.1	45.7	45.0	44.5	59.0	5.0	64.0
	21	58.6	70.0	45.8	69.6	68.9	66.2	63.4	57.1	51.4	47.2	46.6	45.9	58.6	5.0	63.6
Night	22	55.7	66.6	44.8	66.2	65.6	62.9	61.2	53.9	49.3	45.9	45.5	44.9	55.7	10.0	65.7
	23	56.3	68.8	44.4	68.3	67.5	64.6	61.1	50.7	47.7	45.1	44.8	44.5	56.3	10.0	66.3

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	58.7	69.4	44.7	69.1	68.3	65.7	63.9	57.7	51.7	46.1	45.5	44.9
	Max	63.9	74.8	52.2	74.5	74.0	72.0	69.7	61.7	56.2	53.1	52.8	52.4
Energy Average		61.2	Average:		71.8	71.0	68.2	66.0	59.5	53.9	48.6	48.0	47.4
Evening	Min	58.6	70.0	44.3	69.6	68.9	66.2	63.4	56.6	51.1	45.7	45.0	44.5
	Max	65.6	79.2	47.6	78.8	77.8	73.3	69.3	59.3	54.2	49.3	48.6	47.8
Energy Average		62.3	Average:		72.9	72.1	68.7	65.6	57.7	52.2	47.4	46.8	46.1
Night	Min	51.1	61.2	44.4	60.9	60.2	57.6	55.6	49.4	47.6	45.1	44.8	44.5
	Max	63.3	75.5	50.8	75.0	73.9	71.4	68.4	59.8	55.9	51.6	51.2	50.8
Energy Average		58.6	Average:		68.3	67.6	64.7	62.1	54.4	51.0	48.6	48.3	48.0

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
60.6	61.4	58.6

24-Hour CNEL (dBA)
66.1

24-Hour Noise Level Measurement Summary

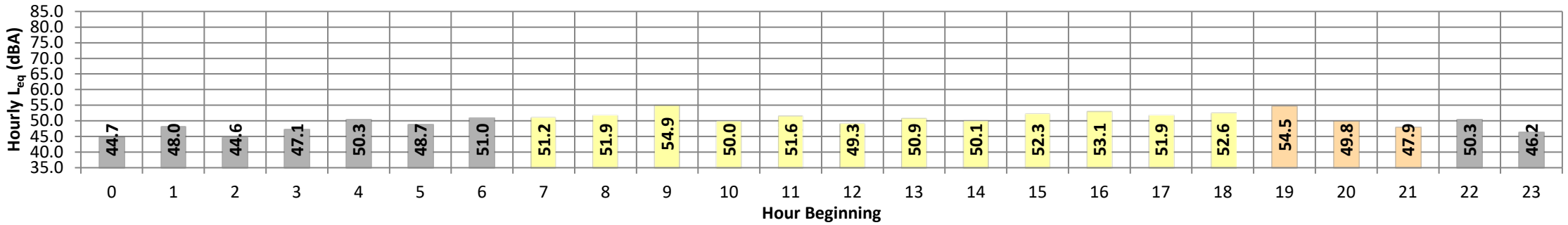
Date: Wednesday, September 09, 2020
Project: Airport Gateway Specific Plan

Location: L5 - Located north of the Project site by the Highland Branch Library at 7863 Central Avenue.

Meter: Piccolo II

JN: 13635
Analyst: P. Mara

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	44.7	51.2	41.4	50.8	50.3	49.0	47.8	44.8	43.4	42.0	41.8	41.5	44.7	10.0	54.7
	1	48.0	57.1	42.7	56.8	56.2	54.1	52.2	47.2	45.0	43.4	43.1	42.8	48.0	10.0	58.0
	2	44.6	50.3	41.5	49.9	49.5	48.2	47.4	45.1	43.6	42.2	41.9	41.6	44.6	10.0	54.6
	3	47.1	54.5	41.8	54.0	53.5	52.1	51.2	47.8	44.7	42.4	42.2	41.9	47.1	10.0	57.1
	4	50.3	61.5	42.0	61.1	60.4	57.9	54.3	48.1	44.9	42.7	42.4	42.1	50.3	10.0	60.3
	5	48.7	56.2	43.9	55.8	55.5	54.1	52.7	49.0	46.6	44.7	44.4	44.0	48.7	10.0	58.7
	6	51.0	60.1	44.9	59.8	59.0	57.4	55.5	50.4	47.8	45.7	45.4	45.0	51.0	10.0	61.0
Day	7	51.2	59.8	46.4	59.2	58.7	56.7	54.9	50.9	49.0	47.1	46.8	46.5	51.2	0.0	51.2
	8	51.9	70.6	46.1	69.9	68.9	68.1	66.8	61.4	58.4	47.9	46.7	46.3	51.9	0.0	51.9
	9	54.9	62.7	44.6	62.4	62.0	61.4	60.6	56.0	49.7	45.7	45.3	44.7	54.9	0.0	54.9
	10	50.0	59.3	44.8	58.7	57.8	55.7	53.9	49.7	47.5	45.6	45.2	44.9	50.0	0.0	50.0
	11	51.6	58.9	46.5	58.4	57.8	56.4	55.4	52.0	49.7	47.4	47.0	46.6	51.6	0.0	51.6
	12	49.3	58.0	43.7	57.5	56.9	55.1	53.4	49.2	46.5	44.4	44.1	43.9	49.3	0.0	49.3
	13	50.9	61.9	43.5	61.2	60.5	58.2	56.5	48.4	46.1	44.1	43.9	43.6	50.9	0.0	50.9
	14	50.1	58.4	45.1	58.0	57.4	55.8	53.9	50.2	48.0	45.8	45.5	45.2	50.1	0.0	50.1
	15	52.3	61.9	45.0	61.4	60.7	58.5	57.3	52.2	48.2	45.8	45.4	45.1	52.3	0.0	52.3
	16	53.1	61.5	44.6	61.1	60.6	59.1	57.9	53.5	49.2	45.4	45.1	44.7	53.1	0.0	53.1
	17	51.9	60.2	44.3	59.8	59.2	57.7	56.6	52.3	48.6	45.1	44.7	44.4	51.9	0.0	51.9
	18	52.6	61.2	43.3	60.9	60.5	59.1	57.4	53.4	48.7	44.0	43.7	43.4	52.6	0.0	52.6
Evening	19	54.5	66.2	44.3	65.9	65.4	62.2	58.5	51.7	49.1	45.1	44.7	44.4	54.5	5.0	59.5
	20	49.8	58.5	40.6	58.1	57.8	56.7	55.6	49.2	45.2	41.5	41.1	40.7	49.8	5.0	54.8
	21	47.9	56.8	40.6	56.5	55.9	53.8	52.0	47.9	45.0	41.8	41.3	40.8	47.9	5.0	52.9
Night	22	50.3	60.6	40.5	59.8	59.2	57.8	56.0	47.5	44.4	41.5	41.1	40.7	50.3	10.0	60.3
	23	46.2	54.2	40.4	53.7	53.1	51.9	50.5	46.4	43.9	41.3	40.9	40.5	46.2	10.0	56.2

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	49.3	58.0	43.3	57.5	56.9	55.1	53.4	48.4	46.1	44.0	43.7	43.4
	Max	54.9	70.6	46.5	69.9	68.9	68.1	66.8	61.4	58.4	47.9	47.0	46.6
Energy Average		51.9	Average:		60.7	60.1	58.5	57.1	52.4	49.1	45.7	45.3	44.9
Evening	Min	47.9	56.8	40.6	56.5	55.9	53.8	52.0	47.9	45.0	41.5	41.1	40.7
	Max	54.5	66.2	44.3	65.9	65.4	62.2	58.5	51.7	49.1	45.1	44.7	44.4
Energy Average		51.7	Average:		60.2	59.7	57.6	55.4	49.6	46.4	42.8	42.4	42.0
Night	Min	44.6	50.3	40.4	49.9	49.5	48.2	47.4	44.8	43.4	41.3	40.9	40.5
	Max	51.0	61.5	44.9	61.1	60.4	57.9	56.0	50.4	47.8	45.7	45.4	45.0
Energy Average		48.4	Average:		55.7	55.2	53.6	52.0	47.4	44.9	42.9	42.6	42.3

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
50.9	51.9	48.4

24-Hour CNEL (dBA)
56.0

24-Hour Noise Level Measurement Summary

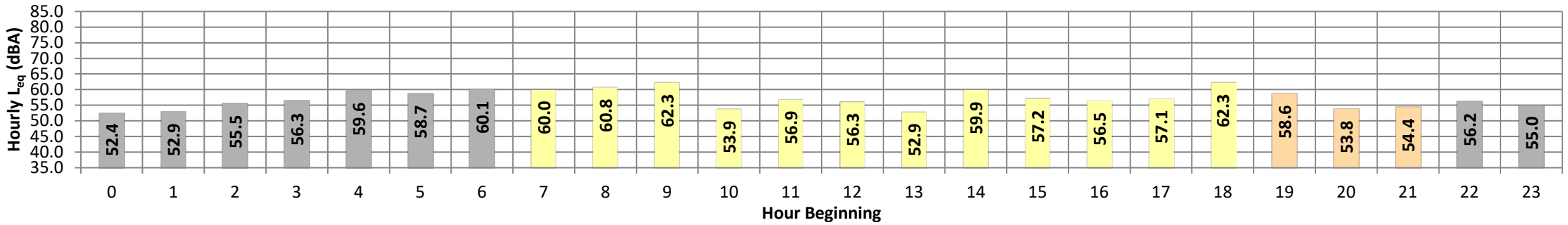
Date: Wednesday, September 09, 2020
Project: Airport Gateway Specific Plan

Location: L6 - Located northeast of the Project site on Powell Drive near existing single-family residential home at 7885 Church Avenue.

Meter: Piccolo II

JN: 13635
Analyst: P. Mara

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	52.4	61.3	47.5	60.9	60.0	57.3	55.6	52.2	50.5	48.2	47.9	47.6	52.4	10.0	62.4
	1	52.9	59.7	48.4	59.1	58.5	57.2	56.4	53.5	51.5	49.3	48.9	48.6	52.9	10.0	62.9
	2	55.5	63.1	51.1	62.7	62.1	60.5	58.9	55.6	53.9	51.9	51.6	51.2	55.5	10.0	65.5
	3	56.3	65.3	50.0	65.0	64.4	62.7	61.0	55.9	53.5	51.0	50.6	50.1	56.3	10.0	66.3
	4	59.6	70.7	52.5	70.2	69.0	65.4	64.0	57.2	55.2	53.3	52.9	52.6	59.6	10.0	69.6
	5	58.7	63.1	55.7	62.7	62.3	61.3	60.7	59.4	58.3	56.5	56.2	55.9	58.7	10.0	68.7
	6	60.1	67.3	56.5	66.8	65.8	63.7	62.5	60.5	59.1	57.3	56.9	56.6	60.1	10.0	70.1
Day	7	60.0	68.7	56.2	68.4	67.6	64.7	62.9	59.6	58.3	56.8	56.5	56.3	60.0	0.0	60.0
	8	60.8	70.8	49.4	70.4	70.0	68.7	67.6	58.4	52.3	50.0	49.8	49.5	60.8	0.0	60.8
	9	62.3	72.8	46.7	72.4	71.9	70.1	68.1	60.6	53.8	47.5	47.2	46.8	62.3	0.0	62.3
	10	53.9	66.1	44.1	65.6	64.8	61.5	58.4	50.1	47.0	44.8	44.5	44.2	53.9	0.0	53.9
	11	56.9	66.7	45.6	66.2	65.5	62.9	61.2	57.2	53.8	46.6	46.1	45.7	56.9	0.0	56.9
	12	56.3	67.4	45.6	67.0	66.1	63.3	60.7	55.2	51.6	47.1	46.1	45.7	56.3	0.0	56.3
	13	52.9	63.2	46.6	62.7	61.9	59.4	56.9	51.6	49.4	47.4	47.1	46.8	52.9	0.0	52.9
	14	59.9	72.1	46.6	71.9	71.3	68.4	64.4	55.3	51.2	47.7	47.3	46.8	59.9	0.0	59.9
	15	57.2	66.7	46.5	66.3	65.8	63.9	62.5	57.2	52.4	47.5	47.1	46.7	57.2	0.0	57.2
	16	56.5	66.3	48.7	65.9	65.2	63.1	61.3	55.8	52.0	49.5	49.2	48.8	56.5	0.0	56.5
	17	57.1	65.8	48.1	65.5	64.9	63.2	62.0	57.7	53.6	49.0	48.7	48.2	57.1	0.0	57.1
	18	62.3	75.7	48.0	75.2	74.0	70.6	66.8	56.4	51.6	48.9	48.6	48.1	62.3	0.0	62.3
Evening	19	58.6	66.6	54.9	66.2	65.3	63.2	61.9	58.7	56.9	55.5	55.3	55.0	58.6	5.0	63.6
	20	53.8	63.9	48.0	63.2	62.6	59.7	57.4	53.5	50.7	48.8	48.5	48.1	53.8	5.0	58.8
	21	54.4	64.6	47.2	64.1	63.2	60.6	58.6	53.8	50.3	48.2	47.7	47.3	54.4	5.0	59.4
Night	22	56.2	67.8	46.3	67.5	67.1	63.8	60.3	52.9	49.5	47.2	46.8	46.4	56.2	10.0	66.2
	23	55.0	65.6	48.7	65.1	63.9	60.8	58.5	54.3	52.1	49.5	49.1	48.9	55.0	10.0	65.0

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	52.9	63.2	44.1	62.7	61.9	59.4	56.9	50.1	47.0	44.8	44.5	44.2
	Max	62.3	75.7	56.2	75.2	74.0	70.6	68.1	60.6	58.3	56.8	56.5	56.3
Energy Average		58.9	Average:		68.1	67.4	65.0	62.7	56.3	52.2	48.6	48.2	47.8
Evening	Min	53.8	63.9	47.2	63.2	62.6	59.7	57.4	53.5	50.3	48.2	47.7	47.3
	Max	58.6	66.6	54.9	66.2	65.3	63.2	61.9	58.7	56.9	55.5	55.3	55.0
Energy Average		56.2	Average:		64.5	63.7	61.2	59.3	55.4	52.7	50.8	50.5	50.2
Night	Min	52.4	59.7	46.3	59.1	58.5	57.2	55.6	52.2	49.5	47.2	46.8	46.4
	Max	60.1	70.7	56.5	70.2	69.0	65.4	64.0	60.5	59.1	57.3	56.9	56.6
Energy Average		57.1	Average:		64.4	63.7	61.4	59.8	55.7	53.7	51.6	51.2	50.9

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
58.0	58.5	57.1

24-Hour CNEL (dBA)

63.9

24-Hour Noise Level Measurement Summary

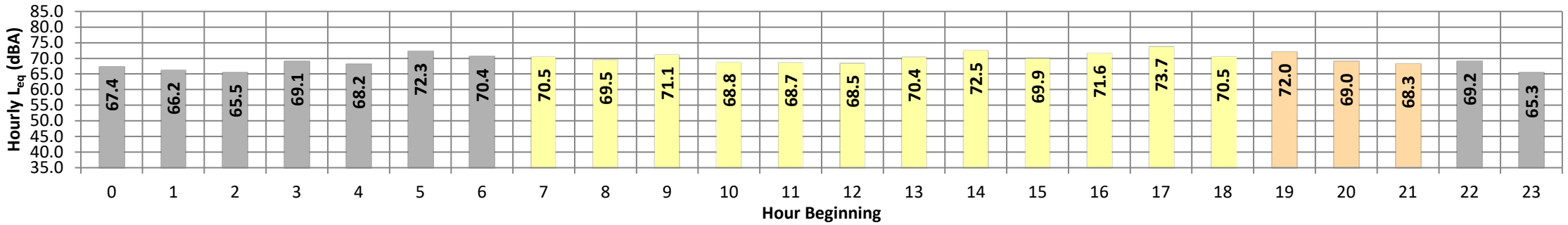
Date: Wednesday, September 09, 2020
Project: Airport Gateway Specific Plan

Location: L7 - Located southwest of the Project site on Tippecanoe Avenue across from Trinity Christian Fellowship Church at 8174 Tippecanoe Avenue.

Meter: Piccolo II

JN: 13635
Analyst: P. Mara

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	67.4	79.5	53.6	79.0	78.1	75.1	72.2	64.8	59.5	54.9	54.2	53.8	67.4	10.0	77.4
	1	66.2	77.0	55.5	76.3	75.5	73.3	71.4	65.5	60.6	56.4	56.0	55.6	66.2	10.0	76.2
	2	65.5	76.1	56.6	75.6	74.9	73.1	71.2	63.4	59.7	57.3	57.0	56.7	65.5	10.0	75.5
	3	69.1	81.0	57.2	80.5	79.5	76.5	74.2	66.2	62.1	58.3	57.8	57.3	69.1	10.0	79.1
	4	68.2	78.3	59.0	77.8	77.0	74.7	72.8	67.8	64.1	60.2	59.6	59.1	68.2	10.0	78.2
	5	72.3	84.6	60.2	84.1	83.0	79.5	76.7	69.2	65.4	61.4	61.0	60.4	72.3	10.0	82.3
	6	70.4	80.8	61.0	80.3	79.7	76.9	74.6	69.9	66.7	62.3	61.6	61.1	70.4	10.0	80.4
Day	7	70.5	80.0	60.7	79.5	78.9	77.0	75.7	70.3	66.3	62.0	61.3	60.8	70.5	0.0	70.5
	8	69.5	79.7	58.7	79.3	78.6	76.2	74.2	68.8	65.4	60.4	59.6	58.8	69.5	0.0	69.5
	9	71.1	82.5	56.9	82.3	81.7	79.1	75.9	68.7	63.8	58.5	57.7	57.1	71.1	0.0	71.1
	10	68.8	79.0	57.7	78.5	77.6	75.4	73.7	68.6	64.3	59.5	58.7	57.9	68.8	0.0	68.8
	11	68.7	79.3	57.4	78.9	78.0	75.1	73.3	68.3	64.0	59.3	58.3	57.5	68.7	0.0	68.7
	12	68.5	79.2	56.8	78.8	77.9	75.3	73.3	67.9	63.5	58.9	57.7	57.0	68.5	0.0	68.5
	13	70.4	82.2	57.4	81.4	80.3	77.1	74.8	69.6	64.7	59.1	58.3	57.6	70.4	0.0	70.4
	14	72.5	85.4	57.6	84.9	83.8	79.9	76.4	69.7	65.0	59.2	58.4	57.8	72.5	0.0	72.5
	15	69.9	79.3	58.5	78.9	78.2	76.5	75.1	70.1	65.9	60.3	59.5	58.7	69.9	0.0	69.9
	16	71.6	83.1	59.6	82.4	81.4	78.2	75.9	70.8	66.9	61.6	60.7	59.8	71.6	0.0	71.6
	17	73.7	86.7	58.7	86.3	85.3	81.2	77.5	70.0	65.9	60.6	59.8	58.9	73.7	0.0	73.7
	18	70.5	81.9	58.8	81.1	80.0	77.2	75.1	69.7	65.3	60.3	59.5	58.9	70.5	0.0	70.5
Evening	19	72.0	84.1	59.4	83.7	82.6	79.3	76.6	69.6	65.9	60.9	60.2	59.6	72.0	5.0	77.0
	20	69.0	79.7	58.1	79.3	78.5	76.2	74.1	67.6	63.7	59.4	58.8	58.3	69.0	5.0	74.0
	21	68.3	79.2	58.5	78.7	77.7	75.3	73.4	66.7	62.9	59.7	59.2	58.6	68.3	5.0	73.3
Night	22	69.2	80.7	57.1	80.4	79.6	76.8	74.1	66.2	62.6	58.8	58.1	57.4	69.2	10.0	79.2
	23	65.3	75.9	55.4	75.4	74.5	71.8	70.2	64.8	60.4	56.6	56.1	55.6	65.3	10.0	75.3

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	68.5	79.0	56.8	78.5	77.6	75.1	73.3	67.9	63.5	58.5	57.7	57.0
	Max	73.7	86.7	60.7	86.3	85.3	81.2	77.5	70.8	66.9	62.0	61.3	60.8
Energy Average		70.8	Average:		81.0	80.2	77.3	75.1	69.4	65.1	60.0	59.1	58.4
Evening	Min	68.3	79.2	58.1	78.7	77.7	75.3	73.4	66.7	62.9	59.4	58.8	58.3
	Max	72.0	84.1	59.4	83.7	82.6	79.3	76.6	69.6	65.9	60.9	60.2	59.6
Energy Average		70.1	Average:		80.6	79.6	76.9	74.7	67.9	64.2	60.0	59.4	58.8
Night	Min	65.3	75.9	53.6	75.4	74.5	71.8	70.2	63.4	59.5	54.9	54.2	53.8
	Max	72.3	84.6	61.0	84.1	83.0	79.5	76.7	69.9	66.7	62.3	61.6	61.1
Energy Average		68.8	Average:		78.8	78.0	75.3	73.0	66.4	62.3	58.5	57.9	57.4

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
70.0	70.6	68.8

24-Hour CNEL (dBA)
75.8

24-Hour Noise Level Measurement Summary

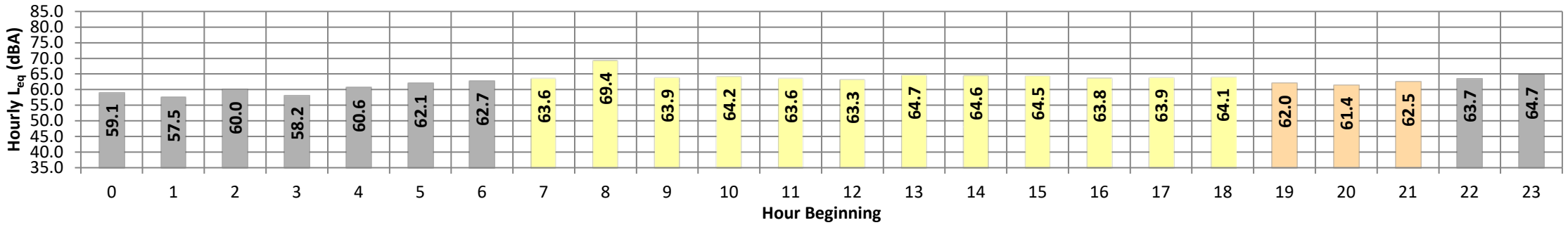
Date: Wednesday, September 09, 2020
Project: Airport Gateway Specific Plan

Location: L8 - Located northwest of the Project site on 6th Street and Tippecanoe Avenue.

Meter: Piccolo II

JN: 13635
Analyst: P. Mara

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	59.1	69.7	47.4	69.3	68.8	67.0	65.1	56.6	52.1	48.4	48.0	47.6	59.1	10.0	69.1
	1	57.5	69.2	47.7	68.8	68.1	65.0	62.2	54.6	51.2	48.4	48.2	47.8	57.5	10.0	67.5
	2	60.0	70.8	49.5	70.5	70.1	67.9	65.8	56.7	53.3	50.3	50.0	49.6	60.0	10.0	70.0
	3	58.2	68.1	49.4	67.8	67.4	65.4	63.8	56.8	52.9	50.4	50.0	49.5	58.2	10.0	68.2
	4	60.6	71.4	49.9	71.2	70.7	68.6	65.4	58.6	54.6	51.2	50.6	50.0	60.6	10.0	70.6
	5	62.1	73.8	51.2	73.3	72.3	69.5	67.2	59.9	55.4	52.1	51.7	51.3	62.1	10.0	72.1
	6	62.7	73.0	51.4	72.7	72.3	70.1	67.8	61.7	57.1	52.5	52.0	51.5	62.7	10.0	72.7
Day	7	63.6	71.7	53.1	71.3	71.0	69.7	68.6	64.5	60.1	54.3	53.7	53.3	63.6	0.0	63.6
	8	69.4	78.5	56.7	78.3	77.9	76.2	74.6	69.4	65.7	58.6	57.7	56.9	69.4	0.0	69.4
	9	63.9	73.8	54.7	73.3	72.7	70.4	68.1	64.0	60.3	56.0	55.4	54.9	63.9	0.0	63.9
	10	64.2	74.9	52.9	74.4	73.7	71.2	69.3	63.3	58.9	54.6	53.8	53.1	64.2	0.0	64.2
	11	63.6	73.3	54.6	72.9	72.3	70.5	68.7	63.2	59.6	55.9	55.3	54.7	63.6	0.0	63.6
	12	63.3	73.5	53.4	73.1	72.5	70.2	68.1	62.5	59.0	54.9	54.2	53.5	63.3	0.0	63.3
	13	64.7	74.8	54.6	74.2	73.5	71.5	69.8	64.2	60.5	55.9	55.3	54.7	64.7	0.0	64.7
	14	64.6	75.0	53.5	74.5	73.9	71.6	70.2	63.8	58.7	54.8	54.2	53.6	64.6	0.0	64.6
	15	64.5	74.8	54.0	74.4	73.7	71.6	69.8	63.7	59.7	55.3	54.8	54.2	64.5	0.0	64.5
	16	63.8	72.9	53.3	72.6	72.0	70.2	68.6	64.0	60.0	54.9	54.2	53.5	63.8	0.0	63.8
	17	63.9	73.6	52.6	73.2	72.7	70.8	68.9	64.1	59.4	54.0	53.3	52.8	63.9	0.0	63.9
	18	64.1	75.1	50.2	74.5	73.9	71.5	69.3	63.0	58.0	52.3	51.2	50.4	64.1	0.0	64.1
Evening	19	62.0	72.0	50.7	71.6	70.8	69.0	67.4	61.7	57.3	52.4	51.7	51.0	62.0	5.0	67.0
	20	61.4	71.9	48.4	71.6	71.0	68.8	67.0	60.8	55.0	49.9	49.2	48.5	61.4	5.0	66.4
	21	62.5	72.2	51.8	71.8	71.3	69.2	67.6	62.6	57.3	52.7	52.3	51.9	62.5	5.0	67.5
Night	22	63.7	75.3	48.3	74.9	74.2	72.5	70.0	59.3	53.9	49.7	49.0	48.5	63.7	10.0	73.7
	23	64.7	79.1	47.9	78.1	76.8	71.9	67.9	57.8	53.4	49.1	48.5	48.1	64.7	10.0	74.7

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	63.3	71.7	50.2	71.3	71.0	69.7	68.1	62.5	58.0	52.3	51.2	50.4
	Max	69.4	78.5	56.7	78.3	77.9	76.2	74.6	69.4	65.7	58.6	57.7	56.9
Energy Average		64.8	Average:		73.9	73.3	71.3	69.5	64.1	60.0	55.1	54.4	53.8
Evening	Min	61.4	71.9	48.4	71.6	70.8	68.8	67.0	60.8	55.0	49.9	49.2	48.5
	Max	62.5	72.2	51.8	71.8	71.3	69.2	67.6	62.6	57.3	52.7	52.3	51.9
Energy Average		62.0	Average:		71.6	71.0	69.0	67.3	61.7	56.5	51.7	51.0	50.5
Night	Min	57.5	68.1	47.4	67.8	67.4	65.0	62.2	54.6	51.2	48.4	48.0	47.6
	Max	64.7	79.1	51.4	78.1	76.8	72.5	70.0	61.7	57.1	52.5	52.0	51.5
Energy Average		61.6	Average:		71.8	71.2	68.7	66.1	58.0	53.8	50.2	49.8	49.3

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
63.5	64.4	61.6

24-Hour CNEL (dBA)
68.8

APPENDIX 7.1:

OFF-SITE TRAFFIC NOISE CONTOURS

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Waterman Avenue
Road Segment: Baseline Street to 5th Street

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,741	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	2,574	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	27	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	2.69	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-16.15	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-17.87	0.13	-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
Autos:	68.1	66.2	64.4	58.4	67.0	67.6
Medium Trucks:	60.5	59.0	52.6	51.1	59.5	59.8
Heavy Trucks:	64.0	62.6	53.6	54.8	63.2	63.3
Vehicle Noise:	70.1	68.3	65.0	60.5	69.0	69.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	43	93	200	431
CNEL:	46	99	214	462

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Tippecanoe Avenue
Road Segment: Baseline Street to 6th Street

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,006	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,201	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	24	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	44.0	feet
Centerline Dist. to Observer:	44.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	42.626
Medium Trucks:	42.418
Heavy Trucks:	42.439

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.14	0.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.97	0.97	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.70	0.96	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.1	65.2	63.4	57.3	66.0	66.6
Medium Trucks:	59.2	57.7	51.4	49.8	58.3	58.5
Heavy Trucks:	62.3	60.9	51.9	53.1	61.5	61.6
Vehicle Noise:	68.8	67.1	63.9	59.3	67.8	68.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	31	68	146	314
CNEL:	34	73	156	337

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Waterman Avenue
Road Segment: 5th Street to 3rd Street

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,528	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	2,753	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	67	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	37.453
Medium Trucks:	37.216
Heavy Trucks:	37.240

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	2.98	1.78	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-15.86	1.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-17.58	1.82	-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
Autos:	70.1	68.2	66.4	60.3	69.0	69.6
Medium Trucks:	62.5	61.0	54.6	53.1	61.5	61.8
Heavy Trucks:	66.0	64.6	55.6	56.8	65.2	65.3
Vehicle Noise:	72.0	70.3	67.0	62.5	71.0	71.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	58	126	271	583
CNEL:	62	135	290	625

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Tippecanoe Avenue
Road Segment: 6th Street to 3rd Street

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,330	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,433	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	24	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	44.0	feet
Centerline Dist. to Observer:	44.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	42.626
Medium Trucks:	42.418
Heavy Trucks:	42.439

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.37	0.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.20	0.97	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.93	0.96	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.8	65.9	64.2	58.1	66.7	67.3
Medium Trucks:	60.0	58.5	52.1	50.6	59.1	59.3
Heavy Trucks:	63.1	61.7	52.6	53.9	62.2	62.4
Vehicle Noise:	69.6	67.8	64.7	60.0	68.6	69.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	35	76	164	353
CNEL:	38	82	176	379

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Tippecanoe Avenue
Road Segment: 3rd Street to Mill Street
Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,362 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,836 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	67 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	37.453
Medium Trucks:	37.216
Heavy Trucks:	37.240

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.60	1.78	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.24	1.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-17.97	1.82	-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
Autos:	71.6	69.7	68.0	61.9	70.5	71.1
Medium Trucks:	63.8	62.3	56.0	54.4	62.9	63.1
Heavy Trucks:	66.9	65.5	56.4	57.7	66.1	66.2
Vehicle Noise:	73.4	71.7	68.5	63.8	72.4	72.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	72	155	334	720
CNEL:	77	166	359	773

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Tippecanoe Avenue
Road Segment: Orange Show Road/ San Bernardino Avenue to Harriman Place / I-10 WB Ramps
Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,471 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,547 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	67 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	37.453
Medium Trucks:	37.216
Heavy Trucks:	37.240

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.13	1.78	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.70	1.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-18.43	1.82	-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
Autos:	71.2	69.3	67.5	61.4	70.1	70.7
Medium Trucks:	63.4	61.9	55.5	54.0	62.4	62.6
Heavy Trucks:	66.4	65.0	56.0	57.2	65.6	65.7
Vehicle Noise:	72.9	71.2	68.0	63.4	71.9	72.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	67	144	311	670
CNEL:	72	155	334	719

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Tippecanoe Avenue
Road Segment: Mill Street to Orange Show Road /San Bernardino Avenue
Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	32,591 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,259 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.20	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-15.63	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-17.36	0.13	-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
Autos:	70.6	68.7	66.9	60.8	69.5	70.1
Medium Trucks:	62.7	61.2	54.9	53.3	61.8	62.0
Heavy Trucks:	65.8	64.4	55.4	56.6	65.0	65.1
Vehicle Noise:	72.3	70.6	67.4	62.8	71.3	71.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	61	132	284	611
CNEL:	66	141	304	655

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Del Rosa Drive
Road Segment: SR-210 EB Ramps to Highland Avenue
Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,780 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,378 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.83	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-17.00	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-18.73	0.13	-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
Autos:	69.2	67.3	65.5	59.5	68.1	68.7
Medium Trucks:	61.4	59.9	53.5	52.0	60.4	60.7
Heavy Trucks:	64.5	63.0	54.0	55.2	63.6	63.7
Vehicle Noise:	71.0	69.2	66.1	61.4	69.9	70.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	50	107	230	495
CNEL:	53	114	247	531

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing | Project Name: Airport Gateway Specific P
Road Name: Del Rosa Drive | Job Number: 13635
Road Segment: Highland Avenue to Pacific Street

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,645 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,765 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	33.0 feet
Centerline Dist. to Observer:	33.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	32.634
Medium Trucks:	32.362
Heavy Trucks:	32.389

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	1.63	2.68	-1.20	-4.52	0.000	0.000
Medium Trucks:	75.75	-17.21	2.73	-1.20	-4.86	0.000	0.000
Heavy Trucks:	81.57	-18.93	2.73	-1.20	-5.69	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.4	65.5	63.7	57.7	66.3	66.9
Medium Trucks:	60.1	58.6	52.2	50.7	59.1	59.4
Heavy Trucks:	64.2	62.7	53.7	54.9	63.3	63.4
Vehicle Noise:	69.6	67.9	64.4	60.1	68.6	69.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	27	57	123	266
CNEL:	28	61	132	284

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing | Project Name: Airport Gateway Specific P
Road Name: Del Rosa Drive | Job Number: 13635
Road Segment: Baseline Street to 9th Street

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,963 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	996 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.95	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-20.78	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-22.51	0.13	-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
Autos:	65.4	63.5	61.8	55.7	64.3	64.9
Medium Trucks:	57.6	56.1	49.7	48.2	56.6	56.9
Heavy Trucks:	60.7	59.3	50.2	51.5	59.8	59.9
Vehicle Noise:	67.2	65.4	62.3	57.6	66.2	66.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	28	60	129	277
CNEL:	30	64	138	297

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing | Project Name: Airport Gateway Specific P
Road Name: Del Rosa Drive | Job Number: 13635
Road Segment: Pacific Street to Baseline Street

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,318 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,232 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.03	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-19.86	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.59	0.13	-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
Autos:	66.3	64.4	62.7	56.6	65.2	65.9
Medium Trucks:	58.5	57.0	50.7	49.1	57.6	57.8
Heavy Trucks:	61.6	60.2	51.1	52.4	60.7	60.9
Vehicle Noise:	68.1	66.4	63.2	58.5	67.1	67.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	32	69	148	319
CNEL:	34	74	159	343

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing | Project Name: Airport Gateway Specific P
Road Name: Del Rosa Drive | Job Number: 13635
Road Segment: 9th Street to 6th Street

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,871 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	987 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.99	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-20.82	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-22.55	0.13	-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
Autos:	65.4	63.5	61.7	55.7	64.3	64.9
Medium Trucks:	57.6	56.1	49.7	48.1	56.6	56.8
Heavy Trucks:	60.6	59.2	50.2	51.4	59.8	59.9
Vehicle Noise:	67.1	65.4	62.3	57.6	66.1	66.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	28	59	128	275
CNEL:	30	64	137	296

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Del Rosa Drive
Road Segment: 6th Street to 3rd Street
Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,576 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	958 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.12	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-20.95	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-22.68	0.13	-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
Autos:	65.2	63.4	61.6	55.5	64.2	64.8
Medium Trucks:	57.4	55.9	49.6	48.0	56.5	56.7
Heavy Trucks:	60.5	59.1	50.0	51.3	59.6	59.8
Vehicle Noise:	67.0	65.3	62.1	57.4	66.0	66.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	27	58	125	270
CNEL:	29	62	134	290

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Sterling Avenue
Road Segment: 9th Street to 6th Street
Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,609 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,061 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-1.16	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-20.00	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-21.72	0.13	-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
Autos:	64.3	62.4	60.6	54.5	63.2	63.8
Medium Trucks:	56.7	55.1	48.8	47.2	55.7	55.9
Heavy Trucks:	60.2	58.8	49.7	51.0	59.3	59.5
Vehicle Noise:	66.2	64.5	61.2	56.7	65.2	65.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	24	51	111	239
CNEL:	26	55	119	256

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Sterling Avenue
Road Segment: Base Line to 9th Street
Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,368 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,337 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-0.16	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-18.99	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-20.72	0.13	-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
Autos:	65.3	63.4	61.6	55.5	64.2	64.8
Medium Trucks:	57.7	56.1	49.8	48.2	56.7	56.9
Heavy Trucks:	61.2	59.8	50.7	52.0	60.4	60.5
Vehicle Noise:	67.2	65.5	62.2	57.7	66.2	66.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	28	60	129	279
CNEL:	30	64	138	298

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Sterling Avenue
Road Segment: 6th Street to 3rd Street
Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,984 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	698 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-2.98	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-21.81	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-23.54	0.13	-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
Autos:	62.4	60.5	58.8	52.7	61.3	61.9
Medium Trucks:	54.8	53.3	47.0	45.4	53.9	54.1
Heavy Trucks:	58.4	57.0	47.9	49.2	57.5	57.7
Vehicle Noise:	64.4	62.7	59.4	54.8	63.4	63.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	18	39	84	181
CNEL:	19	42	90	194

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Victoria Avenue
Road Segment: Highland Avenue to Pacific Street

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,184 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,218 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	42.626
Medium Trucks:	42.418
Heavy Trucks:	42.439

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-0.56	0.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-19.40	0.97	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-21.12	0.96	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.7	63.8	62.0	56.0	64.6	65.2
Medium Trucks:	58.1	56.6	50.2	48.7	57.1	57.4
Heavy Trucks:	61.6	60.2	51.2	52.4	60.8	60.9
Vehicle Noise:	67.6	65.9	62.6	58.1	66.6	67.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	26	56	122	262
CNEL:	28	60	130	280

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Victoria Avenue
Road Segment: Base Line to 9th Street

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,210 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,121 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	42.626
Medium Trucks:	42.418
Heavy Trucks:	42.439

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.44	0.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-20.27	0.97	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-22.00	0.96	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.8	64.9	63.1	57.0	65.7	66.3
Medium Trucks:	58.9	57.4	51.1	49.5	58.0	58.2
Heavy Trucks:	62.0	60.6	51.6	52.8	61.2	61.3
Vehicle Noise:	68.5	66.8	63.6	59.0	67.5	68.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	30	65	139	300
CNEL:	32	69	149	322

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Victoria Avenue
Road Segment: Pacific Street to Base Line

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,431 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,443 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	42.626
Medium Trucks:	42.418
Heavy Trucks:	42.439

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	0.17	0.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-18.66	0.97	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-20.39	0.96	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.4	64.5	62.8	56.7	65.3	65.9
Medium Trucks:	58.8	57.3	51.0	49.4	57.9	58.1
Heavy Trucks:	62.4	60.9	51.9	53.2	61.5	61.6
Vehicle Noise:	68.4	66.6	63.4	58.8	67.4	67.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	29	63	136	293
CNEL:	31	68	146	314

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Victoria Avenue
Road Segment: 9th Street to 6th Street

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,368 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	837 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	42.626
Medium Trucks:	42.418
Heavy Trucks:	42.439

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.71	0.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-21.54	0.97	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.27	0.96	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.5	63.6	61.8	55.8	64.4	65.0
Medium Trucks:	57.7	56.2	49.8	48.3	56.7	57.0
Heavy Trucks:	60.8	59.3	50.3	51.5	59.9	60.0
Vehicle Noise:	67.3	65.5	62.4	57.7	66.2	66.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	25	53	114	247
CNEL:	26	57	123	265

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: Victoria Avenue
Road Segment: 6th Street to 3rd Street

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,368 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	837 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	42.626
Medium Trucks:	42.418
Heavy Trucks:	42.439

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.71	0.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-21.54	0.97	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-23.27	0.96	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.5	63.6	61.8	55.8	64.4	65.0
Medium Trucks:	57.7	56.2	49.8	48.3	56.7	57.0
Heavy Trucks:	60.8	59.3	50.3	51.5	59.9	60.0
Vehicle Noise:	67.3	65.5	62.4	57.7	66.2	66.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	25	53	114	247
CNEL:	26	57	123	265

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: 6th Street
Road Segment: Del Rosa Drive to Sterling Avenue

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,714 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	471 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-4.69	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	77.72	-23.52	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-25.25	3.57	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.1	62.2	60.5	54.4	63.0	63.6
Medium Trucks:	56.6	55.1	48.7	47.2	55.6	55.9
Heavy Trucks:	60.1	58.7	49.7	50.9	59.3	59.4
Vehicle Noise:	66.1	64.4	61.1	56.5	65.1	65.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	14	30	65	141
CNEL:	15	33	70	151

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: 6th Street
Road Segment: Tippecanoe Avenue to Del Rosa Drive

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,249 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	325 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-6.30	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	77.72	-25.14	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-26.86	3.57	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.5	60.6	58.9	52.8	61.4	62.0
Medium Trucks:	55.0	53.4	47.1	45.5	54.0	54.2
Heavy Trucks:	58.5	57.1	48.0	49.3	57.6	57.8
Vehicle Noise:	64.5	62.8	59.5	54.9	63.5	63.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	11	24	51	110
CNEL:	12	25	55	118

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: 6th Street
Road Segment: Sterling Avenue to Victoria Avenue

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,519 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	352 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-5.96	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	77.72	-24.79	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-26.52	3.57	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.9	61.0	59.2	53.1	61.8	62.4
Medium Trucks:	55.3	53.8	47.4	45.9	54.4	54.6
Heavy Trucks:	58.8	57.4	48.4	49.6	58.0	58.1
Vehicle Noise:	64.8	63.1	59.8	55.3	63.8	64.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	12	25	54	116
CNEL:	12	27	58	124

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: 6th Street
Road Segment: Victoria Avenue to Central Avenue

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,047 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	405 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-5.35	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	77.72	-24.18	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-25.91	3.57	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.5	61.6	59.8	53.8	62.4	63.0
Medium Trucks:	55.9	54.4	48.0	46.5	55.0	55.2
Heavy Trucks:	59.5	58.0	49.0	50.2	58.6	58.7
Vehicle Noise:	65.4	63.7	60.4	55.9	64.4	64.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	13	27	59	127
CNEL:	14	29	63	136

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: 5th Street
Road Segment: E Street to Waterman Avenue

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,083 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,008 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.10	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-17.74	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.46	0.13	-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
Autos:	68.5	66.6	64.8	58.7	67.4	68.0
Medium Trucks:	60.6	59.1	52.8	51.2	59.7	59.9
Heavy Trucks:	63.7	62.3	53.3	54.5	62.9	63.0
Vehicle Noise:	70.2	68.5	65.3	60.7	69.2	69.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	44	95	205	442
CNEL:	47	102	220	475

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: 5th Street
Road Segment: I-215 NB Ramps to E Street

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,975 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,098 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.98	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-15.86	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-17.58	0.13	-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
Autos:	70.3	68.4	66.7	60.6	69.2	69.9
Medium Trucks:	62.5	61.0	54.7	53.1	61.6	61.8
Heavy Trucks:	65.6	64.2	55.1	56.4	64.7	64.9
Vehicle Noise:	72.1	70.4	67.2	62.5	71.1	71.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	59	127	274	590
CNEL:	63	136	294	633

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: 5th Street
Road Segment: Waterman Avenue to Tippecanoe Avenue

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,167 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	917 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	33.0 feet
Centerline Dist. to Observer:	33.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	32.634
Medium Trucks:	32.362
Heavy Trucks:	32.389

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.31	2.68	-1.20	-4.52	0.000	0.000
Medium Trucks:	79.45	-21.14	2.73	-1.20	-4.86	0.000	0.000
Heavy Trucks:	84.25	-22.87	2.73	-1.20	-5.69	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.6	65.7	64.0	57.9	66.5	67.1
Medium Trucks:	59.8	58.3	52.0	50.4	58.9	59.1
Heavy Trucks:	62.9	61.5	52.4	53.7	62.1	62.2
Vehicle Noise:	69.4	67.7	64.5	59.8	68.4	68.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	26	55	119	257
CNEL:	28	59	128	276

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: 5th Street
Road Segment: Tippecanoe Avenue to Del Rosa Drive

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,725 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	873 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	33.0 feet
Centerline Dist. to Observer:	33.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	32.634
Medium Trucks:	32.362
Heavy Trucks:	32.389

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.52	2.68	-1.20	-4.52	0.000	0.000
Medium Trucks:	79.45	-21.36	2.73	-1.20	-4.86	0.000	0.000
Heavy Trucks:	84.25	-23.08	2.73	-1.20	-5.69	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.4	65.5	63.7	57.7	66.3	66.9
Medium Trucks:	59.6	58.1	51.8	50.2	58.7	58.9
Heavy Trucks:	62.7	61.3	52.2	53.5	61.8	62.0
Vehicle Noise:	69.2	67.4	64.3	59.6	68.2	68.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	25	54	115	249
CNEL:	27	57	124	267

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: 5th Street
Road Segment: Sterling Avenue to Victoria Avenue

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,911 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	391 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	33.0 feet
Centerline Dist. to Observer:	33.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	32.634
Medium Trucks:	32.362
Heavy Trucks:	32.389

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-6.01	2.68	-1.20	-4.52	0.000	0.000
Medium Trucks:	79.45	-24.84	2.73	-1.20	-4.86	0.000	0.000
Heavy Trucks:	84.25	-26.57	2.73	-1.20	-5.69	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.9	62.0	60.3	54.2	62.8	63.4
Medium Trucks:	56.1	54.6	48.3	46.7	55.2	55.4
Heavy Trucks:	59.2	57.8	48.8	50.0	58.4	58.5
Vehicle Noise:	65.7	64.0	60.8	56.1	64.7	65.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	15	31	68	146
CNEL:	16	34	73	156

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: 5th Street
Road Segment: Del Rosa Drive to Sterling Avenue

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,595 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	560 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-4.45	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-23.29	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-25.01	0.13	-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
Autos:	62.9	61.0	59.3	53.2	61.8	62.4
Medium Trucks:	55.1	53.6	47.2	45.7	54.1	54.4
Heavy Trucks:	58.2	56.7	47.7	49.0	57.3	57.4
Vehicle Noise:	64.7	62.9	59.8	55.1	63.7	64.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	19	41	88	189
CNEL:	20	44	94	202

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: 5th Street
Road Segment: Victoria Avenue to Central Avenue

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,939 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	994 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.96	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-20.79	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-22.52	0.13	-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
Autos:	65.4	63.5	61.7	55.7	64.3	64.9
Medium Trucks:	57.6	56.1	49.7	48.2	56.6	56.9
Heavy Trucks:	60.7	59.2	50.2	51.5	59.8	59.9
Vehicle Noise:	67.2	65.4	62.3	57.6	66.1	66.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	28	60	128	277
CNEL:	30	64	138	297

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: 5th Street
Road Segment: Central Avenue to Palm Avenue
Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,939 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	994 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.96	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-20.79	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-22.52	0.13	-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
Autos:	65.4	63.5	61.7	55.7	64.3	64.9
Medium Trucks:	57.6	56.1	49.7	48.2	56.6	56.9
Heavy Trucks:	60.7	59.2	50.2	51.5	59.8	59.9
Vehicle Noise:	67.2	65.4	62.3	57.6	66.1	66.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	28	60	128	277
CNEL:	30	64	138	297

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: 3rd Street
Road Segment: Waterman Avenue to Tippecanoe Avenue
Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,460 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,046 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.74	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-20.57	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-22.30	0.13	-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
Autos:	65.6	63.7	62.0	55.9	64.5	65.1
Medium Trucks:	57.8	56.3	49.9	48.4	56.9	57.1
Heavy Trucks:	60.9	59.5	50.4	51.7	60.0	60.2
Vehicle Noise:	67.4	65.7	62.5	57.8	66.4	66.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	29	62	133	286
CNEL:	31	66	143	307

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: 5th Street
Road Segment: Palm Avenue to SR-210 EB Ramps
Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,098 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,610 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.23	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.60	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-18.33	0.13	-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
Autos:	69.6	67.7	65.9	59.9	68.5	69.1
Medium Trucks:	61.8	60.3	53.9	52.4	60.8	61.1
Heavy Trucks:	64.9	63.4	54.4	55.6	64.0	64.1
Vehicle Noise:	71.4	69.6	66.5	61.8	70.3	70.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	53	113	245	527
CNEL:	57	122	262	565

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: 3rd Street
Road Segment: Tippecanoe Avenue to Del Rosa Drive
Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,620 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,562 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.01	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-18.83	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.56	0.13	-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
Autos:	67.4	65.5	63.7	57.7	66.3	66.9
Medium Trucks:	59.6	58.0	51.7	50.1	58.6	58.8
Heavy Trucks:	62.6	61.2	52.2	53.4	61.8	61.9
Vehicle Noise:	69.1	67.4	64.3	59.6	68.1	68.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	37	81	174	374
CNEL:	40	86	186	401

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: 3rd Street
Road Segment: Del Rosa Drive to Sterling Avenue

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,143 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,814 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.66	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-18.18	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.91	0.13	-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
Autos:	68.0	66.1	64.4	58.3	66.9	67.5
Medium Trucks:	60.2	58.7	52.3	50.8	59.3	59.5
Heavy Trucks:	63.3	61.9	52.8	54.1	62.4	62.6
Vehicle Noise:	69.8	68.0	64.9	60.2	68.8	69.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	41	89	192	413
CNEL:	44	96	206	443

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: 3rd Street
Road Segment: Victoria Avenue to Palm Avenue

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,714 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,071 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.63	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-20.47	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-22.19	0.13	-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
Autos:	65.7	63.8	62.1	56.0	64.6	65.2
Medium Trucks:	57.9	56.4	50.0	48.5	57.0	57.2
Heavy Trucks:	61.0	59.6	50.5	51.8	60.1	60.3
Vehicle Noise:	67.5	65.8	62.6	57.9	66.5	66.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	29	63	135	291
CNEL:	31	67	145	312

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: Existing
Road Name: 3rd Street
Road Segment: Sterling Avenue to Victoria Avenue

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,457 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,346 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.64	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-19.48	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.20	0.13	-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
Autos:	66.7	64.8	63.1	57.0	65.6	66.2
Medium Trucks:	58.9	57.4	51.0	49.5	58.0	58.2
Heavy Trucks:	62.0	60.6	51.5	52.8	61.1	61.3
Vehicle Noise:	68.5	66.7	63.6	58.9	67.5	67.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	34	73	157	339
CNEL:	36	78	169	363

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project
Road Name: Waterman Avenue
Road Segment: Baseline Street to 5th Street

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,062 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,606 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	2.74	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-16.09	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-17.82	0.13	-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
Autos:	68.2	66.3	64.5	58.4	67.1	67.7
Medium Trucks:	60.6	59.0	52.7	51.1	59.6	59.8
Heavy Trucks:	64.1	62.7	53.6	54.9	63.3	63.4
Vehicle Noise:	70.1	68.4	65.1	60.6	69.1	69.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	43	94	202	435
CNEL:	47	100	216	466

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project
Road Name: Waterman Avenue
Road Segment: 5th Street to 3rd Street

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,232 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,823 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	67 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	37.453
Medium Trucks:	37.216
Heavy Trucks:	37.240

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	3.09	1.78	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-15.75	1.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-17.47	1.82	-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
Autos:	70.2	68.3	66.5	60.5	69.1	69.7
Medium Trucks:	62.6	61.1	54.7	53.2	61.6	61.9
Heavy Trucks:	66.1	64.7	55.7	56.9	65.3	65.4
Vehicle Noise:	72.1	70.4	67.1	62.6	71.1	71.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	59	128	275	593
CNEL:	64	137	295	635

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project
Road Name: Tippecanoe Avenue
Road Segment: 6th Street to 3rd Street

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,390 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,939 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	42.626
Medium Trucks:	42.418
Heavy Trucks:	42.439

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.94	0.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-17.89	0.97	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.62	0.96	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.1	67.2	65.5	59.4	68.0	68.6
Medium Trucks:	61.3	59.8	53.5	51.9	60.4	60.6
Heavy Trucks:	64.4	63.0	53.9	55.2	63.5	63.7
Vehicle Noise:	70.9	69.2	66.0	61.3	69.9	70.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	43	93	200	432
CNEL:	46	100	215	463

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project
Road Name: Tippecanoe Avenue
Road Segment: Baseline Street to 6th Street

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,152 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,315 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	42.626
Medium Trucks:	42.418
Heavy Trucks:	42.439

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.74	0.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.58	0.97	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.30	0.96	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.5	65.6	63.8	57.7	66.4	67.0
Medium Trucks:	59.6	58.1	51.8	50.2	58.7	58.9
Heavy Trucks:	62.7	61.3	52.3	53.5	61.9	62.0
Vehicle Noise:	69.2	67.5	64.3	59.7	68.2	68.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	33	72	155	333
CNEL:	36	77	166	358

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project
Road Name: Tippecanoe Avenue
Road Segment: 3rd Street to Mill Street

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	38,124 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,812 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	67 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	37.453
Medium Trucks:	37.216
Heavy Trucks:	37.240

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.88	1.78	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-14.95	1.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-16.68	1.82	-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
Autos:	72.9	71.0	69.3	63.2	71.8	72.4
Medium Trucks:	65.1	63.6	57.2	55.7	64.2	64.4
Heavy Trucks:	68.2	66.8	57.7	59.0	67.3	67.5
Vehicle Noise:	74.7	72.9	69.8	65.1	73.7	74.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	88	189	407	877
CNEL:	94	203	437	941

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project | Project Name: Airport Gateway Specific P
Road Name: Tippecanoe Avenue | Job Number: 13635
Road Segment: Mill Street to Orange Show Road /San Bernardino Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	42,353	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	4,235	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	27	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	4.34	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-14.50	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-16.22	0.13	-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
Autos:	71.7	69.8	68.0	62.0	70.6	71.2
Medium Trucks:	63.9	62.4	56.0	54.5	62.9	63.2
Heavy Trucks:	67.0	65.5	56.5	57.8	66.1	66.2
Vehicle Noise:	73.5	71.7	68.6	63.9	72.4	72.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	73	157	338	727
CNEL:	78	168	362	780

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project | Project Name: Airport Gateway Specific P
Road Name: Del Rosa Drive | Job Number: 13635
Road Segment: SR-210 EB Ramps to Highland Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,080	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	2,608	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	27	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.23	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.60	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-18.33	0.13	-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
Autos:	69.6	67.7	65.9	59.9	68.5	69.1
Medium Trucks:	61.8	60.3	53.9	52.4	60.8	61.1
Heavy Trucks:	64.9	63.4	54.4	55.6	64.0	64.1
Vehicle Noise:	71.4	69.6	66.5	61.8	70.3	70.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	53	113	244	527
CNEL:	56	122	262	565

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project | Project Name: Airport Gateway Specific P
Road Name: Tippecanoe Avenue | Job Number: 13635
Road Segment: Orange Show Road/ San Bernardino Avenue to Harriman Place / I-10 WB Ramps

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	35,233	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	3,523	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	67	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	37.453
Medium Trucks:	37.216
Heavy Trucks:	37.240

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.54	1.78	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-15.30	1.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-17.02	1.82	-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
Autos:	72.6	70.7	68.9	62.9	71.5	72.1
Medium Trucks:	64.8	63.3	56.9	55.4	63.8	64.1
Heavy Trucks:	67.8	66.4	57.4	58.6	67.0	67.1
Vehicle Noise:	74.3	72.6	69.5	64.8	73.3	73.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	83	179	386	832
CNEL:	89	192	414	893

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project | Project Name: Airport Gateway Specific P
Road Name: Del Rosa Drive | Job Number: 13635
Road Segment: Highland Avenue to Pacific Street

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,945	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,995	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	14	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	33.0	feet
Centerline Dist. to Observer:	33.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	32.634
Medium Trucks:	32.362
Heavy Trucks:	32.389

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	2.16	2.68	-1.20	-4.52	0.000	0.000
Medium Trucks:	75.75	-16.68	2.73	-1.20	-4.86	0.000	0.000
Heavy Trucks:	81.57	-18.40	2.73	-1.20	-5.69	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.9	66.0	64.3	58.2	66.8	67.4
Medium Trucks:	60.6	59.1	52.7	51.2	59.7	59.9
Heavy Trucks:	64.7	63.3	54.2	55.5	63.8	64.0
Vehicle Noise:	70.1	68.4	65.0	60.6	69.1	69.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	29	62	134	288
CNEL:	31	66	143	308

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project | Project Name: Airport Gateway Specific P
Road Name: Del Rosa Drive | Job Number: 13635
Road Segment: Pacific Street to Baseline Street

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,618 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,462 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.28	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-19.12	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.84	0.13	-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
Autos:	67.1	65.2	63.4	57.4	66.0	66.6
Medium Trucks:	59.3	57.8	51.4	49.9	58.3	58.5
Heavy Trucks:	62.3	60.9	51.9	53.1	61.5	61.6
Vehicle Noise:	68.8	67.1	64.0	59.3	67.8	68.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	36	77	166	358
CNEL:	38	83	178	384

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project | Project Name: Airport Gateway Specific P
Road Name: Del Rosa Drive | Job Number: 13635
Road Segment: 9th Street to 6th Street

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,379 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,638 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.21	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-18.62	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.35	0.13	-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
Autos:	67.6	65.7	63.9	57.9	66.5	67.1
Medium Trucks:	59.8	58.3	51.9	50.3	58.8	59.0
Heavy Trucks:	62.8	61.4	52.4	53.6	62.0	62.1
Vehicle Noise:	69.3	67.6	64.5	59.8	68.3	68.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	39	83	179	386
CNEL:	41	89	192	414

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project | Project Name: Airport Gateway Specific P
Road Name: Del Rosa Drive | Job Number: 13635
Road Segment: Baseline Street to 9th Street

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,471 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,647 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.24	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-18.60	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.33	0.13	-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
Autos:	67.6	65.7	63.9	57.9	66.5	67.1
Medium Trucks:	59.8	58.3	51.9	50.4	58.8	59.1
Heavy Trucks:	62.9	61.4	52.4	53.6	62.0	62.1
Vehicle Noise:	69.4	67.6	64.5	59.8	68.3	68.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	39	84	180	388
CNEL:	42	90	193	416

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project | Project Name: Airport Gateway Specific P
Road Name: Del Rosa Drive | Job Number: 13635
Road Segment: 6th Street to 3rd Street

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,560 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,156 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.30	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-20.14	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.86	0.13	-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
Autos:	66.1	64.2	62.4	56.3	65.0	65.6
Medium Trucks:	58.2	56.7	50.4	48.8	57.3	57.5
Heavy Trucks:	61.3	59.9	50.9	52.1	60.5	60.6
Vehicle Noise:	67.8	66.1	62.9	58.3	66.8	67.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	31	66	142	306
CNEL:	33	71	152	328

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project
Road Name: Sterling Avenue
Road Segment: Base Line to 9th Street

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,806	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,681	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	27	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	0.83	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-18.00	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-19.73	0.13	-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
Autos:	66.3	64.4	62.6	56.5	65.2	65.8
Medium Trucks:	58.6	57.1	50.8	49.2	57.7	57.9
Heavy Trucks:	62.2	60.8	51.7	53.0	61.3	61.5
Vehicle Noise:	68.2	66.5	63.2	58.7	67.2	67.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	32	70	151	325
CNEL:	35	75	161	347

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project
Road Name: Sterling Avenue
Road Segment: 6th Street to 3rd Street

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,366	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,437	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	27	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	0.15	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-18.68	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-20.41	0.13	-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
Autos:	65.6	63.7	61.9	55.9	64.5	65.1
Medium Trucks:	58.0	56.5	50.1	48.6	57.0	57.2
Heavy Trucks:	61.5	60.1	51.1	52.3	60.7	60.8
Vehicle Noise:	67.5	65.8	62.5	58.0	66.5	66.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	29	63	136	292
CNEL:	31	67	145	313

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project
Road Name: Sterling Avenue
Road Segment: 9th Street to 6th Street

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,775	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,278	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	27	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-0.36	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-19.19	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-20.92	0.13	-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
Autos:	65.1	63.2	61.4	55.3	64.0	64.6
Medium Trucks:	57.5	56.0	49.6	48.0	56.5	56.7
Heavy Trucks:	61.0	59.6	50.5	51.8	60.2	60.3
Vehicle Noise:	67.0	65.3	62.0	57.5	66.0	66.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	27	58	125	270
CNEL:	29	62	134	289

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project
Road Name: Victoria Avenue
Road Segment: Highland Avenue to Pacific Street

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,944	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,694	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	24	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	44.0	feet
Centerline Dist. to Observer:	44.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	42.626
Medium Trucks:	42.418
Heavy Trucks:	42.439

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	0.87	0.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-17.96	0.97	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-19.69	0.96	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.1	65.2	63.5	57.4	66.0	66.6
Medium Trucks:	59.5	58.0	51.7	50.1	58.6	58.8
Heavy Trucks:	63.1	61.6	52.6	53.9	62.2	62.3
Vehicle Noise:	69.1	67.3	64.1	59.5	68.1	68.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	33	70	151	326
CNEL:	35	75	162	349

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project
Road Name: Victoria Avenue
Road Segment: Pacific Street to Base Line

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,687	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,969	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	24	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	44.0	feet
Centerline Dist. to Observer:	44.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	42.626
Medium Trucks:	42.418
Heavy Trucks:	42.439

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	1.52	0.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-17.31	0.97	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-19.04	0.96	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.8	65.9	64.1	58.0	66.7	67.3
Medium Trucks:	60.2	58.7	52.3	50.8	59.2	59.5
Heavy Trucks:	63.7	62.3	53.3	54.5	62.9	63.0
Vehicle Noise:	69.7	68.0	64.7	60.2	68.7	69.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	36	78	167	361
CNEL:	39	83	179	386

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project
Road Name: Victoria Avenue
Road Segment: 9th Street to 6th Street

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,624	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,362	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	24	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	44.0	feet
Centerline Dist. to Observer:	44.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	42.626
Medium Trucks:	42.418
Heavy Trucks:	42.439

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.59	0.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.42	0.97	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.15	0.96	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.6	65.7	63.9	57.9	66.5	67.1
Medium Trucks:	59.8	58.3	51.9	50.4	58.8	59.1
Heavy Trucks:	62.9	61.4	52.4	53.7	62.0	62.1
Vehicle Noise:	69.4	67.6	64.5	59.8	68.3	68.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	34	74	158	341
CNEL:	37	79	170	366

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project
Road Name: Victoria Avenue
Road Segment: Base Line to 9th Street

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,466	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,647	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	24	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	44.0	feet
Centerline Dist. to Observer:	44.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	42.626
Medium Trucks:	42.418
Heavy Trucks:	42.439

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.23	0.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-18.60	0.97	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.33	0.96	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.4	66.5	64.8	58.7	67.3	67.9
Medium Trucks:	60.6	59.1	52.7	51.2	59.7	59.9
Heavy Trucks:	63.7	62.3	53.2	54.5	62.8	63.0
Vehicle Noise:	70.2	68.5	65.3	60.6	69.2	69.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	39	83	180	387
CNEL:	42	90	193	416

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project
Road Name: Victoria Avenue
Road Segment: 6th Street to 3rd Street

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,436	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	944	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	24	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	44.0	feet
Centerline Dist. to Observer:	44.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	42.626
Medium Trucks:	42.418
Heavy Trucks:	42.439

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.18	0.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-21.02	0.97	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-22.74	0.96	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.0	64.1	62.3	56.3	64.9	65.5
Medium Trucks:	58.2	56.7	50.3	48.8	57.2	57.5
Heavy Trucks:	61.3	59.9	50.8	52.1	60.4	60.5
Vehicle Noise:	67.8	66.0	62.9	58.2	66.8	67.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	27	58	124	267
CNEL:	29	62	133	287

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project | Project Name: Airport Gateway Specific P
Road Name: 6th Street | Job Number: 13635
Road Segment: Tippecanoe Avenue to Del Rosa Drive

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,491 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	449 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-4.90	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	77.72	-23.73	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-25.46	3.57	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	63.9	62.0	60.3	54.2	62.8	63.4
Medium Trucks:	56.4	54.9	48.5	46.9	55.4	55.6
Heavy Trucks:	59.9	58.5	49.5	50.7	59.1	59.2
Vehicle Noise:	65.9	64.2	60.9	56.3	64.9	65.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	14	29	63	136
CNEL:	15	31	68	146

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project | Project Name: Airport Gateway Specific P
Road Name: 6th Street | Job Number: 13635
Road Segment: Sterling Avenue to Victoria Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,051 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,005 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-1.40	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	77.72	-20.23	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-21.96	3.57	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.4	65.5	63.8	57.7	66.3	66.9
Medium Trucks:	59.9	58.4	52.0	50.4	58.9	59.1
Heavy Trucks:	63.4	62.0	52.9	54.2	62.6	62.7
Vehicle Noise:	69.4	67.7	64.4	59.8	68.4	68.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	23	50	108	234
CNEL:	25	54	116	250

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project | Project Name: Airport Gateway Specific P
Road Name: 6th Street | Job Number: 13635
Road Segment: Del Rosa Drive to Sterling Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,674 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	767 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-2.57	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	77.72	-21.40	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-23.13	3.57	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.2	64.4	62.6	56.5	65.2	65.8
Medium Trucks:	58.7	57.2	50.8	49.3	57.7	58.0
Heavy Trucks:	62.2	60.8	51.8	53.0	61.4	61.5
Vehicle Noise:	68.2	66.5	63.2	58.7	67.2	67.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	42	91	195
CNEL:	21	45	97	209

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project | Project Name: Airport Gateway Specific P
Road Name: 6th Street | Job Number: 13635
Road Segment: Victoria Avenue to Central Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,918 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,092 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-1.04	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	77.72	-19.87	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-21.60	3.57	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.8	65.9	64.1	58.1	66.7	67.3
Medium Trucks:	60.2	58.7	52.4	50.8	59.3	59.5
Heavy Trucks:	63.8	62.3	53.3	54.6	62.9	63.0
Vehicle Noise:	69.7	68.0	64.7	60.2	68.7	69.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	25	53	115	247
CNEL:	26	57	123	264

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project
Road Name: 5th Street
Road Segment: I-215 NB Ramps to E Street

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	43,371	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	4,337	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	27	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	4.44	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-14.39	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-16.12	0.13	-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
Autos:	71.8	69.9	68.1	62.1	70.7	71.3
Medium Trucks:	64.0	62.5	56.1	54.6	63.0	63.3
Heavy Trucks:	67.1	65.6	56.6	57.9	66.2	66.3
Vehicle Noise:	73.6	71.8	68.7	64.0	72.5	73.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	74	159	343	739
CNEL:	79	171	368	793

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project
Road Name: 5th Street
Road Segment: Waterman Avenue to Tippecanoe Avenue

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	22,329	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	2,233	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	14	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	33.0	feet
Centerline Dist. to Observer:	33.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	32.634
Medium Trucks:	32.362
Heavy Trucks:	32.389

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.56	2.68	-1.20	-4.52	0.000	0.000
Medium Trucks:	79.45	-17.28	2.73	-1.20	-4.86	0.000	0.000
Heavy Trucks:	84.25	-19.00	2.73	-1.20	-5.69	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.5	69.6	67.8	61.8	70.4	71.0
Medium Trucks:	63.7	62.2	55.8	54.3	62.7	63.0
Heavy Trucks:	66.8	65.4	56.3	57.6	65.9	66.0
Vehicle Noise:	73.3	71.5	68.4	63.7	72.2	72.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	47	100	216	465
CNEL:	50	108	232	499

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project
Road Name: 5th Street
Road Segment: E Street to Waterman Avenue

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	32,479	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	3,248	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	27	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.18	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-15.65	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-17.38	0.13	-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
Autos:	70.6	68.7	66.9	60.8	69.5	70.1
Medium Trucks:	62.7	61.2	54.9	53.3	61.8	62.0
Heavy Trucks:	65.8	64.4	55.3	56.6	65.0	65.1
Vehicle Noise:	72.3	70.6	67.4	62.7	71.3	71.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	61	131	283	609
CNEL:	65	141	303	654

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project
Road Name: 5th Street
Road Segment: Tippecanoe Avenue to Del Rosa Drive

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,858	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	2,386	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	14	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	33.0	feet
Centerline Dist. to Observer:	33.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	32.634
Medium Trucks:	32.362
Heavy Trucks:	32.389

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.84	2.68	-1.20	-4.52	0.000	0.000
Medium Trucks:	79.45	-16.99	2.73	-1.20	-4.86	0.000	0.000
Heavy Trucks:	84.25	-18.72	2.73	-1.20	-5.69	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	71.8	69.9	68.1	62.1	70.7	71.3
Medium Trucks:	64.0	62.5	56.1	54.6	63.0	63.3
Heavy Trucks:	67.1	65.6	56.6	57.9	66.2	66.3
Vehicle Noise:	73.6	71.8	68.7	64.0	72.5	73.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	49	105	226	486
CNEL:	52	112	242	522

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project
Road Name: 5th Street
Road Segment: Del Rosa Drive to Sterling Avenue

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,122 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,612 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.24	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.60	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-18.32	0.13	-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
Autos:	69.6	67.7	65.9	59.9	68.5	69.1
Medium Trucks:	61.8	60.3	53.9	52.4	60.8	61.1
Heavy Trucks:	64.9	63.4	54.4	55.7	64.0	64.1
Vehicle Noise:	71.4	69.6	66.5	61.8	70.3	70.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	53	114	245	527
CNEL:	57	122	262	565

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project
Road Name: 5th Street
Road Segment: Victoria Avenue to Central Avenue

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	32,258 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,226 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.15	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-15.68	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-17.41	0.13	-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
Autos:	70.5	68.6	66.9	60.8	69.4	70.0
Medium Trucks:	62.7	61.2	54.8	53.3	61.7	62.0
Heavy Trucks:	65.8	64.4	55.3	56.6	64.9	65.1
Vehicle Noise:	72.3	70.5	67.4	62.7	71.3	71.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	61	131	282	607
CNEL:	65	140	302	651

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project
Road Name: 5th Street
Road Segment: Sterling Avenue to Victoria Avenue

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,904 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,590 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	33.0 feet
Centerline Dist. to Observer:	33.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	32.634
Medium Trucks:	32.362
Heavy Trucks:	32.389

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.20	2.68	-1.20	-4.52	0.000	0.000
Medium Trucks:	79.45	-16.63	2.73	-1.20	-4.86	0.000	0.000
Heavy Trucks:	84.25	-18.36	2.73	-1.20	-5.69	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	72.1	70.2	68.5	62.4	71.0	71.6
Medium Trucks:	64.3	62.8	56.5	54.9	63.4	63.6
Heavy Trucks:	67.4	66.0	57.0	58.2	66.6	66.7
Vehicle Noise:	73.9	72.2	69.0	64.3	72.9	73.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	51	111	239	514
CNEL:	55	119	256	551

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project
Road Name: 5th Street
Road Segment: Central Avenue to Palm Avenue

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	35,031 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,503 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.51	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-15.32	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-17.05	0.13	-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
Autos:	70.9	69.0	67.2	61.2	69.8	70.4
Medium Trucks:	63.1	61.6	55.2	53.6	62.1	62.3
Heavy Trucks:	66.1	64.7	55.7	56.9	65.3	65.4
Vehicle Noise:	72.6	70.9	67.8	63.1	71.6	72.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	64	138	298	641
CNEL:	69	148	319	688

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project | Project Name: Airport Gateway Specific P
Road Name: 5th Street | Job Number: 13635
Road Segment: Palm Avenue to SR-210 EB Ramps

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	52,097 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	5,210 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	5.24	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-13.60	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-15.32	0.13	-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
Autos:	72.6	70.7	68.9	62.9	71.5	72.1
Medium Trucks:	64.8	63.3	56.9	55.4	63.8	64.1
Heavy Trucks:	67.9	66.4	57.4	58.7	67.0	67.1
Vehicle Noise:	74.4	72.6	69.5	64.8	73.3	73.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	84	180	388	835
CNEL:	90	193	416	896

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project | Project Name: Airport Gateway Specific P
Road Name: 3rd Street | Job Number: 13635
Road Segment: Tippecanoe Avenue to Del Rosa Drive

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,119 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,712 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.40	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.43	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-18.16	0.13	-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
Autos:	69.8	67.9	66.1	60.1	68.7	69.3
Medium Trucks:	61.9	60.4	54.1	52.5	61.0	61.2
Heavy Trucks:	65.0	63.6	54.6	55.8	64.2	64.3
Vehicle Noise:	71.5	69.8	66.6	62.0	70.5	71.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	54	116	251	540
CNEL:	58	125	269	580

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project | Project Name: Airport Gateway Specific P
Road Name: 3rd Street | Job Number: 13635
Road Segment: Waterman Avenue to Tippecanoe Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,686 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,169 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.25	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-20.09	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.82	0.13	-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
Autos:	66.1	64.2	62.4	56.4	65.0	65.6
Medium Trucks:	58.3	56.8	50.4	48.9	57.3	57.6
Heavy Trucks:	61.4	59.9	50.9	52.2	60.5	60.6
Vehicle Noise:	67.9	66.1	63.0	58.3	66.9	67.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	31	66	143	308
CNEL:	33	71	154	331

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project | Project Name: Airport Gateway Specific P
Road Name: 3rd Street | Job Number: 13635
Road Segment: Del Rosa Drive to Sterling Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,583 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,858 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.63	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.20	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-17.93	0.13	-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
Autos:	70.0	68.1	66.3	60.3	68.9	69.5
Medium Trucks:	62.2	60.7	54.3	52.8	61.2	61.5
Heavy Trucks:	65.3	63.8	54.8	56.0	64.4	64.5
Vehicle Noise:	71.8	70.0	66.9	62.2	70.7	71.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	56	121	260	560
CNEL:	60	129	279	600

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project
Road Name: 3rd Street
Road Segment: Sterling Avenue to Victoria Avenue

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,662	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,966	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	27	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.00	0.11	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-17.83	0.13	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-19.56	0.13	-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*
Autos:	68.4	66.5	64.7	58.7	67.3	67.9
Medium Trucks:	60.6	59.0	52.7	51.1	59.6	59.8
Heavy Trucks:	63.6	62.2	53.2	54.4	62.8	62.9
Vehicle Noise:	70.1	68.4	65.3	60.6	69.1	69.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	44	94	202	436
CNEL:	47	101	217	468

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040
Road Name: Waterman Avenue
Road Segment: Baseline Street to 5th Street

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,982	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	2,898	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	27	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	3.20	0.11	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-15.63	0.13	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-17.36	0.13	-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*
Autos:	68.6	66.7	65.0	58.9	67.5	68.1
Medium Trucks:	61.0	59.5	53.1	51.6	60.1	60.3
Heavy Trucks:	64.6	63.1	54.1	55.4	63.7	63.8
Vehicle Noise:	70.6	68.8	65.6	61.0	69.6	70.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	47	101	217	467
CNEL:	50	108	232	500

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E+Project
Road Name: 3rd Street
Road Segment: Victoria Avenue to Palm Avenue

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,123	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,712	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	27	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.40	0.11	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-18.43	0.13	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-20.16	0.13	-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*
Autos:	67.8	65.9	64.1	58.1	66.7	67.3
Medium Trucks:	60.0	58.4	52.1	50.5	59.0	59.2
Heavy Trucks:	63.0	61.6	52.6	53.8	62.2	62.3
Vehicle Noise:	69.5	67.8	64.6	60.0	68.5	69.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	40	86	185	398
CNEL:	43	92	198	427

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040
Road Name: Waterman Avenue
Road Segment: 5th Street to 3rd Street

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,551	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	3,155	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	67	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	37.453
Medium Trucks:	37.216
Heavy Trucks:	37.240

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	3.57	1.78	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	77.72	-15.26	1.82	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-16.99	1.82	-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*
Autos:	70.7	68.8	67.0	60.9	69.6	70.2
Medium Trucks:	63.1	61.6	55.2	53.7	62.1	62.4
Heavy Trucks:	66.6	65.2	56.2	57.4	65.8	65.9
Vehicle Noise:	72.6	70.9	67.6	63.1	71.6	72.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	64	138	297	639
CNEL:	68	147	317	684

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: Tippecanoe Avenue | Job Number: 13635
Road Segment: Baseline Street to 6th Street

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,291 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,929 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	42.626
Medium Trucks:	42.418
Heavy Trucks:	42.439

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.92	0.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-17.91	0.97	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.64	0.96	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.1	67.2	65.5	59.4	68.0	68.6
Medium Trucks:	61.3	59.8	53.4	51.9	60.4	60.6
Heavy Trucks:	64.4	63.0	53.9	55.2	63.5	63.7
Vehicle Noise:	70.9	69.1	66.0	61.3	69.9	70.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	43	93	200	430
CNEL:	46	99	214	462

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: Tippecanoe Avenue | Job Number: 13635
Road Segment: 3rd Street to Mill Street

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	43,928 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	4,393 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	67 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	37.453
Medium Trucks:	37.216
Heavy Trucks:	37.240

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	4.50	1.78	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-14.34	1.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-16.07	1.82	-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
Autos:	73.5	71.6	69.9	63.8	72.4	73.0
Medium Trucks:	65.7	64.2	57.9	56.3	64.8	65.0
Heavy Trucks:	68.8	67.4	58.3	59.6	68.0	68.1
Vehicle Noise:	75.3	73.6	70.4	65.7	74.3	74.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	96	208	447	964
CNEL:	103	223	480	1,034

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: Tippecanoe Avenue | Job Number: 13635
Road Segment: 6th Street to 3rd Street

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,328 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,633 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	42.626
Medium Trucks:	42.418
Heavy Trucks:	42.439

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.20	0.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-18.64	0.97	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.36	0.96	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.4	66.5	64.7	58.7	67.3	67.9
Medium Trucks:	60.6	59.1	52.7	51.2	59.6	59.9
Heavy Trucks:	63.7	62.2	53.2	54.4	62.8	62.9
Vehicle Noise:	70.2	68.4	65.3	60.6	69.1	69.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	39	83	179	385
CNEL:	41	89	192	413

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: Tippecanoe Avenue | Job Number: 13635
Road Segment: Mill Street to Orange Show Road /San Bernardino Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	47,921 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	4,792 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	4.87	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-13.96	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-15.69	0.13	-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
Autos:	72.2	70.3	68.6	62.5	71.1	71.8
Medium Trucks:	64.4	62.9	56.6	55.0	63.5	63.7
Heavy Trucks:	67.5	66.1	57.0	58.3	66.6	66.8
Vehicle Noise:	74.0	72.3	69.1	64.4	73.0	73.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	79	170	367	790
CNEL:	85	183	393	847

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: Tippecanoe Avenue | Job Number: 13635
Road Segment: Orange Show Road/ San Bernardino Avenue to Harriman Place / I-10 WB Ramps

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,159	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	2,916	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	67	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	37.453
Medium Trucks:	37.216
Heavy Trucks:	37.240

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.72	1.78	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.12	1.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-17.84	1.82	-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
Autos:	71.8	69.9	68.1	62.0	70.7	71.3
Medium Trucks:	64.0	62.4	56.1	54.5	63.0	63.2
Heavy Trucks:	67.0	65.6	56.6	57.8	66.2	66.3
Vehicle Noise:	73.5	71.8	68.6	64.0	72.5	73.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	73	158	341	734
CNEL:	79	170	365	787

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: Del Rosa Drive | Job Number: 13635
Road Segment: Highland Avenue to Pacific Street

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,585	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,959	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	14	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	33.0	feet
Centerline Dist. to Observer:	33.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	32.634
Medium Trucks:	32.362
Heavy Trucks:	32.389

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	2.08	2.68	-1.20	-4.52	0.000	0.000
Medium Trucks:	75.75	-16.75	2.73	-1.20	-4.86	0.000	0.000
Heavy Trucks:	81.57	-18.48	2.73	-1.20	-5.69	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.9	66.0	64.2	58.1	66.8	67.4
Medium Trucks:	60.5	59.0	52.7	51.1	59.6	59.8
Heavy Trucks:	64.6	63.2	54.2	55.4	63.8	63.9
Vehicle Noise:	70.1	68.3	64.9	60.5	69.0	69.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	28	61	132	285
CNEL:	30	66	141	304

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: Del Rosa Drive | Job Number: 13635
Road Segment: SR-210 EB Ramps to Highland Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,238	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	2,624	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	27	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.26	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.58	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-18.30	0.13	-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
Autos:	69.6	67.7	66.0	59.9	68.5	69.1
Medium Trucks:	61.8	60.3	53.9	52.4	60.9	61.1
Heavy Trucks:	64.9	63.5	54.4	55.7	64.0	64.2
Vehicle Noise:	71.4	69.6	66.5	61.8	70.4	70.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	53	114	245	529
CNEL:	57	122	263	567

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: Del Rosa Drive | Job Number: 13635
Road Segment: Pacific Street to Baseline Street

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,318	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,532	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	27	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.08	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-18.91	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.64	0.13	-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
Autos:	67.3	65.4	63.6	57.6	66.2	66.8
Medium Trucks:	59.5	58.0	51.6	50.1	58.5	58.7
Heavy Trucks:	62.5	61.1	52.1	53.3	61.7	61.8
Vehicle Noise:	69.1	67.3	64.2	59.5	68.0	68.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	37	80	171	369
CNEL:	40	85	184	396

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: Del Rosa Drive | Job Number: 13635
Road Segment: Baseline Street to 9th Street

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,139 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,214 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.09	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-19.92	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.65	0.13	-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
Autos:	66.3	64.4	62.6	56.6	65.2	65.8
Medium Trucks:	58.5	57.0	50.6	49.0	57.5	57.7
Heavy Trucks:	61.5	60.1	51.1	52.3	60.7	60.8
Vehicle Noise:	68.0	66.3	63.2	58.5	67.0	67.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	32	68	147	316
CNEL:	34	73	157	339

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: Del Rosa Drive | Job Number: 13635
Road Segment: 6th Street to 3rd Street

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,774 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,277 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.87	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-19.70	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.43	0.13	-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
Autos:	66.5	64.6	62.8	56.8	65.4	66.0
Medium Trucks:	58.7	57.2	50.8	49.3	57.7	58.0
Heavy Trucks:	61.8	60.3	51.3	52.5	60.9	61.0
Vehicle Noise:	68.3	66.5	63.4	58.7	67.2	67.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	33	70	152	327
CNEL:	35	76	163	351

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: Del Rosa Drive | Job Number: 13635
Road Segment: 9th Street to 6th Street

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,294 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,229 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.03	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-19.87	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.60	0.13	-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
Autos:	66.3	64.4	62.7	56.6	65.2	65.8
Medium Trucks:	58.5	57.0	50.6	49.1	57.6	57.8
Heavy Trucks:	61.6	60.2	51.1	52.4	60.7	60.9
Vehicle Noise:	68.1	66.4	63.2	58.5	67.1	67.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	32	69	148	319
CNEL:	34	74	159	342

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: Sterling Avenue | Job Number: 13635
Road Segment: Base Line to 9th Street

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,433 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,343 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-0.14	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-18.97	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-20.70	0.13	-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
Autos:	65.3	63.4	61.6	55.6	64.2	64.8
Medium Trucks:	57.7	56.2	49.8	48.3	56.7	57.0
Heavy Trucks:	61.2	59.8	50.8	52.0	60.4	60.5
Vehicle Noise:	67.2	65.5	62.2	57.7	66.2	66.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	28	60	130	280
CNEL:	30	64	139	299

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: Sterling Avenue | Job Number: 13635
Road Segment: 9th Street to 6th Street

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,385 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,439 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	0.16	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-18.67	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-20.40	0.13	-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
Autos:	65.6	63.7	61.9	55.9	64.5	65.1
Medium Trucks:	58.0	56.5	50.1	48.6	57.0	57.3
Heavy Trucks:	61.5	60.1	51.1	52.3	60.7	60.8
Vehicle Noise:	67.5	65.8	62.5	58.0	66.5	67.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	29	63	136	293
CNEL:	31	67	145	313

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: Victoria Avenue | Job Number: 13635
Road Segment: Highland Avenue to Pacific Street

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,114 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,611 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	42.626
Medium Trucks:	42.418
Heavy Trucks:	42.439

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	2.75	0.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-16.09	0.97	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-17.81	0.96	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.0	67.1	65.3	59.3	67.9	68.5
Medium Trucks:	61.4	59.9	53.5	52.0	60.4	60.7
Heavy Trucks:	64.9	63.5	54.5	55.7	64.1	64.2
Vehicle Noise:	70.9	69.2	65.9	61.4	69.9	70.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	44	94	202	435
CNEL:	47	100	216	466

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: Sterling Avenue | Job Number: 13635
Road Segment: 6th Street to 3rd Street

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,619 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,162 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-0.77	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-19.60	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-21.33	0.13	-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
Autos:	64.7	62.8	61.0	54.9	63.6	64.2
Medium Trucks:	57.0	55.5	49.2	47.6	56.1	56.3
Heavy Trucks:	60.6	59.2	50.1	51.4	59.7	59.9
Vehicle Noise:	66.6	64.9	61.6	57.0	65.6	66.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	25	55	118	254
CNEL:	27	59	126	272

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: Victoria Avenue | Job Number: 13635
Road Segment: Pacific Street to Base Line

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,643 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,764 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	42.626
Medium Trucks:	42.418
Heavy Trucks:	42.439

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	1.05	0.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-17.79	0.97	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-19.52	0.96	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.3	65.4	63.6	57.6	66.2	66.8
Medium Trucks:	59.7	58.2	51.8	50.3	58.7	59.0
Heavy Trucks:	63.2	61.8	52.8	54.0	62.4	62.5
Vehicle Noise:	69.2	67.5	64.2	59.7	68.2	68.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	34	72	156	335
CNEL:	36	77	167	359

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: Victoria Avenue | Job Number: 13635
Road Segment: Base Line to 9th Street

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,063 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,306 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	42.626
Medium Trucks:	42.418
Heavy Trucks:	42.439

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.77	0.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.60	0.97	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.33	0.96	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.4	65.5	63.8	57.7	66.3	66.9
Medium Trucks:	59.6	58.1	51.7	50.2	58.7	58.9
Heavy Trucks:	62.7	61.3	52.2	53.5	61.8	62.0
Vehicle Noise:	69.2	67.4	64.3	59.6	68.2	68.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	33	72	154	332
CNEL:	36	77	165	356

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: Victoria Avenue | Job Number: 13635
Road Segment: 6th Street to 3rd Street

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,525 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,253 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	42.626
Medium Trucks:	42.418
Heavy Trucks:	42.439

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.95	0.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.79	0.97	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.51	0.96	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.2	65.3	63.6	57.5	66.1	66.8
Medium Trucks:	59.4	57.9	51.6	50.0	58.5	58.7
Heavy Trucks:	62.5	61.1	52.0	53.3	61.6	61.8
Vehicle Noise:	69.0	67.3	64.1	59.4	68.0	68.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	32	70	150	323
CNEL:	35	75	161	346

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: Victoria Avenue | Job Number: 13635
Road Segment: 9th Street to 6th Street

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,302 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,030 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	42.626
Medium Trucks:	42.418
Heavy Trucks:	42.439

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.80	0.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-20.64	0.97	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-22.36	0.96	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.4	64.5	62.7	56.7	65.3	65.9
Medium Trucks:	58.6	57.1	50.7	49.2	57.6	57.9
Heavy Trucks:	61.7	60.2	51.2	52.4	60.8	60.9
Vehicle Noise:	68.2	66.4	63.3	58.6	67.1	67.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	28	61	132	283
CNEL:	30	65	141	304

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: 6th Street | Job Number: 13635
Road Segment: Tippecanoe Avenue to Del Rosa Drive

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,359 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	536 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-4.13	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	77.72	-22.96	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-24.69	3.57	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	64.7	62.8	61.0	55.0	63.6	64.2
Medium Trucks:	57.1	55.6	49.3	47.7	56.2	56.4
Heavy Trucks:	60.7	59.3	50.2	51.5	59.8	59.9
Vehicle Noise:	66.7	64.9	61.6	57.1	65.6	66.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	15	33	71	154
CNEL:	16	35	76	164

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: 6th Street | Job Number: 13635
Road Segment: Del Rosa Drive to Sterling Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,501 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	750 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-2.67	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	77.72	-21.50	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-23.23	3.57	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.2	64.3	62.5	56.4	65.1	65.7
Medium Trucks:	58.6	57.1	50.7	49.2	57.6	57.9
Heavy Trucks:	62.1	60.7	51.7	52.9	61.3	61.4
Vehicle Noise:	68.1	66.4	63.1	58.6	67.1	67.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	19	41	89	192
CNEL:	21	44	95	206

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: 6th Street | Job Number: 13635
Road Segment: Victoria Avenue to Central Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,844 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	584 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-3.75	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	77.72	-22.59	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-24.31	3.57	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.1	63.2	61.4	55.3	64.0	64.6
Medium Trucks:	57.5	56.0	49.6	48.1	56.6	56.8
Heavy Trucks:	61.1	59.6	50.6	51.8	60.2	60.3
Vehicle Noise:	67.0	65.3	62.0	57.5	66.0	66.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	16	35	76	163
CNEL:	17	38	81	174

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: 6th Street | Job Number: 13635
Road Segment: Sterling Avenue to Victoria Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,278 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	828 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-2.24	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	77.72	-21.07	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-22.80	3.57	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.6	64.7	62.9	56.9	65.5	66.1
Medium Trucks:	59.0	57.5	51.1	49.6	58.1	58.3
Heavy Trucks:	62.6	61.1	52.1	53.4	61.7	61.8
Vehicle Noise:	68.5	66.8	63.5	59.0	67.5	68.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	21	44	95	205
CNEL:	22	47	102	220

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: 5th Street | Job Number: 13635
Road Segment: I-215 NB Ramps to E Street

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	37,481 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,748 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.81	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-15.03	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-16.75	0.13	-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
Autos:	71.2	69.3	67.5	61.5	70.1	70.7
Medium Trucks:	63.4	61.8	55.5	53.9	62.4	62.6
Heavy Trucks:	66.4	65.0	56.0	57.2	65.6	65.7
Vehicle Noise:	72.9	71.2	68.1	63.4	71.9	72.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	67	144	311	671
CNEL:	72	155	334	719

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: 5th Street | Job Number: 13635
Road Segment: E Street to Waterman Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	22,657 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,266 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.62	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-17.21	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-18.94	0.13	-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
Autos:	69.0	67.1	65.3	59.3	67.9	68.5
Medium Trucks:	61.2	59.7	53.3	51.8	60.2	60.4
Heavy Trucks:	64.2	62.8	53.8	55.0	63.4	63.5
Vehicle Noise:	70.8	69.0	65.9	61.2	69.7	70.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	48	103	223	479
CNEL:	51	111	239	514

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: 5th Street | Job Number: 13635
Road Segment: Tippecanoe Avenue to Del Rosa Drive

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,297 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,430 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	33.0 feet
Centerline Dist. to Observer:	33.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	32.634
Medium Trucks:	32.362
Heavy Trucks:	32.389

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.38	2.68	-1.20	-4.52	0.000	0.000
Medium Trucks:	79.45	-19.21	2.73	-1.20	-4.86	0.000	0.000
Heavy Trucks:	84.25	-20.94	2.73	-1.20	-5.69	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.6	67.7	65.9	59.8	68.5	69.1
Medium Trucks:	61.8	60.3	53.9	52.4	60.8	61.0
Heavy Trucks:	64.8	63.4	54.4	55.6	64.0	64.1
Vehicle Noise:	71.3	69.6	66.4	61.8	70.3	70.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	35	74	160	346
CNEL:	37	80	172	371

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: 5th Street | Job Number: 13635
Road Segment: Waterman Avenue to Tippecanoe Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,621 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,362 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	33.0 feet
Centerline Dist. to Observer:	33.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	32.634
Medium Trucks:	32.362
Heavy Trucks:	32.389

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.59	2.68	-1.20	-4.52	0.000	0.000
Medium Trucks:	79.45	-19.42	2.73	-1.20	-4.86	0.000	0.000
Heavy Trucks:	84.25	-21.15	2.73	-1.20	-5.69	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.3	67.4	65.7	59.6	68.2	68.9
Medium Trucks:	61.6	60.0	53.7	52.1	60.6	60.8
Heavy Trucks:	64.6	63.2	54.2	55.4	63.8	63.9
Vehicle Noise:	71.1	69.4	66.2	61.6	70.1	70.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	33	72	155	335
CNEL:	36	77	167	359

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: 5th Street | Job Number: 13635
Road Segment: Del Rosa Drive to Sterling Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,664 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,066 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.65	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-20.49	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-22.21	0.13	-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
Autos:	65.7	63.8	62.1	56.0	64.6	65.2
Medium Trucks:	57.9	56.4	50.0	48.5	56.9	57.2
Heavy Trucks:	61.0	59.5	50.5	51.8	60.1	60.2
Vehicle Noise:	67.5	65.7	62.6	57.9	66.5	66.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	29	62	135	290
CNEL:	31	67	144	311

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: 5th Street | Job Number: 13635
Road Segment: Sterling Avenue to Victoria Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,476	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	848	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	14	feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	33.0 feet
Centerline Dist. to Observer:	33.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	32.634
Medium Trucks:	32.362
Heavy Trucks:	32.389

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-2.65	2.68	-1.20	*-4.52*	0.000	0.000
Medium Trucks:	79.45	-21.48	2.73	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	84.25	-23.21	2.73	-1.20	*-5.69*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.3	65.4	63.6	57.6	66.2	66.8
Medium Trucks:	59.5	58.0	51.6	50.1	58.5	58.8
Heavy Trucks:	62.6	61.1	52.1	53.4	61.7	61.8
Vehicle Noise:	69.1	67.3	64.2	59.5	68.0	68.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	24	53	113	244
CNEL:	26	56	121	262

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: 5th Street | Job Number: 13635
Road Segment: Central Avenue to Palm Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,912	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,191	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	27	feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.17	0.11	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-20.01	0.13	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-21.73	0.13	-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
Autos:	66.2	64.3	62.5	56.5	65.1	65.7
Medium Trucks:	58.4	56.9	50.5	49.0	57.4	57.7
Heavy Trucks:	61.5	60.0	51.0	52.2	60.6	60.7
Vehicle Noise:	68.0	66.2	63.1	58.4	66.9	67.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	31	67	145	312
CNEL:	34	72	155	335

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: 5th Street | Job Number: 13635
Road Segment: Victoria Avenue to Central Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,954	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,195	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	27	feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.16	0.11	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-19.99	0.13	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-21.72	0.13	-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
Autos:	66.2	64.3	62.5	56.5	65.1	65.7
Medium Trucks:	58.4	56.9	50.5	49.0	57.4	57.7
Heavy Trucks:	61.5	60.0	51.0	52.3	60.6	60.7
Vehicle Noise:	68.0	66.2	63.1	58.4	66.9	67.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	31	67	145	313
CNEL:	34	72	156	336

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: 5th Street | Job Number: 13635
Road Segment: Palm Avenue to SR-210 EB Ramps

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	33,870	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	3,387	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	27	feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.37	0.11	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-15.47	0.13	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-17.19	0.13	-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
Autos:	70.7	68.8	67.1	61.0	69.6	70.2
Medium Trucks:	62.9	61.4	55.0	53.5	62.0	62.2
Heavy Trucks:	66.0	64.6	55.5	56.8	65.1	65.3
Vehicle Noise:	72.5	70.8	67.6	62.9	71.5	71.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	63	135	291	627
CNEL:	67	145	312	672

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: 3rd Street | Job Number: 13635
Road Segment: Waterman Avenue to Tippecanoe Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,621 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,362 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.59	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-19.42	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.15	0.13	-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
Autos:	66.8	64.9	63.1	57.1	65.7	66.3
Medium Trucks:	59.0	57.5	51.1	49.5	58.0	58.2
Heavy Trucks:	62.0	60.6	51.6	52.8	61.2	61.3
Vehicle Noise:	68.5	66.8	63.7	59.0	67.5	68.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	34	74	158	341
CNEL:	37	79	170	366

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: 3rd Street | Job Number: 13635
Road Segment: Del Rosa Drive to Sterling Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	34,523 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,452 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.45	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-15.38	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-17.11	0.13	-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
Autos:	70.8	68.9	67.2	61.1	69.7	70.3
Medium Trucks:	63.0	61.5	55.1	53.6	62.0	62.3
Heavy Trucks:	66.1	64.6	55.6	56.9	65.2	65.3
Vehicle Noise:	72.6	70.8	67.7	63.0	71.6	72.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	63	137	295	635
CNEL:	68	147	316	681

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: 3rd Street | Job Number: 13635
Road Segment: Tippecanoe Avenue to Del Rosa Drive

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,594 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,959 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.99	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-17.84	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.57	0.13	-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
Autos:	68.4	66.5	64.7	58.6	67.3	67.9
Medium Trucks:	60.5	59.0	52.7	51.1	59.6	59.8
Heavy Trucks:	63.6	62.2	53.2	54.4	62.8	62.9
Vehicle Noise:	70.1	68.4	65.2	60.6	69.1	69.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	44	94	202	435
CNEL:	47	101	217	467

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: 3rd Street | Job Number: 13635
Road Segment: Sterling Avenue to Victoria Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,178 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,118 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.33	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-17.51	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.23	0.13	-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
Autos:	68.7	66.8	65.0	59.0	67.6	68.2
Medium Trucks:	60.9	59.4	53.0	51.5	59.9	60.2
Heavy Trucks:	63.9	62.5	53.5	54.7	63.1	63.2
Vehicle Noise:	70.5	68.7	65.6	60.9	69.4	69.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	46	99	213	458
CNEL:	49	106	228	492

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040 | Project Name: Airport Gateway Specific P
Road Name: 3rd Street | Job Number: 13635
Road Segment: Victoria Avenue to Palm Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,390 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,839 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.71	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-18.12	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.85	0.13	-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
Autos:	68.1	66.2	64.4	58.4	67.0	67.6
Medium Trucks:	60.3	58.8	52.4	50.8	59.3	59.5
Heavy Trucks:	63.3	61.9	52.9	54.1	62.5	62.6
Vehicle Noise:	69.8	68.1	65.0	60.3	68.8	69.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	42	90	194	417
CNEL:	45	96	208	447

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project | Project Name: Airport Gateway Specific P
Road Name: Waterman Avenue | Job Number: 13635
Road Segment: 5th Street to 3rd Street

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	32,255 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,226 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	67 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	37.453
Medium Trucks:	37.216
Heavy Trucks:	37.240

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	3.67	1.78	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-15.17	1.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-16.90	1.82	-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
Autos:	70.8	68.9	67.1	61.0	69.7	70.3
Medium Trucks:	63.2	61.7	55.3	53.8	62.2	62.4
Heavy Trucks:	66.7	65.3	56.3	57.5	65.9	66.0
Vehicle Noise:	72.7	71.0	67.7	63.2	71.7	72.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	65	140	301	648
CNEL:	69	150	322	694

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project | Project Name: Airport Gateway Specific P
Road Name: Waterman Avenue | Job Number: 13635
Road Segment: Baseline Street to 5th Street

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,303 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,930 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	3.25	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-15.58	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-17.31	0.13	-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
Autos:	68.7	66.8	65.0	58.9	67.6	68.2
Medium Trucks:	61.1	59.6	53.2	51.6	60.1	60.3
Heavy Trucks:	64.6	63.2	54.2	55.4	63.8	63.9
Vehicle Noise:	70.6	68.9	65.6	61.1	69.6	70.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	47	101	218	470
CNEL:	50	108	234	503

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project | Project Name: Airport Gateway Specific P
Road Name: Tippecanoe Avenue | Job Number: 13635
Road Segment: Baseline Street to 6th Street

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,437 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,044 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	42.626
Medium Trucks:	42.418
Heavy Trucks:	42.439

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.17	0.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-17.66	0.97	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.39	0.96	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.4	67.5	65.7	59.6	68.3	68.9
Medium Trucks:	61.6	60.0	53.7	52.1	60.6	60.8
Heavy Trucks:	64.6	63.2	54.2	55.4	63.8	63.9
Vehicle Noise:	71.1	69.4	66.2	61.6	70.1	70.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	45	96	208	447
CNEL:	48	103	223	480

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project | Project Name: Airport Gateway Specific P
Road Name: Tippecanoe Avenue | Job Number: 13635
Road Segment: 6th Street to 3rd Street

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,388 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,139 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	42.626
Medium Trucks:	42.418
Heavy Trucks:	42.439

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	1.37	0.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-17.46	0.97	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.19	0.96	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.6	67.7	65.9	59.8	68.5	69.1
Medium Trucks:	61.8	60.2	53.9	52.3	60.8	61.0
Heavy Trucks:	64.8	63.4	54.4	55.6	64.0	64.1
Vehicle Noise:	71.3	69.6	66.4	61.8	70.3	70.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	46	99	214	461
CNEL:	49	107	230	495

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project | Project Name: Airport Gateway Specific P
Road Name: Tippecanoe Avenue | Job Number: 13635
Road Segment: Mill Street to Orange Show Road /San Bernardino Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	57,683 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	5,768 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	5.68	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-13.15	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-14.88	0.13	-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
Autos:	73.0	71.1	69.4	63.3	72.0	72.6
Medium Trucks:	65.2	63.7	57.4	55.8	64.3	64.5
Heavy Trucks:	68.3	66.9	57.8	59.1	67.4	67.6
Vehicle Noise:	74.8	73.1	69.9	65.2	73.8	74.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	89	193	415	894
CNEL:	96	207	445	959

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project | Project Name: Airport Gateway Specific P
Road Name: Tippecanoe Avenue | Job Number: 13635
Road Segment: 3rd Street to Mill Street

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	53,690 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	5,369 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	67 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	37.453
Medium Trucks:	37.216
Heavy Trucks:	37.240

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	5.37	1.78	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-13.47	1.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-15.19	1.82	-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
Autos:	74.4	72.5	70.7	64.7	73.3	73.9
Medium Trucks:	66.6	65.1	58.7	57.2	65.6	65.9
Heavy Trucks:	69.7	68.3	59.2	60.5	68.8	68.9
Vehicle Noise:	76.2	74.4	71.3	66.6	75.1	75.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	110	237	512	1,102
CNEL:	118	255	549	1,182

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project | Project Name: Airport Gateway Specific P
Road Name: Tippecanoe Avenue | Job Number: 13635
Road Segment: Orange Show Road/ San Bernardino Avenue to Harriman Place / I-10 WB Ramps

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	38,921 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,892 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	67 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	37.453
Medium Trucks:	37.216
Heavy Trucks:	37.240

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.97	1.78	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-14.86	1.82	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-16.59	1.82	-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
Autos:	73.0	71.1	69.3	63.3	71.9	72.5
Medium Trucks:	65.2	63.7	57.3	55.8	64.3	64.5
Heavy Trucks:	68.3	66.9	57.8	59.1	67.4	67.6
Vehicle Noise:	74.8	73.0	69.9	65.2	73.8	74.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	89	192	413	889
CNEL:	95	206	443	954

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project
Road Name: Del Rosa Drive
Road Segment: SR-210 EB Ramps to Highland Avenue

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,538	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	2,854	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	27	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.62	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.21	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-17.94	0.13	-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
Autos:	70.0	68.1	66.3	60.3	68.9	69.5
Medium Trucks:	62.2	60.7	54.3	52.8	61.2	61.5
Heavy Trucks:	65.2	63.8	54.8	56.0	64.4	64.5
Vehicle Noise:	71.8	70.0	66.9	62.2	70.7	71.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	56	120	260	559
CNEL:	60	129	278	600

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project
Road Name: Del Rosa Drive
Road Segment: Pacific Street to Baseline Street

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,618	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,762	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	27	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.53	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-18.31	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.03	0.13	-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
Autos:	67.9	66.0	64.2	58.2	66.8	67.4
Medium Trucks:	60.1	58.6	52.2	50.7	59.1	59.4
Heavy Trucks:	63.2	61.7	52.7	53.9	62.3	62.4
Vehicle Noise:	69.7	67.9	64.8	60.1	68.6	69.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	41	87	188	405
CNEL:	43	94	202	435

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project
Road Name: Del Rosa Drive
Road Segment: Highland Avenue to Pacific Street

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,885	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	2,189	vehicles
Vehicle Speed:	35	mph
Near/Far Lane Distance:	14	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	33.0	feet
Centerline Dist. to Observer:	33.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	32.634
Medium Trucks:	32.362
Heavy Trucks:	32.389

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	2.56	2.68	-1.20	-4.52	0.000	0.000
Medium Trucks:	75.75	-16.27	2.73	-1.20	-4.86	0.000	0.000
Heavy Trucks:	81.57	-18.00	2.73	-1.20	-5.69	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.3	66.4	64.7	58.6	67.2	67.8
Medium Trucks:	61.0	59.5	53.1	51.6	60.1	60.3
Heavy Trucks:	65.1	63.7	54.6	55.9	64.2	64.4
Vehicle Noise:	70.5	68.8	65.4	61.0	69.5	70.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	31	66	142	307
CNEL:	33	71	152	328

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project
Road Name: Del Rosa Drive
Road Segment: Baseline Street to 9th Street

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,647	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,865	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	27	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.77	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-18.06	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.79	0.13	-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
Autos:	68.1	66.2	64.5	58.4	67.0	67.7
Medium Trucks:	60.3	58.8	52.5	50.9	59.4	59.6
Heavy Trucks:	63.4	62.0	52.9	54.2	62.5	62.7
Vehicle Noise:	69.9	68.2	65.0	60.3	68.9	69.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	42	91	195	421
CNEL:	45	97	210	452

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project
Road Name: Del Rosa Drive
Road Segment: 9th Street to 6th Street
Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,802 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,880 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.81	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-18.02	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.75	0.13	-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
Autos:	68.2	66.3	64.5	58.5	67.1	67.7
Medium Trucks:	60.4	58.9	52.5	50.9	59.4	59.6
Heavy Trucks:	63.4	62.0	53.0	54.2	62.6	62.7
Vehicle Noise:	69.9	68.2	65.1	60.4	68.9	69.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	42	91	196	423
CNEL:	45	98	211	454

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project
Road Name: Sterling Avenue
Road Segment: Base Line to 9th Street
Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,871 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,687 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	0.85	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-17.98	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-19.71	0.13	-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
Autos:	66.3	64.4	62.6	56.6	65.2	65.8
Medium Trucks:	58.7	57.2	50.8	49.3	57.7	57.9
Heavy Trucks:	62.2	60.8	51.8	53.0	61.4	61.5
Vehicle Noise:	68.2	66.5	63.2	58.7	67.2	67.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	33	70	151	325
CNEL:	35	75	162	348

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project
Road Name: Del Rosa Drive
Road Segment: 6th Street to 3rd Street
Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,758 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,476 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.24	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-19.08	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.80	0.13	-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
Autos:	67.1	65.2	63.5	57.4	66.0	66.6
Medium Trucks:	59.3	57.8	51.4	49.9	58.4	58.6
Heavy Trucks:	62.4	61.0	51.9	53.2	61.5	61.7
Vehicle Noise:	68.9	67.1	64.0	59.3	67.9	68.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	36	78	167	360
CNEL:	39	83	179	386

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project
Road Name: Sterling Avenue
Road Segment: 9th Street to 6th Street
Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,551 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,655 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	0.77	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-18.07	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-19.79	0.13	-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
Autos:	66.2	64.3	62.5	56.5	65.1	65.7
Medium Trucks:	58.6	57.1	50.7	49.2	57.6	57.9
Heavy Trucks:	62.1	60.7	51.7	52.9	61.3	61.4
Vehicle Noise:	68.1	66.4	63.1	58.6	67.1	67.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	32	69	149	321
CNEL:	34	74	160	344

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project
Road Name: Sterling Avenue
Road Segment: 6th Street to 3rd Street
Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,001 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,900 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	1.37	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	77.72	-17.47	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-19.19	0.13	-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
Autos:	66.8	64.9	63.1	57.1	65.7	66.3
Medium Trucks:	59.2	57.7	51.3	49.8	58.2	58.5
Heavy Trucks:	62.7	61.3	52.3	53.5	61.9	62.0
Vehicle Noise:	68.7	67.0	63.7	59.2	67.7	68.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	35	76	164	352
CNEL:	38	81	175	377

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project
Road Name: Victoria Avenue
Road Segment: Pacific Street to Base Line
Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	22,899 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,290 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	42.626
Medium Trucks:	42.418
Heavy Trucks:	42.439

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	2.18	0.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-16.66	0.97	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-18.38	0.96	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.4	66.5	64.8	58.7	67.3	67.9
Medium Trucks:	60.8	59.3	53.0	51.4	59.9	60.1
Heavy Trucks:	64.4	63.0	53.9	55.2	63.5	63.6
Vehicle Noise:	70.4	68.6	65.4	60.8	69.4	69.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	40	86	185	399
CNEL:	43	92	198	427

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project
Road Name: Victoria Avenue
Road Segment: Highland Avenue to Pacific Street
Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,874 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,087 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	42.626
Medium Trucks:	42.418
Heavy Trucks:	42.439

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	3.48	0.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	77.72	-15.36	0.97	-1.20	-4.87	0.000	0.000
Heavy Trucks:	82.99	-17.09	0.96	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.7	67.8	66.1	60.0	68.6	69.2
Medium Trucks:	62.1	60.6	54.3	52.7	61.2	61.4
Heavy Trucks:	65.7	64.3	55.2	56.5	64.8	64.9
Vehicle Noise:	71.7	69.9	66.7	62.1	70.7	71.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	49	105	226	487
CNEL:	52	112	242	521

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project
Road Name: Victoria Avenue
Road Segment: Base Line to 9th Street
Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	18,319 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,832 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	24 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	44.0 feet
Centerline Dist. to Observer:	44.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	42.626
Medium Trucks:	42.418
Heavy Trucks:	42.439

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	0.70	0.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-18.14	0.97	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-19.86	0.96	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.9	67.0	65.2	59.2	67.8	68.4
Medium Trucks:	61.1	59.6	53.2	51.7	60.1	60.4
Heavy Trucks:	64.2	62.7	53.7	54.9	63.3	63.4
Vehicle Noise:	70.7	68.9	65.8	61.1	69.6	70.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	42	90	193	416
CNEL:	45	96	207	446

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project
Road Name: Victoria Avenue
Road Segment: 9th Street to 6th Street

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,558	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,556	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	24	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	44.0	feet
Centerline Dist. to Observer:	44.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	42.626
Medium Trucks:	42.418
Heavy Trucks:	42.439

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.01	0.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-18.85	0.97	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.57	0.96	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.2	66.3	64.5	58.5	67.1	67.7
Medium Trucks:	60.4	58.9	52.5	51.0	59.4	59.7
Heavy Trucks:	63.4	62.0	53.0	54.2	62.6	62.7
Vehicle Noise:	69.9	68.2	65.1	60.4	68.9	69.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	37	80	173	373
CNEL:	40	86	186	400

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project
Road Name: 6th Street
Road Segment: Tippecanoe Avenue to Del Rosa Drive

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,601	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	660	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-3.22	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	77.72	-22.06	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-23.78	3.57	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	65.6	63.7	61.9	55.9	64.5	65.1
Medium Trucks:	58.0	56.5	50.2	48.6	57.1	57.3
Heavy Trucks:	61.6	60.2	51.1	52.4	60.7	60.9
Vehicle Noise:	67.6	65.8	62.5	58.0	66.5	67.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	18	38	82	176
CNEL:	19	41	88	189

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project
Road Name: Victoria Avenue
Road Segment: 6th Street to 3rd Street

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,593	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,359	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	24	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	44.0	feet
Centerline Dist. to Observer:	44.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	42.626
Medium Trucks:	42.418
Heavy Trucks:	42.439

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.60	0.94	-1.20	-4.61	0.000	0.000
Medium Trucks:	79.45	-19.43	0.97	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-21.16	0.96	-1.20	-5.50	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.6	65.7	63.9	57.9	66.5	67.1
Medium Trucks:	59.8	58.3	51.9	50.4	58.8	59.1
Heavy Trucks:	62.9	61.4	52.4	53.6	62.0	62.1
Vehicle Noise:	69.4	67.6	64.5	59.8	68.3	68.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	34	73	158	341
CNEL:	37	79	170	366

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project
Road Name: 6th Street
Road Segment: Del Rosa Drive to Sterling Avenue

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,461	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	1,046	vehicles
Vehicle Speed:	40	mph
Near/Far Lane Distance:	20	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	30.0	feet
Centerline Dist. to Observer:	30.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-1.22	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	77.72	-20.06	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-21.79	3.57	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.6	65.7	63.9	57.9	66.5	67.1
Medium Trucks:	60.0	58.5	52.2	50.6	59.1	59.3
Heavy Trucks:	63.6	62.2	53.1	54.4	62.7	62.9
Vehicle Noise:	69.6	67.8	64.5	60.0	68.5	69.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	24	52	111	240
CNEL:	26	55	119	257

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project | Project Name: Airport Gateway Specific P
Road Name: 6th Street | Job Number: 13635
Road Segment: Sterling Avenue to Victoria Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,810 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,481 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	0.29	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	77.72	-18.55	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-20.28	3.57	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	69.1	67.2	65.4	59.4	68.0	68.6
Medium Trucks:	61.5	60.0	53.7	52.1	60.6	60.8
Heavy Trucks:	65.1	63.7	54.6	55.9	64.2	64.4
Vehicle Noise:	71.1	69.3	66.0	61.5	70.1	70.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	30	65	140	302
CNEL:	32	70	150	324

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project | Project Name: Airport Gateway Specific P
Road Name: 5th Street | Job Number: 13635
Road Segment: I-215 NB Ramps to E Street

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	49,877 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	4,988 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	5.05	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-13.79	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-15.51	0.13	-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
Autos:	72.4	70.5	68.8	62.7	71.3	71.9
Medium Trucks:	64.6	63.1	56.7	55.2	63.6	63.9
Heavy Trucks:	67.7	66.2	57.2	58.5	66.8	66.9
Vehicle Noise:	74.2	72.4	69.3	64.6	73.2	73.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	81	175	377	811
CNEL:	87	187	404	870

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project | Project Name: Airport Gateway Specific P
Road Name: 6th Street | Job Number: 13635
Road Segment: Victoria Avenue to Central Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,715 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,272 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	20 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	30.0 feet
Centerline Dist. to Observer:	30.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	28.723
Medium Trucks:	28.413
Heavy Trucks:	28.444

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	-0.38	3.51	-1.20	-4.49	0.000	0.000
Medium Trucks:	77.72	-19.21	3.58	-1.20	-4.86	0.000	0.000
Heavy Trucks:	82.99	-20.94	3.57	-1.20	-5.77	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.4	66.5	64.8	58.7	67.3	68.0
Medium Trucks:	60.9	59.4	53.0	51.5	59.9	60.2
Heavy Trucks:	64.4	63.0	54.0	55.2	63.6	63.7
Vehicle Noise:	70.4	68.7	65.4	60.9	69.4	69.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	27	59	127	273
CNEL:	29	63	136	292

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project | Project Name: Airport Gateway Specific P
Road Name: 5th Street | Job Number: 13635
Road Segment: E Street to Waterman Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	35,053 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,505 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.52	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-15.32	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-17.05	0.13	-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
Autos:	70.9	69.0	67.2	61.2	69.8	70.4
Medium Trucks:	63.1	61.6	55.2	53.6	62.1	62.3
Heavy Trucks:	66.1	64.7	55.7	56.9	65.3	65.4
Vehicle Noise:	72.6	70.9	67.8	63.1	71.6	72.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	64	138	298	641
CNEL:	69	148	319	688

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project | Project Name: Airport Gateway Specific P
Road Name: 5th Street | Job Number: 13635
Road Segment: Waterman Avenue to Tippecanoe Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,783 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,678 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	33.0 feet
Centerline Dist. to Observer:	33.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	32.634
Medium Trucks:	32.362
Heavy Trucks:	32.389

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.35	2.68	-1.20	-4.52	0.000	0.000
Medium Trucks:	79.45	-16.49	2.73	-1.20	-4.86	0.000	0.000
Heavy Trucks:	84.25	-18.21	2.73	-1.20	-5.69	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	72.3	70.4	68.6	62.6	71.2	71.8
Medium Trucks:	64.5	63.0	56.6	55.1	63.5	63.8
Heavy Trucks:	67.6	66.1	57.1	58.4	66.7	66.8
Vehicle Noise:	74.1	72.3	69.2	64.5	73.0	73.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	53	113	244	525
CNEL:	56	121	262	564

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project | Project Name: Airport Gateway Specific P
Road Name: 5th Street | Job Number: 13635
Road Segment: Del Rosa Drive to Sterling Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,191 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,119 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.01	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-15.83	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-17.55	0.13	-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
Autos:	70.4	68.5	66.7	60.7	69.3	69.9
Medium Trucks:	62.6	61.0	54.7	53.1	61.6	61.8
Heavy Trucks:	65.6	64.2	55.2	56.4	64.8	64.9
Vehicle Noise:	72.1	70.4	67.3	62.6	71.1	71.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	59	128	275	593
CNEL:	64	137	295	636

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project | Project Name: Airport Gateway Specific P
Road Name: 5th Street | Job Number: 13635
Road Segment: Tippecanoe Avenue to Del Rosa Drive

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,430 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,943 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	33.0 feet
Centerline Dist. to Observer:	33.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	32.634
Medium Trucks:	32.362
Heavy Trucks:	32.389

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.76	2.68	-1.20	-4.52	0.000	0.000
Medium Trucks:	79.45	-16.08	2.73	-1.20	-4.86	0.000	0.000
Heavy Trucks:	84.25	-17.80	2.73	-1.20	-5.69	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	72.7	70.8	69.0	63.0	71.6	72.2
Medium Trucks:	64.9	63.4	57.0	55.5	63.9	64.2
Heavy Trucks:	68.0	66.6	57.5	58.8	67.1	67.2
Vehicle Noise:	74.5	72.7	69.6	64.9	73.4	73.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	56	121	260	559
CNEL:	60	129	279	600

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project | Project Name: Airport Gateway Specific P
Road Name: 5th Street | Job Number: 13635
Road Segment: Sterling Avenue to Victoria Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,469 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,047 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	33.0 feet
Centerline Dist. to Observer:	33.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	32.634
Medium Trucks:	32.362
Heavy Trucks:	32.389

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.91	2.68	-1.20	-4.52	0.000	0.000
Medium Trucks:	79.45	-15.93	2.73	-1.20	-4.86	0.000	0.000
Heavy Trucks:	84.25	-17.65	2.73	-1.20	-5.69	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	72.8	70.9	69.2	63.1	71.7	72.4
Medium Trucks:	65.1	63.5	57.2	55.6	64.1	64.3
Heavy Trucks:	68.1	66.7	57.7	58.9	67.3	67.4
Vehicle Noise:	74.6	72.9	69.7	65.0	73.6	74.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	57	123	266	573
CNEL:	61	132	285	614

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project | Project Name: Airport Gateway Specific P
Road Name: 5th Street | Job Number: 13635
Road Segment: Victoria Avenue to Central Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	34,273 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,427 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.42	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-15.42	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-17.14	0.13	-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
Autos:	70.8	68.9	67.1	61.1	69.7	70.3
Medium Trucks:	63.0	61.5	55.1	53.6	62.0	62.2
Heavy Trucks:	66.0	64.6	55.6	56.8	65.2	65.3
Vehicle Noise:	72.5	70.8	67.7	63.0	71.5	72.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	63	136	293	632
CNEL:	68	146	315	678

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project | Project Name: Airport Gateway Specific P
Road Name: 5th Street | Job Number: 13635
Road Segment: Palm Avenue to SR-210 EB Ramps

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	59,869 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	5,987 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	5.84	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-12.99	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-14.72	0.13	-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
Autos:	73.2	71.3	69.5	63.5	72.1	72.7
Medium Trucks:	65.4	63.9	57.5	56.0	64.4	64.7
Heavy Trucks:	68.5	67.0	58.0	59.3	67.6	67.7
Vehicle Noise:	75.0	73.2	70.1	65.4	73.9	74.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	92	197	425	916
CNEL:	98	212	456	983

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project | Project Name: Airport Gateway Specific P
Road Name: 5th Street | Job Number: 13635
Road Segment: Central Avenue to Palm Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	37,004 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,700 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.75	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-15.08	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-16.81	0.13	-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
Autos:	71.1	69.2	67.5	61.4	70.0	70.6
Medium Trucks:	63.3	61.8	55.4	53.9	62.3	62.6
Heavy Trucks:	66.4	65.0	55.9	57.2	65.5	65.6
Vehicle Noise:	72.9	71.1	68.0	63.3	71.9	72.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	66	143	309	665
CNEL:	71	154	331	713

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project | Project Name: Airport Gateway Specific P
Road Name: 3rd Street | Job Number: 13635
Road Segment: Waterman Avenue to Tippecanoe Avenue

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,847 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,485 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	27 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-0.22	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-19.05	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-20.78	0.13	-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
Autos:	67.2	65.3	63.5	57.4	66.1	66.7
Medium Trucks:	59.3	57.8	51.5	49.9	58.4	58.6
Heavy Trucks:	62.4	61.0	51.9	53.2	61.6	61.7
Vehicle Noise:	68.9	67.2	64.0	59.3	67.9	68.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	36	78	168	362
CNEL:	39	84	180	388

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project
Road Name: 3rd Street
Road Segment: Tippecanoe Avenue to Del Rosa Drive

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,093	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	3,109	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	27	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	3.00	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-15.84	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-17.57	0.13	-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
Autos:	70.4	68.5	66.7	60.6	69.3	69.9
Medium Trucks:	62.5	61.0	54.7	53.1	61.6	61.8
Heavy Trucks:	65.6	64.2	55.2	56.4	64.8	64.9
Vehicle Noise:	72.1	70.4	67.2	62.6	71.1	71.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	59	128	275	592
CNEL:	64	137	295	635

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project
Road Name: 3rd Street
Road Segment: Sterling Avenue to Victoria Avenue

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,383	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	2,738	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	27	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.44	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.39	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-18.12	0.13	-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
Autos:	69.8	67.9	66.1	60.1	68.7	69.3
Medium Trucks:	62.0	60.5	54.1	52.6	61.0	61.3
Heavy Trucks:	65.1	63.6	54.6	55.9	64.2	64.3
Vehicle Noise:	71.6	69.8	66.7	62.0	70.5	71.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	54	117	252	544
CNEL:	58	126	271	584

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project
Road Name: 3rd Street
Road Segment: Del Rosa Drive to Sterling Avenue

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	44,963	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	4,496	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	27	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	4.60	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-14.24	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-15.96	0.13	-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
Autos:	72.0	70.1	68.3	62.2	70.9	71.5
Medium Trucks:	64.1	62.6	56.3	54.7	63.2	63.4
Heavy Trucks:	67.2	65.8	56.8	58.0	66.4	66.5
Vehicle Noise:	73.7	72.0	68.8	64.2	72.7	73.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	76	163	351	757
CNEL:	81	175	377	812

Thursday, November 19, 2020

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: 2040+Project
Road Name: 3rd Street
Road Segment: Victoria Avenue to Palm Avenue

Project Name: Airport Gateway Specific P
Job Number: 13635

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	24,799	vehicles
Peak Hour Percentage:	10.00%	
Peak Hour Volume:	2,480	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	27	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	50.0	feet
Centerline Dist. to Observer:	50.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.86%
Medium Trucks:	84.8%	4.9%	10.3%	1.28%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	48.402
Medium Trucks:	48.219
Heavy Trucks:	48.237

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.01	0.11	-1.20	-4.65	0.000	0.000
Medium Trucks:	79.45	-16.82	0.13	-1.20	-4.87	0.000	0.000
Heavy Trucks:	84.25	-18.55	0.13	-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
Autos:	69.4	67.5	65.7	59.7	68.3	68.9
Medium Trucks:	61.6	60.1	53.7	52.1	60.6	60.8
Heavy Trucks:	64.6	63.2	54.2	55.4	63.8	63.9
Vehicle Noise:	71.1	69.4	66.3	61.6	70.1	70.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	51	110	236	509
CNEL:	55	118	254	546

Thursday, November 19, 2020

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APPENDIX 9.1:

CADNAA OPERATIONAL NOISE MODEL INPUTS

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13635 - Airport Gateway Specific Plan

CadnaA Noise Prediction Model: 13635-05.cna
Date: 02.12.20
Analyst: S. Shami

Calculation Configuration

Configuration	
Parameter	Value
General	
Country	(user defined)
Max. Error (dB)	0.00
Max. Search Radius (#(Unit,LEN))	2000.01
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (#(Unit,LEN))	999.99
Min. Length of Section (#(Unit,LEN))	1.01
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	960.00
Reference Time Night (min)	480.00
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	5.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	2
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rvcr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Incl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (#(Unit,TEMP))	10
rel. Humidity (%)	70
Ground Absorption G	0.50
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (RLS-90)	
Strictly acc. to RLS-90	
Railways (FTA/FRA)	
Aircraft (???)	
Strictly acc. to AzB	

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Night	CNEL	Day	Night	CNEL	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
RECEIVERS		R1	62.9	62.9	69.5	65.0	65.0	0.0				5.00	a	6256637.16	2349146.71	5.00
RECEIVERS		R2	62.6	62.6	69.3	65.0	65.0	0.0				5.00	a	6259544.97	2349113.29	5.00
RECEIVERS		R3	62.6	62.6	69.3	65.0	65.0	0.0				5.00	a	6264103.35	2349115.17	5.00
RECEIVERS		R4	62.5	62.5	69.2	65.0	65.0	0.0				5.00	a	6267732.52	2349100.33	5.00
RECEIVERS		R5	60.9	60.9	67.5	65.0	65.0	0.0				5.00	a	6269011.54	2349027.90	5.00
RECEIVERS		R6	62.2	62.2	68.9	65.0	65.0	0.0				5.00	a	6272676.47	2349038.75	5.00
RECEIVERS		R7	62.5	62.5	69.1	65.0	65.0	0.0				5.00	a	6255701.79	2347355.30	5.00
RECEIVERS		R8	61.5	61.5	68.2	65.0	65.0	0.0				5.00	a	6255536.86	2348596.62	5.00

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL"			Lw / Li			Operating Time			Height
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	(ft)
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	
SITEBOUNDARY		SITEBOUNDARY00001	129.9	129.9	129.9	65.7	65.7	65.7	Lw"	65.7					8

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
SITEBOUNDARY	8.00	a			6255662.66	2349093.07	8.00	0.00
					6257652.24	2349051.41	8.00	0.00
					6257652.24	2348410.78	8.00	0.00

Name	Height		Coordinates			
	Begin	End	x	y	z	Ground
	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
			6259173.07	2348363.91	8.00	0.00
			6259178.28	2349030.57	8.00	0.00
			6266455.19	2349010.93	8.00	0.00
			6268807.27	2348982.11	8.00	0.00
			6268810.75	2348551.56	8.00	0.00
			6268859.36	2348530.73	8.00	0.00
			6270151.02	2348947.39	8.00	0.00
			6270373.25	2349013.36	8.00	0.00
			6270532.97	2349044.61	8.00	0.00
			6270751.72	2349065.45	8.00	0.00
			6271085.05	2349041.14	8.00	0.00
			6271651.02	2349006.42	8.00	0.00
			6272269.08	2348950.86	8.00	0.00
			6272630.19	2348919.61	8.00	0.00
			6272953.11	2348891.84	8.00	0.00
			6273314.22	2348916.14	8.00	0.00
			6273578.11	2348940.45	8.00	0.00
			6273776.02	2348975.17	8.00	0.00
			6273842.00	2349002.95	8.00	0.00
			6274026.02	2349138.36	8.00	0.00
			6274154.50	2349263.36	8.00	0.00
			6274182.27	2349242.53	8.00	0.00
			6274223.94	2349107.11	8.00	0.00
			6274248.25	2348836.28	8.00	0.00
			6274293.39	2348093.23	8.00	0.00
			6274265.61	2347423.09	8.00	0.00
			6272318.78	2347444.50	8.00	0.00
			6271463.74	2347127.66	8.00	0.00
			6270882.14	2347105.96	8.00	0.00
			6270322.25	2346936.69	8.00	0.00
			6270348.29	2347448.84	8.00	0.00
			6270257.14	2347466.20	8.00	0.00
			6268989.78	2347553.01	8.00	0.00
			6266585.27	2347661.51	8.00	0.00
			6265851.76	2347696.24	8.00	0.00
			6264050.55	2347713.60	8.00	0.00
			6262735.44	2347722.28	8.00	0.00
			6260955.93	2347761.34	8.00	0.00
			6260673.81	2347752.66	8.00	0.00
			6260339.61	2347600.75	8.00	0.00
			6259506.28	2347140.68	8.00	0.00
			6259332.66	2347032.17	8.00	0.00
			6259189.44	2346975.75	8.00	0.00
			6259102.63	2346954.05	8.00	0.00
			6258703.32	2346962.73	8.00	0.00
			6256008.01	2346988.77	8.00	0.00
			6256021.03	2347066.89	8.00	0.00
			6255630.41	2347561.69	8.00	0.00

APPENDIX 10.1:

CADNAA CONSTRUCTION NOISE MODEL INPUTS

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13635 - Airport Gateway Specific Plan

CadnaA Noise Prediction Model: 13635_Construction.cna
Date: 24.11.20
Analyst: S. Shami

Calculation Configuration

Configuration	
Parameter	Value
General	
Country	(user defined)
Max. Error (dB)	0.00
Max. Search Radius (#(Unit,LEN))	2000.01
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (#(Unit,LEN))	999.99
Min. Length of Section (#(Unit,LEN))	1.01
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	960.00
Reference Time Night (min)	480.00
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	5.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	2
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rvcr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Incl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (#(Unit,TEMP))	10
rel. Humidity (%)	70
Ground Absorption G	0.50
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (RLS-90)	
Strictly acc. to RLS-90	
Railways (FTA/FRA)	
Aircraft (???)	
Strictly acc. to AzB	

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Night	CNEL	Day	Night	CNEL	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
RECEIVERS		R1	72.5	72.5	79.1	60.0	55.0	0.0				5.00	a	6256637.16	2349146.71	5.00
RECEIVERS		R2	72.2	72.2	78.9	60.0	55.0	0.0				5.00	a	6259544.97	2349113.29	5.00
RECEIVERS		R3	72.2	72.2	78.9	60.0	55.0	0.0				5.00	a	6264103.35	2349115.17	5.00
RECEIVERS		R4	72.1	72.1	78.8	60.0	55.0	0.0				5.00	a	6267732.52	2349100.33	5.00
RECEIVERS		R5	70.5	70.5	77.1	60.0	55.0	0.0				5.00	a	6269011.54	2349027.90	5.00
RECEIVERS		R6	71.8	71.8	78.5	60.0	55.0	0.0				5.00	a	6272676.47	2349038.75	5.00
RECEIVERS		R7	72.1	72.1	78.7	60.0	55.0	0.0				5.00	a	6255701.79	2347355.30	5.00
RECEIVERS		R8	71.1	71.1	77.8	60.0	55.0	0.0				5.00	a	6255536.86	2348596.62	5.00

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL"			Lw / Li			Operating Time			Height
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	(ft)
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	
SITEBOUNDARY		SITEBOUNDARY00001	139.5	139.5	139.5	75.3	75.3	75.3	Lw"	75.3					8

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
SITEBOUNDARY	8.00	a			6255662.66	2349093.07	8.00	0.00
					6257652.24	2349051.41	8.00	0.00
					6257652.24	2348410.78	8.00	0.00

Name	Height		Coordinates			
	Begin	End	x	y	z	Ground
	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
			6259173.07	2348363.91	8.00	0.00
			6259178.28	2349030.57	8.00	0.00
			6266455.19	2349010.93	8.00	0.00
			6268807.27	2348982.11	8.00	0.00
			6268810.75	2348551.56	8.00	0.00
			6268859.36	2348530.73	8.00	0.00
			6270151.02	2348947.39	8.00	0.00
			6270373.25	2349013.36	8.00	0.00
			6270532.97	2349044.61	8.00	0.00
			6270751.72	2349065.45	8.00	0.00
			6271085.05	2349041.14	8.00	0.00
			6271651.02	2349006.42	8.00	0.00
			6272269.08	2348950.86	8.00	0.00
			6272630.19	2348919.61	8.00	0.00
			6272953.11	2348891.84	8.00	0.00
			6273314.22	2348916.14	8.00	0.00
			6273578.11	2348940.45	8.00	0.00
			6273776.02	2348975.17	8.00	0.00
			6273842.00	2349002.95	8.00	0.00
			6274026.02	2349138.36	8.00	0.00
			6274154.50	2349263.36	8.00	0.00
			6274182.27	2349242.53	8.00	0.00
			6274223.94	2349107.11	8.00	0.00
			6274248.25	2348836.28	8.00	0.00
			6274293.39	2348093.23	8.00	0.00
			6274265.61	2347423.09	8.00	0.00
			6272318.78	2347444.50	8.00	0.00
			6271463.74	2347127.66	8.00	0.00
			6270882.14	2347105.96	8.00	0.00
			6270322.25	2346936.69	8.00	0.00
			6270348.29	2347448.84	8.00	0.00
			6270257.14	2347466.20	8.00	0.00
			6268989.78	2347553.01	8.00	0.00
			6266585.27	2347661.51	8.00	0.00
			6265851.76	2347696.24	8.00	0.00
			6264050.55	2347713.60	8.00	0.00
			6262735.44	2347722.28	8.00	0.00
			6260955.93	2347761.34	8.00	0.00
			6260673.81	2347752.66	8.00	0.00
			6260339.61	2347600.75	8.00	0.00
			6259506.28	2347140.68	8.00	0.00
			6259332.66	2347032.17	8.00	0.00
			6259189.44	2346975.75	8.00	0.00
			6259102.63	2346954.05	8.00	0.00
			6258703.32	2346962.73	8.00	0.00
			6256008.01	2346988.77	8.00	0.00
			6256021.03	2347066.89	8.00	0.00
			6255630.41	2347561.69	8.00	0.00