11.13 Noise Assessment

Westside Annexation and North Lancaster Industrial Specific Plan

NOISE AND VIBRATION ANALYSIS

CITY OF LANCASTER

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LIST OF ABBREVIATED TERMS

(1)	Reference
ALUCP	Airport Land Use Compatibility Plan
ANSI	American National Standards Institute
Calveno	California Vehicle Noise
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dBA	A-weighted decibels
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FICON	Federal Interagency Committee on Noise
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
LMC	Lancaster Municipal Code
mph	Miles per hour
PPV	Peak Particle Velocity
Project	Westside Annexation and North Lancaster Industrial Specific Plan
REMEL	Reference Energy Mean Emission Level
RMS	Root-mean-square
SP	North Lancaster Industrial Specific Plan
TA	Westside Annexation and North Lancaster Industrial Specific Plan Local Transportation Assessment
VdB	Vibration Decibels

EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to determine the noise exposure and the necessary noise mitigation measures for the proposed Westside Annexation and North Lancaster Industrial Specific Plan development (Project). This noise study has been prepared to satisfy applicable City of Lancaster noise standards and significance criteria based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1)

The results of this Noise and Vibration Analysis are summarized below based on the significance criteria in Section 4 of this report consistent with Appendix G of the CEQA Guidelines. (1) 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	*Less Than Significant*	-
Construction Noise	10	*Less Than Significant*	-
Nighttime Concrete Pour		*Less Than Significant*	-
Construction Vibration		*Less Than Significant*	-

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1 INTRODUCTION

This Noise and Vibration Analysis has been completed to determine the noise impacts associated with the development of the Westside Annexation and North Lancaster Industrial Specific Plan ("Project"). This noise and vibration analysis briefly describes the Project, provides information regarding noise fundamentals, sets out the local regulatory setting, presents the study methods and procedures for noise analysis, evaluates the exterior noise environment, potential off-site traffic impacts, the Project-related long-term stationary-source operational noise, and Project-related short-term construction noise and vibration impacts.

1.1 SITE LOCATION

The Project site encompasses approximately 7,153 acres in the Antelope Valley portion of unincorporated Los Angeles County, as shown on Exhibit 1-A. The site is generally bound by Avenue B to the north, Sierra Highway and Edwards Air Force Base to the east, Avenue G to the south, and 30th Street West to the west. SR-14, Sierra Highway, 10th Street West, and 20th Street West transect the site in a north-south direction. Unincorporated Los Angeles County surrounds the Project site to the north, east, and west. The City of Lancaster is located to the south and west of the site.

1.2 PROJECT DESCRIPTION

The proposed Project involves two components: 1) annexation of the Project site from unincorporated Los Angeles County into the City of Lancaster jurisdiction and 2) adoption of the proposed North Lancaster Industrial Specific Plan (SP), which would allow up to approximately 38.5 million square feet of industrial development. The Project site encompasses approximately 7,153 acres in the Antelope Valley of unincorporated Los Angeles County.

Annexation (ANX24-002)

The proposed Project includes the annexation of approximately 7,153 acres currently in unincorporated Los Angeles County into the City's jurisdiction. There are six land use areas proposed within the Annexation Area: non-urban residential uses, multifamily residential (mobile home), mixed use (residential with retail, office, or service uses), light industrial, public uses, and the proposed SP. Exhibit 1-B identifies the proposed land use areas within the Annexation Area. The uses proposed within the Annexation Area (which does not include the Specific Plan Area) are summarized below:

- 5,793,480 sf of Industrial Park uses
- 3,620,925 sf of Warehousing uses
- 3,620,925 sf of High-Cube Parcel Hub uses
- 1,448,370 sf of High-Cube Cold Storage uses
- 719 Single Family Detached dwelling units (DUs)
- 683 Multifamily (Low-Rise) Residential DUs
- 435 Mobile Home Park DUs
- 1,110,780 sf of Business Park uses

EXHIBIT 1-A: LOCATION MAP

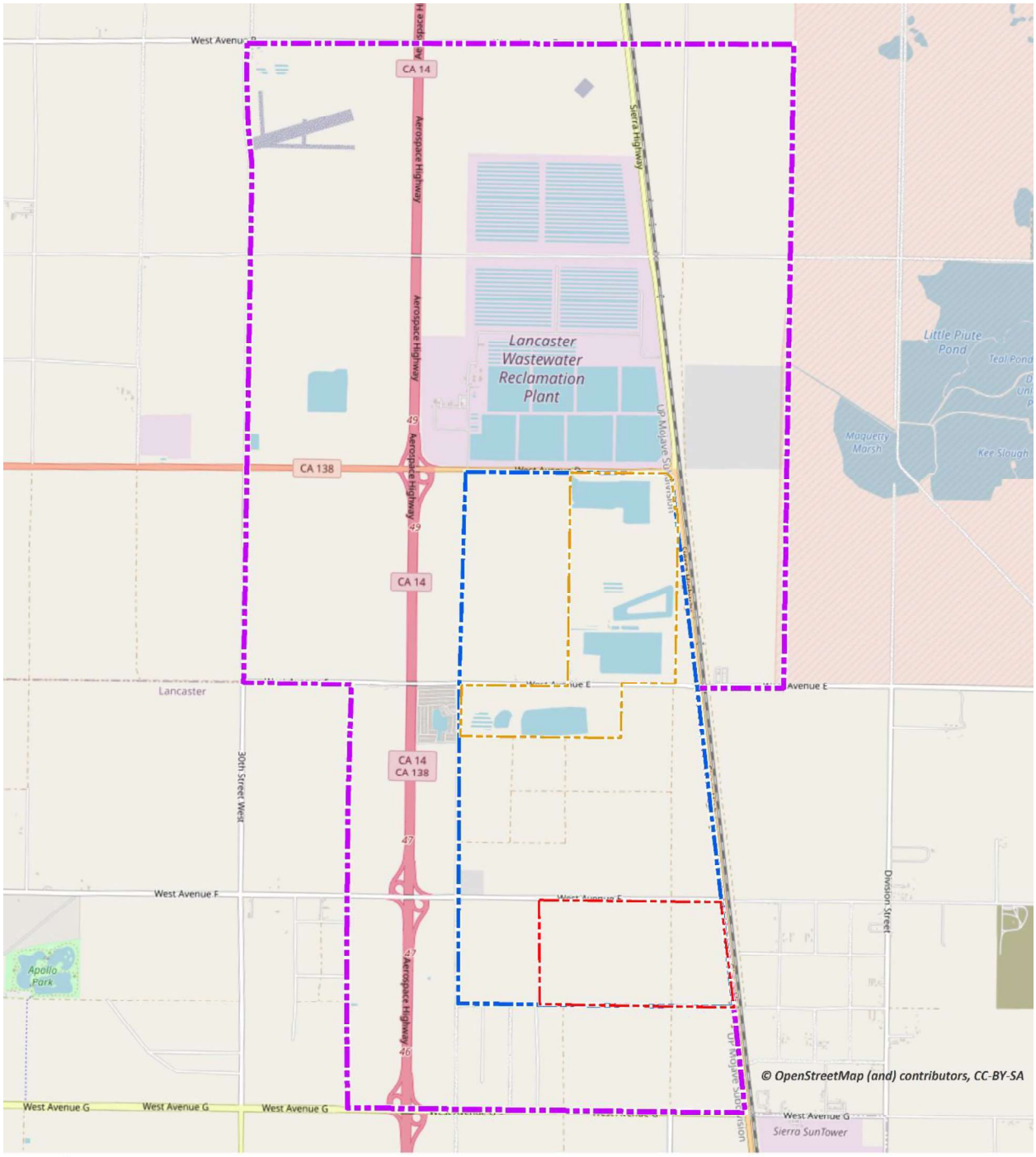
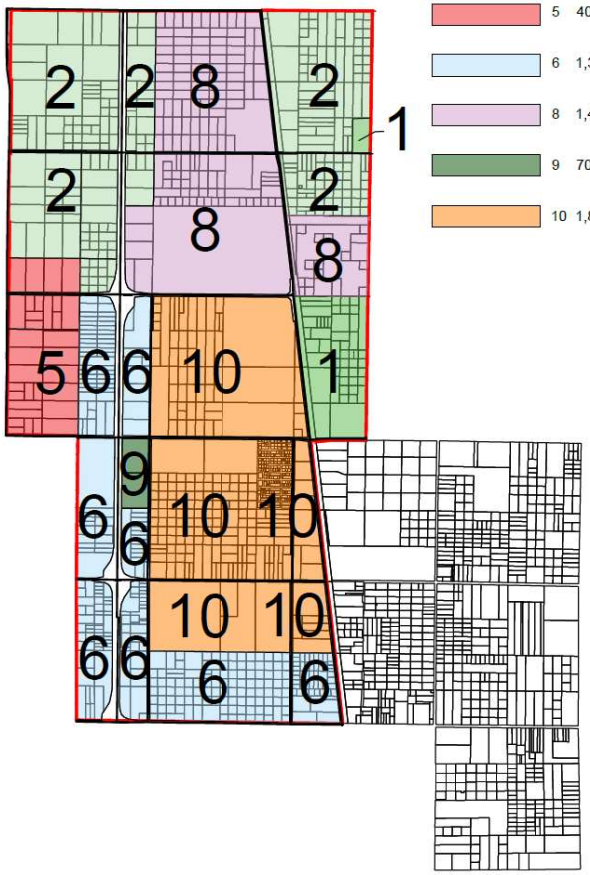


EXHIBIT 1-B: ANNEXATION AREA



LAND USE		LA COUNTY DESIGNATIONS	LANCASTER GP DESIGNATIONS	LANCASTER ZONING DESIGNATIONS
1	314 Acres	RL-20 RESIDENTIAL 1 DU/20 AC., EQUESTRIAN, AG USES	NU (NON-URBAN RESIDENTIAL 1 DU/2.5 AC. TO 2 DU/AC.	RR-2.5 (RURAL RESIDENTIAL 2.5, 1 DU/ 100,000 SF)
2	1,760 Acres	RL-10 RESIDENTIAL 1 DU/10 AC., EQUESTRIAN, AG USES	NU (NON-URBAN RESIDENTIAL 1 DU/2.5 AC. TO 2 DU/AC.	RR-2.5 (RURAL RESIDENTIAL 2.5, 1 DU/ 100,000 SF)
5	408 Acres	MU-R MIXED USE RURAL LOW INTENSITY COMMERCIAL, RESIDENTIAL	MU (MIXED USE) 21 DU/AC., 1.0 FAR RETAIL, OFFICE, SERVICE USES	MU-E (MIXED USE-EMPLOYMENT)
6	1,330 Acres	IL LIGHT INDUSTRIAL, 1.0 FAR, LIGHT MANUFACTURING, WAREHOUSES	LI LIGHT INDUSTRY	LI LIGHT INDUSTRY
8	1,415 Acres	P PUBLIC USES	P PUBLIC USES	P PUBLIC USES
9	70 Acres	RL-10 RESIDENTIAL 1 DU/10 AC., EQUESTRIAN, AG USE	MR1 MULTIPLE FAMILY RESIDENTIAL	MHP MOBILE HOME PARK
10	1,864 Acres	IL LIGHT INDUSTRIAL, 1.0 FAR, LIGHT MANUFACTURING, WAREHOUSES	SP SPECIFIC PLAN	SP SPECIFIC PLAN

Specific Plan (SP24-002)

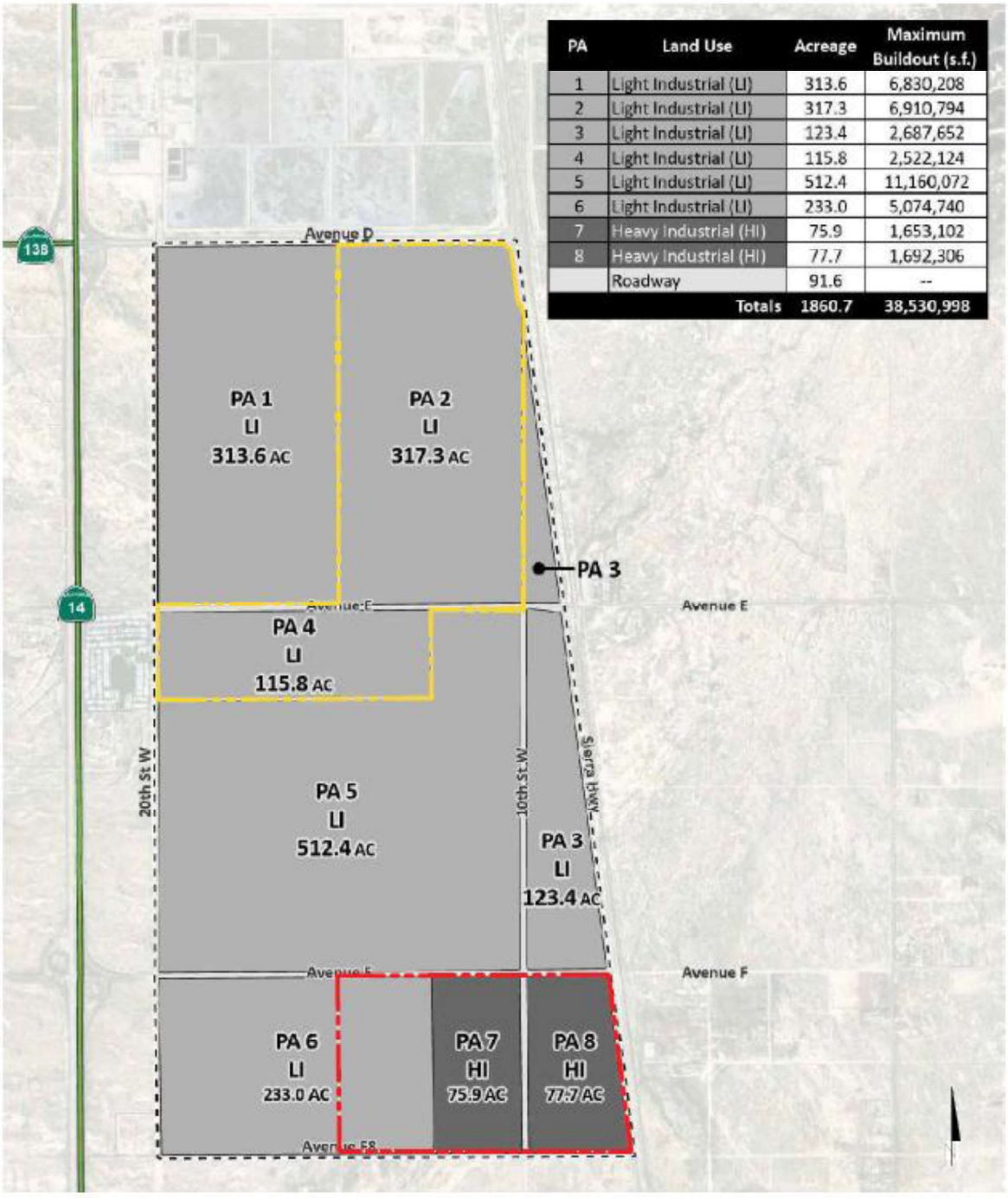
The North Lancaster Industrial Specific Plan would encompass approximately 1,860.7 acres in the central portion of the annexation area. The Specific Plan is proposed to allow for a site-specific land use plan, development standards, design guidelines, infrastructure systems, and implementation strategies on which subsequent development activities would be implemented. Exhibit 1-C illustrates the proposed land use plan for the Specific Plan area. As shown, the Specific Plan area would be separated into eight planning areas with Light Industrial and Heavy Industrial land use designations.

Within Planning Areas (PA) 2, 4, 6 (eastern half), 7, and 8, 11.3 million square feet of industrial warehouse buildings and associated site improvements are proposed.[1]. The proposed development would be constructed over a six-year duration. Planning Areas 1, 3, and 5 total 949.4 acres and would allow for up to 20,677,934 sf of development. A total of 2,015,072 square feet of warehouse space was previously approved in PA 6 (western half).

PAs 2, 4, 6 (eastern half), 7, and 8 are anticipated to have an opening year of 2031. This analysis also evaluates the noise impacts that would occur at buildout of the Annexation Areas and the remaining Specific Plan Planning Areas combined, with an assumed buildout year of 2040. At the time this analysis was prepared, the future tenants of the proposed Project were unknown, and therefore, this study includes a conservative analysis of the proposed Project uses.

[1] The western half of PA 6 has been previously entitled and its impacts analyzed in a previously approved CEQA document. In addition, the western half of PA 6 has been included as part of the cumulative background conditions that are reflected in the off-site traffic noise analysis presented in Section 7 of this report.

EXHIBIT 1-C: NORTH LANCASTER INDUSTRIAL SPECIFIC PLAN LAND USE PLAN



PA	Land Use	Acreage	Maximum Buildout (s.f.)
1	Light Industrial (LI)	313.6	6,830,208
2	Light Industrial (LI)	317.3	6,910,794
3	Light Industrial (LI)	123.4	2,687,652
4	Light Industrial (LI)	115.8	2,522,124
5	Light Industrial (LI)	512.4	11,160,072
6	Light Industrial (LI)	233.0	5,074,740
7	Heavy Industrial (HI)	75.9	1,653,102
8	Heavy Industrial (HI)	77.7	1,692,306
	Roadway	91.6	--
	Totals	**1860.7**	**38,530,998**

LEGEND:

PAs 2 & 4 Project Boundary

PAs 6 (East Half), 7 & 8 Project Boundary

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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		

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

2.1 RANGE OF NOISE

Since the range of intensities that the human ear can detect is so large, the scale frequently used to measure intensity is a scale based on multiples of 10, the logarithmic scale. The scale for measuring intensity is the decibel scale. Each interval of 10 decibels indicates a sound energy ten times greater than before, which is perceived by the human ear as being roughly twice as loud. (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 1,000 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 metric 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 and is commonly used to describe the "average" noise levels within the environment.

Peak hour or average noise levels, while useful, do not completely describe a given noise environment. Noise levels lower than peak hour may be disturbing if they occur during times when quiet is most desirable, namely evening and nighttime (sleeping) hours. To account for this, the 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 noise can become more intrusive. CNEL does not represent the actual sound level heard at any time, but rather represents the total sound exposure. The City of Lancaster 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 nearby 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. (5)

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 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 block the line-of-sight path of sound from the noise source.

2.6 LAND USE COMPATIBILITY WITH NOISE

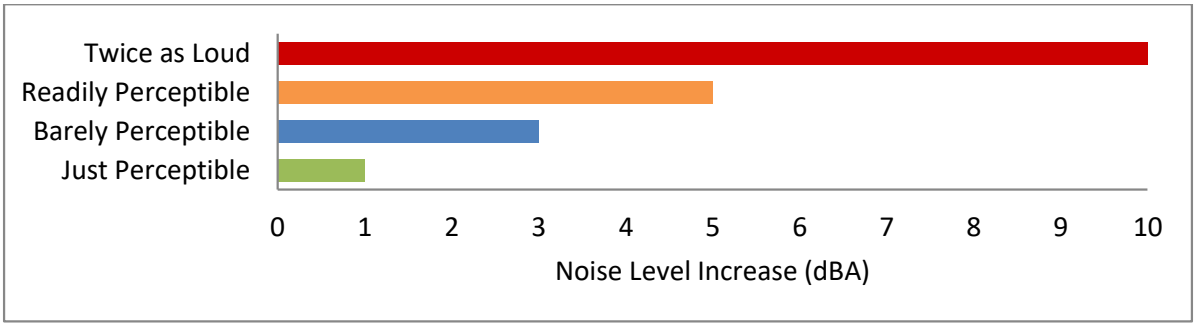
Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches, and residences are more sensitive to noise intrusion than commercial or industrial developments and related activities. As ambient noise levels affect the perceived amenity or livability of a development, 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. (6)

2.7 COMMUNITY RESPONSE TO NOISE

Approximately sixteen 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 may occur. Twenty to thirty percent of the population will not complain even in very severe noise environments. (7 pp. 8-6) Thus, a variety of reactions can be expected from people exposed to any given noise environment.

Surveys have shown that community response to noise varies from no reaction to vigorous action for newly introduced noises averaging from 10 dB below existing to 25 dB above existing. (8) According to research originally published in the Noise Effects Handbook (7), the percentage of high annoyance ranges from approximately 0 percent at 45 dB or less, 10 percent are highly annoyed around 60 dB, and increases rapidly to approximately 70 percent being highly annoyed at approximately 85 dB or greater. 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 is considered barely perceptible, and changes of 5 dBA are considered readily perceptible. (4)

EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION



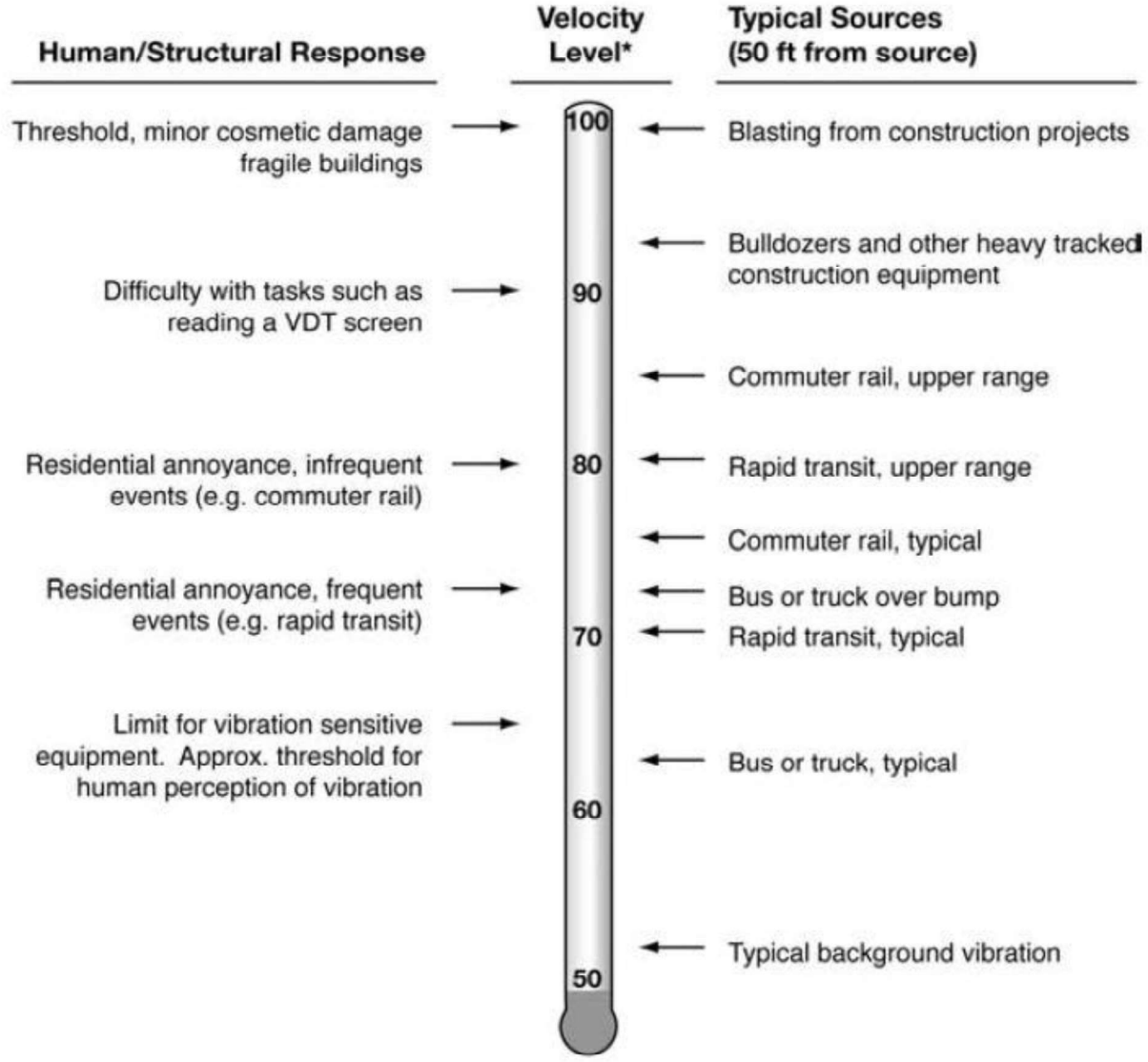
2.8 VIBRATION

Per the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual*, 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. Additionally, in contrast to airborne noise, ground-borne vibration outdoors is not a common environmental problem and annoyance from ground-borne vibration is almost exclusively an indoor phenomenon (8). Therefore, the effects of vibrations should only be evaluated at a structure and the effects of the building structure on the vibration should be considered. Wood-frame buildings, such as typical residential structures, are more easily excited by ground vibration than heavier buildings. In contrast, large masonry buildings with spread footings have a low response to ground vibration (8). In general, the heavier a building is, the lower the response will be to the incident vibration energy. However, all structurers reduce vibration levels due to the coupling of the building to the soil.

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 (8). 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 (8). However, the RMS amplitude and PPV are related mathematically, and the RMS amplitude of equipment is typically calculated from the PPV reference level. The RMS amplitude is approximately 70% of the PPV (9). Thus, either can be used in the description of vibration impacts.

While not universally accepted, vibration decibel notation (VdB) is another vibration notation developed and used by the FTA in their guidance manual to describe vibration levels and provide a background of common vibration levels and set vibration limits. (8) Decibel notation (VdB) serves to reduce the range of numbers used to describe vibration levels and is used in this report to describe vibration levels. As stated in the FTA guidance manual, the background vibration-velocity level in residential areas is generally 50 VdB. Ground-borne vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground-borne vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Exhibit 2-C illustrates common vibration sources and the human and structural response to ground-borne vibration

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



** RMS Vibration Velocity Level in VdB relative to 10^{-6} inches/second*

Source: Federal Transit Administration (FTA) Transit Noise 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). (10) 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 CITY OF LANCASTER GENERAL PLAN SAFETY ELEMENT

The City of Lancaster has included a Noise section in the Safety Element (11) of the General Plan to control and abate environmental noise, and to protect the citizens of Lancaster from excessive exposure to noise. The Noise section specifies the maximum exterior noise levels allowable for new developments impacted by transportation noise sources such as arterial roads, freeways, airports and railroads. To protect City of Lancaster residents from excessive noise, the Noise section contains the following goal related to the Project:

Goal 4.3 *Promote noise-compatible land use relationships by implementing the noise standards identified in Table 4-3 to be utilized for design purposes in new development and establishing a program to attenuate the existing noise problem.*

To ensure noise issues are addressed (Goal 4-3), the Noise section identifies the following policies:

4.3.1 Ensure that noise-sensitive land uses and noise generators are located and designed so that City noise objectives will be achieved.

4.3.2 Wherever feasible, manage the generation of single event noise levels (SENL) from motor vehicles, trains, aircraft, commercial, industrial, construction, and other activities such that SENL levels are no greater than 15 dBA above the noise objectives included in the Plan for Public Health and Safety.

4.3.3 Ensure that the provision of noise attenuation does not create significant negative visual impacts.

The City of Lancaster General Plan Noise section specifies the noise levels allowable for new developments. The *Noise Compatible Land Use Objectives* (Table 4-3 in the Safety Element; Exhibit 3-A below) identify an exterior noise level of 70 dBA CNEL for industrial uses and 65 dBA CNEL residential land uses. The City of Lancaster General Plan Noise section standards are shown on Exhibit 3-A.

EXHIBIT 3-A: NOISE COMPATIBLE LAND USE OBJECTIVES

Land Use	Maximum Exterior CNEL	Maximum Interior CNEL
Rural, Single-Family, Multi-Family Residential	65 dBA	45 dBA
Schools: Classrooms Playgrounds	65 dBA 70 dBA	45 dBA --
Libraries	--	50 dBA
Hospitals/Convalescent Facilities: Living Areas Sleeping Areas	-- --	50 dBA 40 dBA
Commercial and Industrial Office Areas	70 dBA --	-- 50 dBA

Source: City of Lancaster General Plan, Safety Element, Table 4-3.

3.3 OPERATIONAL NOISE STANDARDS

To analyze noise impacts originating from a designated fixed location or private property, stationary-source (operational) noise such as the expected cold storage loading dock activity, tractor trailer storage activity, roof-top air conditioning units, parking lot vehicle movements, trash enclosure activity, and truck movements are typically evaluated against standards established under a jurisdiction's municipal code. Section 8.24.030 of the City of Lancaster Municipal Code (LMC) included in Appendix 3.1 states that *no person shall make, cause or suffer, or permit to be made upon any premises owned, occupied or controlled by him/her any unnecessary noises or sounds which are physically annoying to persons of ordinary sensitiveness which are so harsh or so prolonged or unnatural or unusual in their use, time, or place as to occasion physical discomfort to the inhabitants of any neighborhood*. However, the LMC does not identify specific exterior noise level standards for non-residential zones. (12)

To control operational noise source activities, the City of Lancaster General Plan Safety Element Table 4-3 presented in Exhibit 3-A above, outline the 24-hour CNEL noise level limits by land use type. For noise sensitive residential land uses, the Noise Compatible Land Use Objectives identify an exterior noise level limit of 65 dBA CNEL.According to the City of Lancaster General Plan 2030 Master Environmental Assessment (MEA), (13) both stationary and mobile noise sources within Lancaster need to be considered. Stationary sources of noise include airports, industrial and construction activities, air conditioning and refrigeration units, whistles or bells (signaling breaks or shift changes), high level radio, stereo, or television usage, power tools, lawnmowers, appliances used in the home, and barking dogs. Noise associated with these sources may

represent a single event noise occurrence, short-term, or long-term/continuous noise. As stated above, the City of Lancaster established maximum exterior and interior noise levels for land uses in the City; refer to Table 8-10 in the MEA; Exhibit 3-A above. Mobile noise sources are typically transportation-related and include aircraft, trains, automobiles, trucks, buses, and off-road vehicles. Vehicular traffic noise is subject to the noise standards identified in Table 8-10 in the MEA; Exhibit 3-A above. Since mobile noise sources are often associated with traffic volumes, these impacts are many times categorized as long-term noise impacts.

3.4 CONSTRUCTION NOISE STANDARDS

To control noise impacts associated with the construction of the proposed Project, the City of Lancaster has established limits to the hours of operation. The LMC has set restrictions on the hours during which construction activity may take place. LMC Section 8.24.040, *Loud, unnecessary and unusual noises prohibited – Construction and Building,* indicates that *a person at any time on Sunday or any day between the hours of 8:00 p.m. and 7:00 a.m. shall not perform any construction or repair work of any kind upon any building or structure or perform any earth excavating, filling or moving where any of the foregoing entails the use of any air compressor, jack hammer, power-driven drill, riveting machine, excavator, diesel-powered truck, tractor or other earth moving equipment, hard hammers on steel or iron or any other machine tool, device or equipment which makes loud noises within 500 feet of an occupied dwelling, apartment, hotel, mobile home or other place of residence.* (12) Therefore, the Project's construction activity shall be limited to the permitted hours of 7:00 a.m. to 8:00 p.m. on any day with no activity allowed on Sundays.

According to the FTA *Transit Noise and Vibration Impact Assessment Manual,* local noise ordinances are typically not very useful in evaluating construction noise impacts. 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. (8 p. 172)

Due to the lack of standardized construction noise thresholds, the FTA provides guidelines that can be considered reasonable criteria for construction noise assessments. The FTA identifies two types of construction noise assessment criteria, general and detailed. For general construction noise assessments, the analysis is limited to the two noisiest pieces of equipment with an hourly daytime exterior noise level threshold for residential land use of 90 dBA $L_{eq(1hr)}$. (8 p. 179) However, for long-term construction projects that would expose sensitive receivers to noise for extended periods of time, the FTA considers a daytime 8-hour average exterior construction noise level of 80 dBA $L_{eq(8hr)}$. The absolute FTA thresholds are intended to account for reasonable expectations regarding construction noise during the daytime hours and are intended to protect human health. Therefore, to evaluate whether the Project will generate potentially significant short-term noise levels at nearby noise sensitive residential receiver locations, a daytime exterior construction noise level of 80 dBA L_{eq} is used as a reasonable threshold to assess construction

noise level impacts based on the FTA detailed analysis construction noise criteria with a nighttime exterior construction noise level of 70 dBA L_{eq}. (8 p. 179)

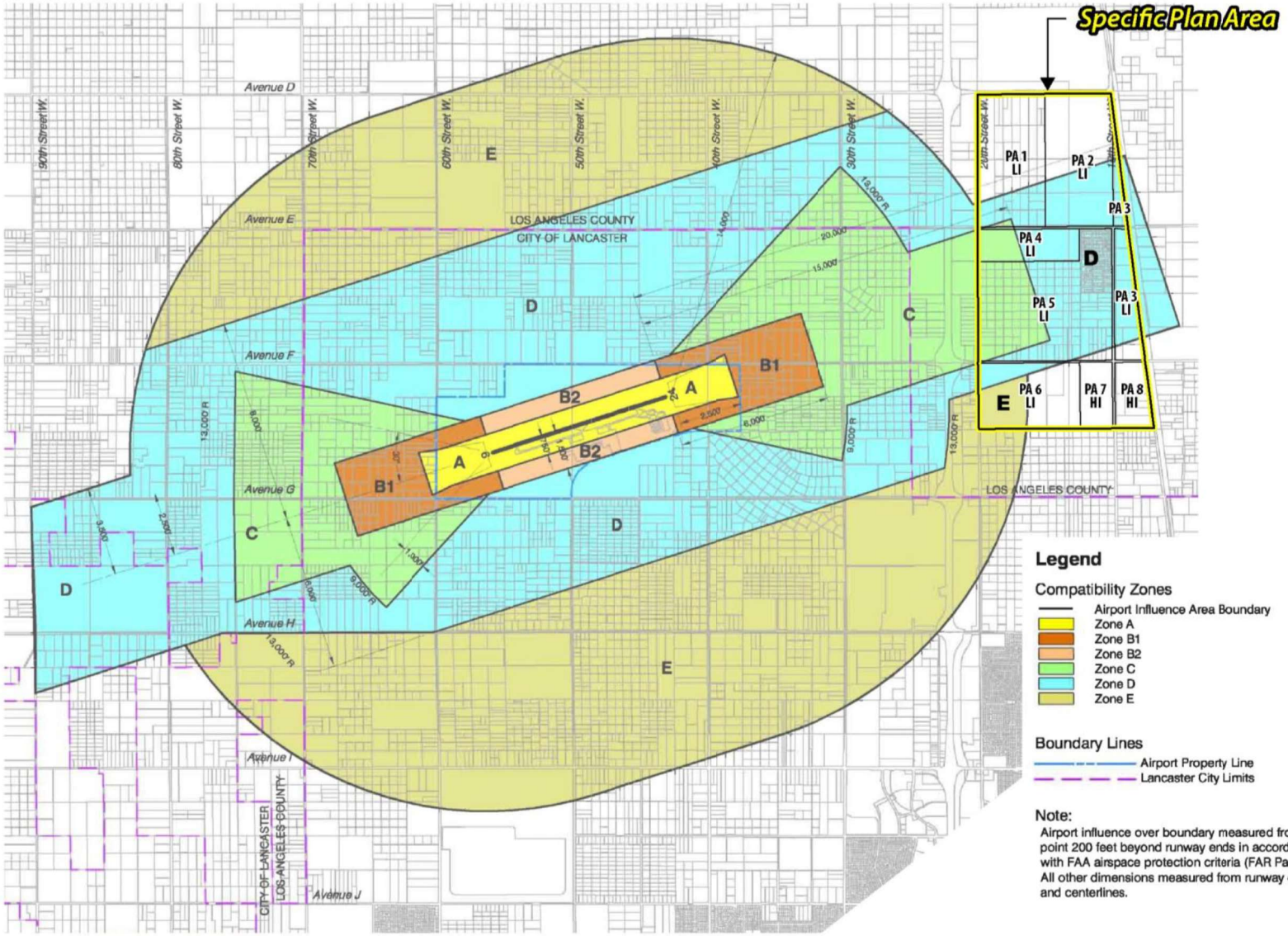
3.5 CONSTRUCTION VIBRATION STANDARDS

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. (8) To analyze vibration impacts originating from the operation and construction of the Westside Annexation and North Lancaster Industrial Specific Plan, vibration-generating activities are appropriately evaluated against standards established under a City's Municipal Code, if such standards exist. However, the City of Lancaster do not identify specific construction vibration level limits. Therefore, for analysis purposes, the Caltrans *Transportation and Construction Vibration Guidance Manual*, (9 p. 38) Table 19, vibration damage are used in this noise study to assess potential temporary construction-related impacts at adjacent building locations. The nearest noise sensitive buildings can best be described as "older residential structures" with a maximum acceptable continuous vibration threshold of 0.3 PPV (in/sec).

3.6 GENERAL WILLIAM J. FOX AIRFIELD LAND USE COMPATIBILITY

General William J. Fox Airfield is a regional general aviation facility serving the cities of Lancaster and Palmdale as well as unincorporated communities in northern Los Angeles County. (13) The airport produces a minor amount of aircraft noise and is currently the only general aviation facility within the City of Lancaster. Additionally, all of the land within a mile of the airport boundary has been zoned for industrial use. (13) The General William J. Fox Airfield Land Use Compatibility Plan (ALUCP) includes the policies for determining the land use compatibility of the Project. (14) The purpose of the noise policies is to avoid the establishment of noise-sensitive land use in the portions of airport environs that are exposed to significant levels of aircraft noise (Policy 2.2.1). As shown in Exhibit 3-B, portions of the Project are located within ALUCP Compatibility Zones C, D and E. According to Table 2B of the ALUCP, the noise impacts for Compatibility Zones C and D are *moderate* with *low* noise impacts in Compatibility Zone E.

EXHIBIT 3-B: GENERAL WILLIAM J. FOX AIRFIELD COMPATIBILITY MAP



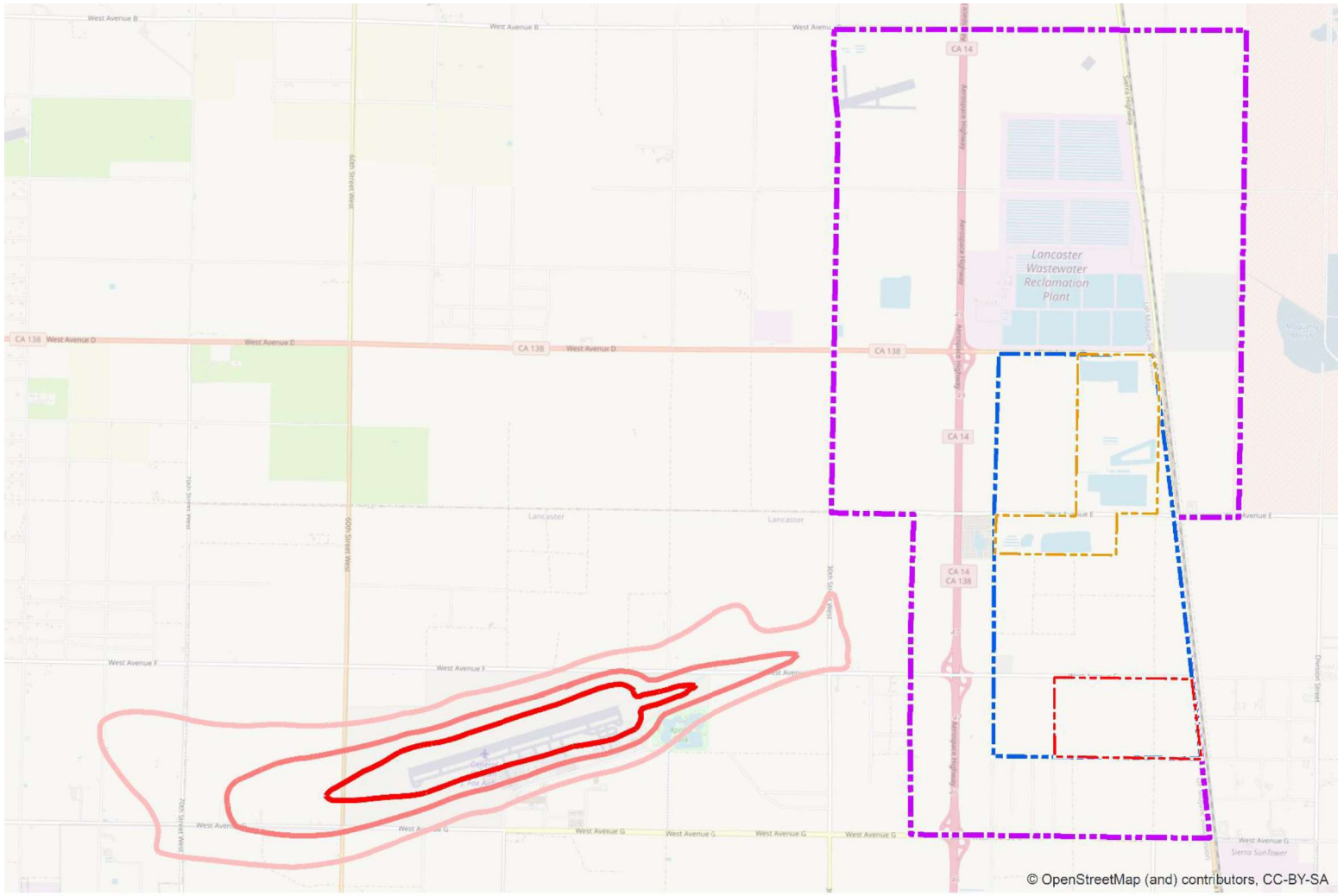
While Exhibit 3-B presents the Land Use Compatibility Zones, ALUCP Policy 2.2.2 requires the use of the CNEL Noise Contours for Compatibility Planning (Figure 2B in the ALUCP; Exhibit 3-C below) as the primary determinant of whether the proposed development in the airport vicinity will be compatible with the noise impacts of General William J. Fox Airfield. Examples of the acceptable noise levels for land uses in the airport's vicinity are presented below (Table 2C in the ALUCP, Exhibit 3-D).

The Noise Compatibility Criteria outlined in Exhibit 3-D shows that land uses exposed to exterior noise levels of less than 55 dBA CNEL are considered *clearly acceptable* or *normally acceptable.* Since all the Project land uses are located outside the 55 dBA CNEL noise exposure contour, the noise impacts from General William J. Fox Airfield are considered *less than significant.*

3.7 ROSAMOND SKYPARK LAND USE COMPATIBILITY

Rosamond Skypark is a residential and public-use airport located in the unincorporated community of Rosamond in Kern County. According to the County of Kern ALUCP, (15) the airport's land use compatibility area extends approximately 5,000 feet from the runway. This area lies about 3.5 miles northwest of the Specific Plan. Because all proposed project land uses fall outside both the designated land use compatibility area and the documented noise contours boundaries of the Rosamond Skypark, noise impacts associated with the airport are considered *less than significant*.

EXHIBIT 3-C: GENERAL WILLIAM J. FOX NOISE CONTOURS FOR COMPATIBILITY PLANNING



LEGEND:

- Annexation Area
- Specific Plan Area
- PA's 2 & 4 Project Boundary
- PA's 6, 7 & 8 Project Boundary
- 65 dBA CNEL
- 60 dBA CNEL
- 55 dBA CNEL

Source: General William J. Fox Airfield Land Use Compatibility Plan (ALUCP) Figure 2B.

EXHIBIT 3-D: GENERAL WILLIAM J. FOX NOISE COMPATIBILITY CRITERIA

Land Use Category	CNEL (dB) 50–55	55–60	60–65	65–70	70–75
Residential					
single-family, nursing homes, mobile homes	++	o	–	– –	– –
multi-family, apartments, condominiums	++	+	o	– –	– –
Public					
schools, libraries, hospitals	+	o	–	– –	– –
churches, auditoriums, concert halls	+	o	o	–	– –
transportation, parking, cemeteries	++	++	++	+	o
Commercial and Industrial					
offices, retail trade, restaurants	++	+	o	o	–
service commercial, wholesale trade, warehousing, light industrial	++	++	+	o	o
general manufacturing, utilities, extractive industry	++	++	++	+	+
Agricultural and Recreational					
cropland	++	++	++	++	+
livestock breeding	++	+	o	o	–
parks, playgrounds, zoos	++	+	+	o	–
golf courses, riding stables, water recreation	++	++	+	o	o
outdoor spectator sports	++	+	+	o	–
amphitheaters	+	o	–	– –	– –

Land Use Acceptability		Interpretation/Comments
++	*Clearly Acceptable*	The activities associated with the specified land use can be carried out with essentially no interference from the noise exposure.
+	*Normally Acceptable*	Noise is a factor to be considered in that slight interference with outdoor activities may occur. Conventional construction methods will eliminate most noise intrusions upon indoor activities.
o	*Marginally Acceptable*	The indicated noise exposure will cause moderate interference with outdoor activities and with indoor activities when windows are open. The land use is acceptable on the conditions that outdoor activities are minimal and construction features which provide sufficient noise attenuation are used (e.g., installation of air conditioning so that windows can be kept closed). Under other circumstances, the land use should be discouraged.
–	*Normally Unacceptable*	Noise will create substantial interference with both outdoor and indoor activities. Noise intrusion upon indoor activities can be mitigated by requiring special noise insulation construction. Land uses which have conventionally constructed structures and/or involve outdoor activities which would be disrupted by noise should generally be avoided.
– –	*Clearly Unacceptable*	Unacceptable noise intrusion upon land use activities will occur. Adequate structural noise insulation is not practical under most circumstances. The indicated land use should be avoided unless strong overriding factors prevail and it should be prohibited if outdoor activities are involved.

Source: General J. Fox Airfield Land Use Compatibility Plan Table 2C.

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?

4.1 NOISE LEVEL INCREASES (THRESHOLD A)

Noise level increases resulting from the Project are evaluated based on the Appendix G CEQA Guidelines. Under CEQA, consideration must be given to the magnitude of the increase, the existing baseline ambient noise levels, and the location of receivers to determine if a noise increase represents a significant adverse environmental impact. This approach recognizes *that there is no single noise increase that renders the noise impact significant.* (15) 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 level exceeds the previously existing ambient noise level, the less acceptable the new noise level will typically be judged.

4.1.1 NOISE SENSITIVE RECEIVERS (SUBSTANTIAL PERMANENT NOISE LEVEL INCREASE)

The Federal Interagency Committee on Noise (FICON) (16) developed guidance to be used for the assessment of project-generated increases in noise levels that consider the ambient noise level. The FICON recommendations are based on studies that relate aircraft noise levels to the percentage of persons highly annoyed by aircraft noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, these recommendations are often used in environmental noise impact assessments involving the use of cumulative noise exposure metrics, such as the average-daily noise level (CNEL) and equivalent continuous noise level (L_{eq}).

As previously stated, the approach used in this noise study recognizes *that there is no single noise increase that renders a noise impact significant*, based on a 2008 California Court of Appeal ruling on Gray v. County of Madera. (15) For example, if the ambient noise environment is quiet (<60 dBA) and the new noise source greatly increases the noise levels, an impact may occur if the noise criteria may be exceeded. Therefore, for this analysis, a *readily perceptible* 5 dBA or greater project-related noise level increase is considered a significant impact when the without project noise levels are below 60 dBA. Per the FICON, in areas where the without project noise levels range from 60 to 65 dBA, a 3 dBA *barely perceptible* noise level increase appears to be

appropriate for most people. When the without project noise levels already exceed 65 dBA, any increase in community noise louder than 1.5 dBA or greater is considered a significant impact if the noise criteria for a given land use is exceeded, since it likely contributes to an existing noise exposure exceedance.

The FICON guidance provides an established source of criteria to assess the impacts of substantial temporary or permanent increase in baseline ambient noise levels. Based on the FICON criteria, the amount to which a given noise level increase is considered acceptable is reduced when the without Project (baseline) noise levels are already shown to exceed certain land-use specific exterior noise level criteria. The specific levels are based on typical responses to noise level increases of 5 dBA or *readily perceptible*, 3 dBA or *barely perceptible*, and 1.5 dBA depending on the underlying without Project noise levels for noise-sensitive uses. These levels of increases and their perceived acceptance are consistent with guidance provided by both the Federal Highway Administration (4 p. 9) and Caltrans (17 p. 2_48).

4.1.2 NON-NOISE SENSITIVE RECEIVERS (SUBSTANTIAL PERMANENT NOISE LEVEL INCREASE)

The City of Lancaster General Plan *Noise Compatible Land Use Objectives* was used to establish the satisfactory noise levels of significance for the non-noise-sensitive land uses in the Project study area. As previously shown on Exhibit 3-A, a maximum exterior noise level criteria of 70 dBA CNEL is used to describe non-noise-sensitive land use. To determine if Project-related traffic noise increases are significant at off-site non-noise-sensitive land uses, a *barely perceptible* 3 dBA criteria is used. When the without Project noise levels are greater than the *normally acceptable* 70 dBA CNEL land use criteria, a *barely perceptible* 3 dBA or greater noise level increase is considered a significant impact since the noise level criteria is already exceeded. The noise level increases used to determine significant impacts for non-noise-sensitive land uses is generally consistent with the FICON noise level increase thresholds for noise-sensitive land uses but instead rely on the City of Lancaster *Noise Compatible Land Use Objectives* 70 dBA CNEL exterior noise level criteria for non-noise sensitive land uses.

4.1.3 CONSTRUCTION NOISE (SUBSTANTIAL TEMPORARY NOISE LEVEL INCREASE)

To control the noise-generating construction activities, the temporary noise level increases over the existing *ambient* conditions must be considered under CEQA Significance Threshold A. While the City of Lancaster does not identify a specific construction related noise level increase threshold, the City of Lancaster General Plan Noise Policy 4.3.2 outlines the maximum acceptable increase necessary to promote noise-compatible land use relationships. Therefore, if the Project-related construction noise levels generate a temporary noise level increase above the existing ambient noise levels of up to 15 dBA, consistent with City of Lancaster General Plan Noise Policy 4.3.2, then the Project construction noise increases will be considered a *potentially significant impact*.

4.2 VIBRATION (THRESHOLD B)

As described in Section 3.5, the vibration impacts originating from the construction of the Westside Annexation and North Lancaster Industrial Specific Plan, vibration-generating activities are appropriately evaluated using standards established by the Caltrans *Transportation and Construction Vibration Guidance Manual*, Table 19 and 20. The Caltrans' vibration thresholds for building damage and human annoyance are used in this noise study to assess potential operational and temporary construction-related impacts at adjacent building locations. A maximum acceptable continuous vibration threshold of 0.3 PPV (in/sec) is used to describe the nearest residential buildings adjacent to the Project site.

4.3 CEQA GUIDELINES NOT FURTHER ANALYZED (THRESHOLD C)

CEQA Noise Threshold C applies when there are nearby public and private airports and/or airstrips and focuses on land use compatibility of the Project to nearby airports and airstrips. The closest airport is General William J. Fox Airfield, located over 2 miles west of the Project. As previously indicated in Section 3.6, the noise contour boundaries of General William J. Fox Airfield presented on Exhibit 3-C of this report show that the land uses are considered *clearly acceptable and normally acceptable* since the development area is located outside the 55 dBA CNEL contour. In addition, the proposed project land uses fall outside both the designated land use compatibility area and the documented noise contours boundaries of the Rosamond Skypark. . Therefore, the Project impacts are considered *less than significant,* and no further noise analysis is provided under CEQA Significance Criteria C

4.4 SIGNIFICANCE CRITERIA SUMMARY

Noise impacts shall be considered significant if any of the following occur as a direct result of the proposed development. Table 4-1 shows the significance criteria summary matrix that includes the allowable criteria used to identify potentially significant incremental noise level increases.

TABLE 4-1: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Receiving Land Use	Condition(s)	Significance Criteria	
			Daytime	Nighttime
Off-Site	Noise-Sensitive[1]	if ambient is < 60 dBA CNEL	≥ 5 dBA CNEL Project increase	
		if ambient is 60 - 65 dBA CNEL	≥ 3 dBA CNEL Project increase	
		if ambient is > 65 dBA CNEL	≥ 1.5 dBA CNEL Project increase	
	Non-Noise-Sensitive[2]	if ambient is > 70 dBA CNEL	≥ 3 dBA CNEL Project increase	
Operational	Noise-Sensitive	if ambient is 60 - 65 dBA Leq[1]	≥ 3 dBA L_{eq} Project increase	
		if ambient is > 65 dBA Leq[1]	≥ 1.5 dBA L_{eq} Project increase	
Construction	Noise-Sensitive	Noise Level Threshold[4]	80 dBA L_{eq}	70 dBA L_{eq}
		Exterior Noise Level Increase[5]	15 dBA L_{eq}	
		Vibration Level Threshold[6]	0.3 PPV (in/sec)	

[1] FICON, 1992.
[2] The City of Lancaster General Plan Safety Element Noise Compatible Land Use Objectives (Exhibit 3-A)
[3] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual.
[4] City of Lancaster General Plan Safety Element Policy 4.3.2.
[5] Caltrans Transportation and Construction Vibration Guidance Manual, April 2020 Table 19;"PPV" = peak particle velocity

5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, 24-hour noise level measurements were taken at six 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, long-term noise level measurements were collected by Urban Crossroads, Inc. on Tuesday, December 14, 2024. Appendix 5.1 includes study area photos.

5.1 MEASUREMENT PROCEDURE AND CRITERIA

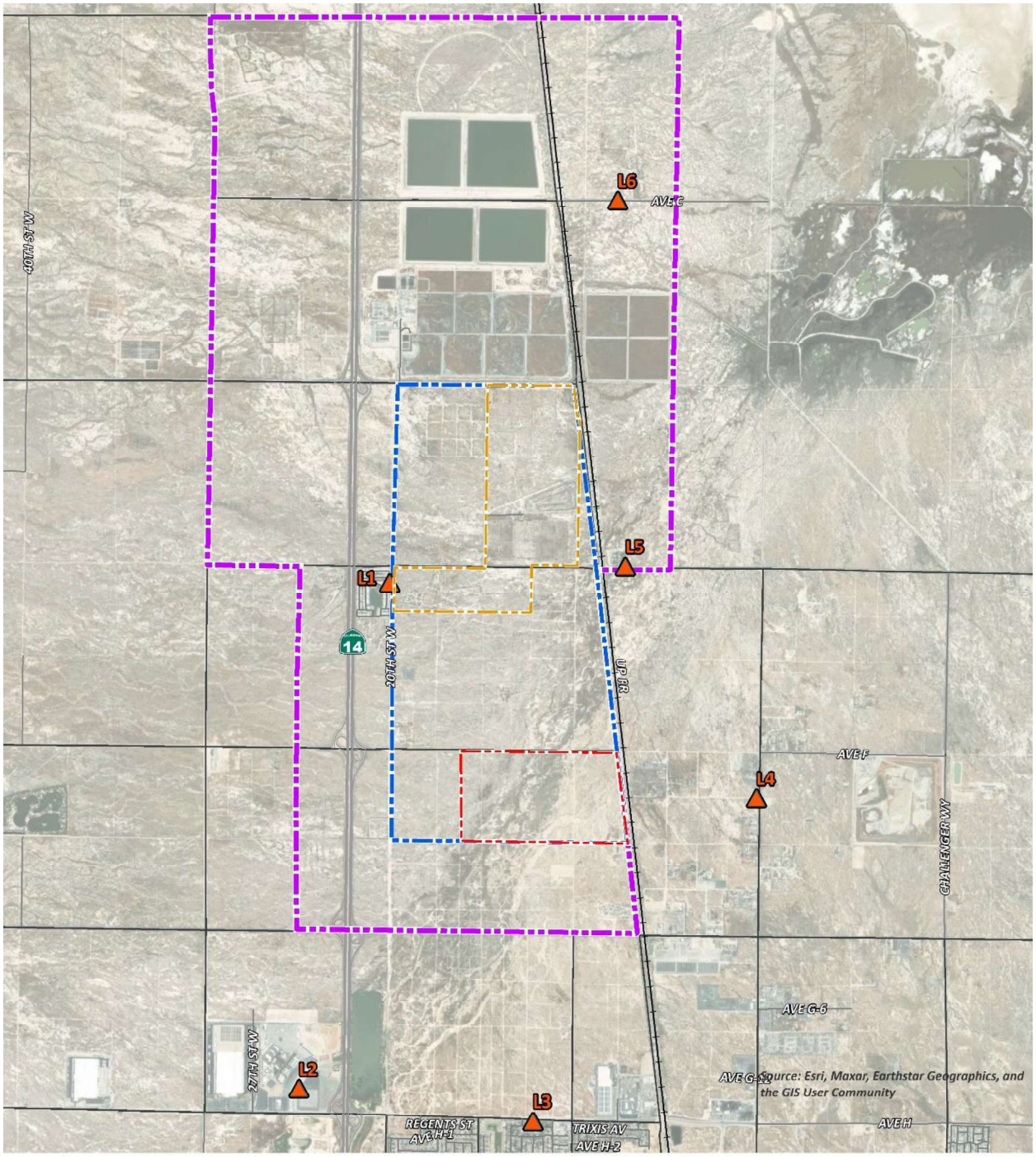
To describe the existing noise environment, the hourly noise levels were measured during typical weekday conditions over a 24-hour period. By collecting individual hourly noise level measurements, it is possible to describe the equivalent daytime and nighttime hourly noise levels. The long-term noise 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. (18)

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 equivalent 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*. (8)

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. (8) 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 Background (2031) noise level impacts.

EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS



5.3 NOISE MEASUREMENT RESULTS

The noise measurements presented below on Table 5-1 focus on the overall 24-hour CNEL noise levels necessary to demonstrate compliance with the *Noise Compatible Land Use Objectives* outlined above in Exhibit 3-A. In addition, Table 5-1 presents the equivalent or the hourly energy average sound levels (L_{eq}) necessary to describe the to describe the existing *ambient* conditions. Table 5-1 provides the (energy average) noise levels used to describe the hourly daytime and nighttime noise levels at each noise level measurement location. 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. The daytime and nighttime equivalent noise levels represent the average of all hourly noise levels observed during these time periods expressed as a single number.

TABLE 5-1: AMBIENT NOISE LEVEL MEASUREMENTS

Location[1]	Description	Energy Average Noise Level (dBA L_{eq})[2]		CNEL[2]
		Daytime	Nighttime	
L1	Located west of the SP within the Leisure Lake Mobile Estates near the residence at 48303 20th Street West.	56.4	48.9	57.9
L2	Located southwest of the SP at the southern entry for the Antelope Valley Fairgrounds at 2551 Avenue G8.	65.7	55.1	65.6
L3	Located south of the SP near the existing single-family residence at 1145 Regents Street.	72.6	64.6	73.8
L4	Located east of the SP at the southwest corner of the intersection of Division Street and W Avenue F4.	55.0	47.7	56.5
L5	Located east of the SP within Mitchell's Avenue E RV Park at 721 Avenue E.	70.4	59.8	70.6
L6	Located northeast of the SP the existing Little Texas residential use just north of Avenue C.	51.2	46.9	54.7

[1] See Exhibit 5-A for the noise level measurement locations.
[2] The long-term 24-hour measurement worksheets are included in Appendix 5.2.

The measurements presented below in Table 5-1 allows for a comparison of the before and after Project noise levels and is necessary to assess potential noise increase due to the Project's contribution to the *ambient* noise levels. This approach is necessary to calculate the temporary or permanent increase in *ambient* noise levels as required by the CEQA Guidelines Environmental Checklist. 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.

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6 TRAFFIC NOISE METHODS AND PROCEDURES

The purpose of this off-site traffic noise analysis is to evaluate the traffic noise impacts for the PAs 2, 4, 6, 7, and 8. The off-site traffic noise impacts associated with the SP and Annexation Areas will be controlled by the noise policies outlined in the City of Lancaster General Plan Safety Element. The following section outlines the methods and procedures used to estimate and analyze the Existing and Background (2031) traffic noise environment. Consistent with City of Lancaster *Noise Compatible Land Use Objectives* (see Exhibit 3-A), all transportation related noise levels are presented in terms of the 24-hour CNEL's. Unlike a simple arithmetic average noise level, CNEL represents the logarithmic summation of the equivalent hourly noise levels with evening and nighttime noise penalties recognizing that noise may have different impacts on people depending on when it occurs.

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. (19) This methodology is commonly used to describe the off-site traffic noise levels throughout southern California. The FHWA Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL) by vehicle type. REMEL represents the maximum sound level (L_{max}) of individual vehicle "pass by" events by vehicle type when measured at a "reference distance" of 50 feet from the center of the travel lane.

In California the national REMELs are substituted with the California Vehicle Noise (Calveno) Emission Levels. (20) 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. (21) This is the same methodology and approach used for the City of Lancaster General Plan EIR. (22)

6.2 OFF-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

Table 6-1 presents the roadway parameters used to assess the off-site dBA CNEL transportation noise impacts for PAs 2, 4, 6, 7, and 8. Table 6-1 identifies the 17 off-site study area roadway segments as shown on Exhibit 6-A, the distance from the centerline to adjacent land use based on the functional roadway classifications and the vehicle speeds. Roadway segments were selected for traffic noise impact analysis based on a review of the Project's passenger car and

truck trip distributions as presented in the TA. Only segments with assigned Project traffic were included in the analysis, as segments without Project traffic are not expected to experience any increase in off-site traffic noise levels.

EXHIBIT 6-A: OFF-SITE STUDY AREA ROADWAY SEGMENTS

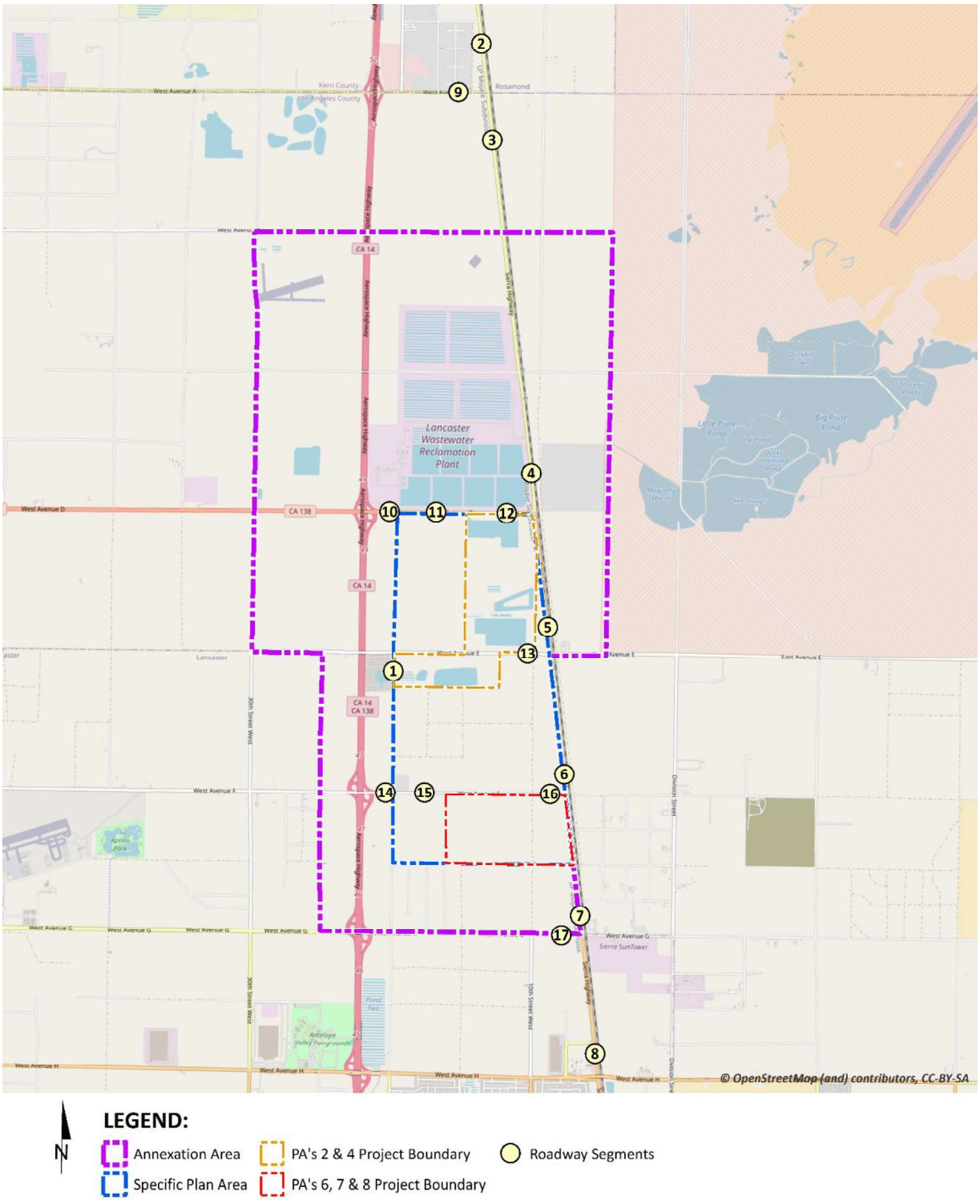

TABLE 6-1: OFF-SITE ROADWAY PARAMETERS

ID	Roadway	Segment	Roadway Type	Receiving Land Use[1]	Distance from Centerline to Receiving Land Use (Feet)[2]	Vehicle Speed (mph)
1	20th St. West	s/o Avenue E	Collector	Sensitive	32'	50
2	Sierra Hwy.	n/o Avenue A	Major	Sensitive	59'	55
3	Sierra Hwy.	s/o Avenue A	Major	Non-Sensitive	59'	55
4	Sierra Hwy.	n/o Avenue D	Major	Non-Sensitive	59'	55
5	Sierra Hwy.	n/o Avenue E	Major	Non-Sensitive	59'	55
6	Sierra Hwy.	n/o Avenue F	Major	Sensitive	59'	55
7	Sierra Hwy.	n/o Avenue G	Major	Non-Sensitive	59'	55
8	Sierra Hwy.	n/o Avenue H	Major	Non-Sensitive	59'	55
9	Avenue A	w/o Sierra Hwy.	Secondary	Sensitive	42'	55
10	Avenue D	w/o 20th St. West	Major	Non-Sensitive	59'	55
11	Avenue D	e/o 20th St. West	Major	Non-Sensitive	59'	55
12	Avenue D	w/o Sierra Hwy.	Major	Non-Sensitive	59'	55
13	Avenue E	w/o Sierra Hwy.	Secondary	Non-Sensitive	42'	55
14	Avenue F	w/o 20th St. West	Secondary	Non-Sensitive	42'	55
15	Avenue F	e/o 20th St. West	Secondary	Non-Sensitive	42'	55
16	Avenue F	w/o Sierra Hwy.	Secondary	Non-Sensitive	42'	55
17	Avenue G	w/o Sierra Hwy.	Secondary	Non-Sensitive	42'	55

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] Distance to receiving land use is based upon the right-of-way distances.

The ADT volumes used in this study area presented on Table 6-2 are based on the *Westside Annexation and North Lancaster Industrial Specific Plan Local Transportation Assessment,* (TA) prepared by Urban Crossroads, Inc. for the following traffic scenarios (23):

- Existing
- Existing with PAs 2, 4, 6, 7, and 8
- Background (2031) Background (2031) with PAs 2, 4, 6, 7, and 8

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 at the boundary of the right-of-way of the receiving adjacent land use, without and with project ADT traffic volumes from the Project Local Transportation Assessment. Consistent with the TA, the Project is anticipated to generate a net total of 21,182 two-way trips per day (actual vehicles) that includes 4,940 truck trips.

TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic Volumes[1]			
			Existing		Background (2031)	
			Without Project	With Project	Without Project	With Project
1	20th St. West	s/o Avenue E	2,282	5,344	3,299	6,362
2	Sierra Hwy.	n/o Avenue A	6,782	7,841	7,642	8,701
3	Sierra Hwy.	s/o Avenue A	7,813	9,684	8,766	10,638
4	Sierra Hwy.	n/o Avenue D	8,197	10,068	9,186	11,057
5	Sierra Hwy.	n/o Avenue E	11,409	11,990	12,791	13,373
6	Sierra Hwy.	n/o Avenue F	7,119	9,715	8,111	10,708
7	Sierra Hwy.	n/o Avenue G	7,402	10,333	9,375	12,305
8	Sierra Hwy.	n/o Avenue H	6,761	8,632	8,249	10,121
9	Avenue A	w/o Sierra Hwy.	1,346	2,158	1,468	2,280
10	Avenue D	w/o 20th St. West	3,859	11,999	4,416	12,556
11	Avenue D	e/o 20th St. West	3,349	11,489	3,859	11,999
12	Avenue D	w/o Sierra Hwy.	3,349	4,799	3,859	5,310
13	Avenue E	w/o Sierra Hwy.	202	2,217	220	2,236
14	Avenue F	w/o 20th St. West	3,586	11,826	7,157	15,397
15	Avenue F	e/o 20th St. West	1,330	6,508	2,049	7,227
16	Avenue F	w/o Sierra Hwy.	1,330	2,194	2,403	3,267
17	Avenue G	w/o Sierra Hwy.	3,218	3,218	3,562	3,562

[1] Westside Annexation and North Lancaster Industrial Specific Plan Local Transportation Assessment, Urban Crossroads, Inc.

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

Table 6-3 provides the time of day (daytime, evening, and nighttime) vehicle splits and the traffic flow by vehicle type (vehicle mix) used for all without Project traffic scenarios. Tables 6-4 to 6-5 show the with Project vehicle mix. Due to the added Project truck trips, the increase in Project traffic volumes and the distributions of trucks on the study area road segments, the percentage of autos, medium trucks and heavy trucks will vary for each of the traffic scenarios. This explains why the existing and Background (2031) traffic volumes and vehicle mixes vary between seemingly identical study area roadway segments.

TABLE 6-3: TIME OF DAY VEHICLE SPLITS

Time of Day	Vehicle Mix[1]			Time of Day Split[1]
	Autos[2]	Medium Trucks[3]	Heavy Trucks[4]	
Daytime	73.13%	1.44%	2.66%	77.23%
Evening	7.43%	0.07%	0.25%	7.75%
Nighttime	13.94%	0.35%	0.72%	15.02%
Daily	94.51%	1.86%	3.63%	100.00%

[1] Based on 11/14/2024, 24-hour directional vehicle classification count collected on West Avenue H west of Sierra Highway in the City of Lancaster (Westside Annexation and North Lancaster Industrial Specific Plan Local Transportation Assessment, Urban Crossroads, Inc.)
[2] All vehicles with two axles and four wheels designed primarily for transportation of nine or fewer passengers (automobiles) or transportation of cargo (light trucks).
[3] All vehicles with two axles and six wheels designed for transportation of cargo.
[4] All vehicles with three or more axles designed for the transportation of cargo.

TABLE 6-4: EXISTING WITH PROJECT VEHICLE MIX

ID	Roadway	Segment	With Project[1]			
			Autos	Medium Trucks	Heavy Trucks	Total[2]
1	20th St. West	s/o Avenue E	82.59%	3.73%	13.68%	100.00%
2	Sierra Hwy.	n/o Avenue A	92.10%	2.22%	5.67%	100.00%
3	Sierra Hwy.	s/o Avenue A	93.02%	2.00%	4.98%	100.00%
4	Sierra Hwy.	n/o Avenue D	93.08%	1.99%	4.93%	100.00%
5	Sierra Hwy.	n/o Avenue E	94.06%	1.91%	4.03%	100.00%
6	Sierra Hwy.	n/o Avenue F	91.78%	2.18%	6.04%	100.00%
7	Sierra Hwy.	n/o Avenue G	91.29%	2.26%	6.45%	100.00%
8	Sierra Hwy.	n/o Avenue H	92.84%	2.02%	5.14%	100.00%
9	Avenue A	w/o Sierra Hwy.	96.58%	1.16%	2.26%	100.00%
10	Avenue D	w/o 20th St. West	82.13%	3.73%	14.13%	100.00%
11	Avenue D	e/o 20th St. West	81.58%	3.82%	14.60%	100.00%
12	Avenue D	w/o Sierra Hwy.	89.46%	2.61%	7.93%	100.00%
13	Avenue E	w/o Sierra Hwy.	84.98%	3.00%	12.03%	100.00%
14	Avenue F	w/o 20th St. West	79.17%	4.30%	16.54%	100.00%
15	Avenue F	e/o 20th St. West	76.41%	4.76%	18.83%	100.00%
16	Avenue F	w/o Sierra Hwy.	91.18%	2.20%	6.62%	100.00%
17	Avenue G	w/o Sierra Hwy.	94.51%	1.86%	3.63%	100.00%

[1] Total of vehicle mix percentage values rounded to the nearest one-hundredth.

TABLE 6-5: BACKGROUND (2031) WITH PROJECT VEHICLE MIX

ID	Roadway	Segment	With Project[1]			
			Autos	Medium Trucks	Heavy Trucks	Total[2]
1	20th St. West	s/o Avenue E	84.50%	3.43%	12.07%	100.00%
2	Sierra Hwy.	n/o Avenue A	92.34%	2.19%	5.47%	100.00%
3	Sierra Hwy.	s/o Avenue A	93.16%	1.99%	4.86%	100.00%
4	Sierra Hwy.	n/o Avenue D	93.21%	1.98%	4.81%	100.00%
5	Sierra Hwy.	n/o Avenue E	94.11%	1.91%	3.99%	100.00%
6	Sierra Hwy.	n/o Avenue F	92.03%	2.15%	5.81%	100.00%
7	Sierra Hwy.	n/o Avenue G	91.80%	2.20%	6.00%	100.00%
8	Sierra Hwy.	n/o Avenue H	93.09%	1.99%	4.92%	100.00%
9	Avenue A	w/o Sierra Hwy.	96.47%	1.20%	2.33%	100.00%
10	Avenue D	w/o 20th St. West	82.68%	3.65%	13.67%	100.00%
11	Avenue D	e/o 20th St. West	82.13%	3.73%	14.13%	100.00%
12	Avenue D	w/o Sierra Hwy.	89.95%	2.53%	7.52%	100.00%
13	Avenue E	w/o Sierra Hwy.	85.06%	2.99%	11.96%	100.00%
14	Avenue F	w/o 20th St. West	82.73%	3.73%	13.54%	100.00%
15	Avenue F	e/o 20th St. West	78.21%	4.47%	17.32%	100.00%
16	Avenue F	w/o Sierra Hwy.	92.28%	2.09%	5.64%	100.00%
17	Avenue G	w/o Sierra Hwy.	94.51%	1.86%	3.63%	100.00%

[1] Total of vehicle mix percentage values rounded to the nearest one-hundredth.

7 OFF-SITE TRAFFIC NOISE ANALYSIS

By far, the largest single source of community noise is the flow of traffic on major roadways. Motor vehicle noise is generated by engine vibrations, the interaction between tires and the road, and the exhaust system. To assess the off-site transportation CNEL noise level impacts associated with the development of the proposed Project, noise contours were developed based on the *Westside Annexation and North Lancaster Industrial Specific Plan Local Transportation Assessment,* prepared by Urban Crossroads, Inc. (23)

7.1 TRAFFIC NOISE CONTOURS

Noise contour boundaries represent equal levels of noise exposure and are measured in CNEL from the center of the roadway. 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.

7.1.1 ANNEXATION AREA

A larger area will be annexed into the City of Lancaster (currently within Los Angeles County) which encompasses 7,153 acres of which 1,860.7 acres is associated with the SP. There are six land use areas proposed within the Annexation Area: non-urban residential uses, multifamily residential (mobile home), mixed use (residential with retail, office, or service uses), light industrial, public uses, and the proposed SP. According to the *Westside Annexation and North Lancaster Industrial Specific Plan Local Transportation Assessment* the Annexation Area will generate a total of 163,472 two-way trips per day. The annexation area is currently located within unincorporated Los Angeles County and the off-site traffic noise level impacts were previously evaluated in the Los Angeles County General Plan Update Draft EIR (24). The Draft EIR determined that Buildout of the General Plan including the annexation area would result in an increase in traffic on local roadways, which would substantially increase the existing ambient noise environment.

7.1.2 NORTH LANCASTER INDUSTRIAL SPECIFIC PLAN

The SP encompasses approximately 1,860.7 acres. Note that the approved Antelope Valley Logistics Center West Site is located within the western half of PA 6 of the SP which includes the development of two 1,007,536 square foot High-Cube Transload & Short-Term Storage Warehouse buildings for a total of 2,015,072 square feet. The western half of PA 6 has been previously entitled and its impacts analyzed in a previously approved CEQA document. In addition, the western half of PA 6 has been included as part of the cumulative background conditions that are reflected in the off-site traffic noise analysis.

According to the *Westside Annexation and North Lancaster Industrial Specific Plan Local Transportation Assessment*, the land use mix for the SP includes 40% Industrial Park, 25% Warehousing, 25% High-Cube Parcel Hub Warehouse, and 10% High-Cube Cold Storage Warehouse uses for PAs 1, 3, and 5.

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. 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 for each traffic condition. Appendix 7.1 includes a summary of the dBA CNEL traffic noise level contour worksheets for each of the traffic conditions.

TABLE 7-1: EXISTING WITHOUT PROJECT CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	20th St. West	s/o Avenue E	Sensitive	67.5	RW	47	101
2	Sierra Hwy.	n/o Avenue A	Sensitive	69.9	RW	125	269
3	Sierra Hwy.	s/o Avenue A	Non-Sensitive	70.5	64	137	296
4	Sierra Hwy.	n/o Avenue D	Non-Sensitive	70.7	66	142	306
5	Sierra Hwy.	n/o Avenue E	Non-Sensitive	72.2	82	177	381
6	Sierra Hwy.	n/o Avenue F	Sensitive	70.1	60	129	278
7	Sierra Hwy.	n/o Avenue G	Non-Sensitive	70.3	62	133	286
8	Sierra Hwy.	n/o Avenue H	Non-Sensitive	69.9	RW	125	269
9	Avenue A	w/o Sierra Hwy.	Sensitive	64.8	RW	RW	88
10	Avenue D	w/o 20th St. West	Non-Sensitive	67.4	RW	86	185
11	Avenue D	e/o 20th St. West	Non-Sensitive	66.8	RW	78	168
12	Avenue D	w/o Sierra Hwy.	Non-Sensitive	66.8	RW	78	168
13	Avenue E	w/o Sierra Hwy.	Non-Sensitive	56.6	RW	RW	RW
14	Avenue F	w/o 20th St. West	Non-Sensitive	69.1	RW	79	169
15	Avenue F	e/o 20th St. West	Non-Sensitive	64.8	RW	RW	87
16	Avenue F	w/o Sierra Hwy.	Non-Sensitive	64.8	RW	RW	87
17	Avenue G	w/o Sierra Hwy.	Non-Sensitive	68.6	RW	73	158

[1] Based on a review of existing aerial imagery. Noise sensitive uses are limited to existing residential land uses.
[2] The CNEL is calculated at the boundary of the right-of-way of the receiving adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-2: EXISTING WITH PROJECT CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	20th St. West	s/o Avenue E	Sensitive	75.3	72	154	333
2	Sierra Hwy.	n/o Avenue A	Sensitive	71.7	76	164	353
3	Sierra Hwy.	s/o Avenue A	Non-Sensitive	72.2	83	178	384
4	Sierra Hwy.	n/o Avenue D	Non-Sensitive	72.3	85	182	392
5	Sierra Hwy.	n/o Avenue E	Non-Sensitive	72.6	88	190	409
6	Sierra Hwy.	n/o Avenue F	Sensitive	72.7	90	194	417
7	Sierra Hwy.	n/o Avenue G	Non-Sensitive	73.2	96	208	448
8	Sierra Hwy.	n/o Avenue H	Non-Sensitive	71.8	78	167	360
9	Avenue A	w/o Sierra Hwy.	Sensitive	65.8	RW	47	102
10	Avenue D	w/o 20th St. West	Non-Sensitive	76.4	158	340	732
11	Avenue D	e/o 20th St. West	Non-Sensitive	76.3	156	336	723
12	Avenue D	w/o Sierra Hwy.	Non-Sensitive	70.5	64	137	296
13	Avenue E	w/o Sierra Hwy.	Non-Sensitive	70.4	45	97	208
14	Avenue F	w/o 20th St. West	Non-Sensitive	78.9	164	353	761
15	Avenue F	e/o 20th St. West	Non-Sensitive	76.8	119	255	550
16	Avenue F	w/o Sierra Hwy.	Non-Sensitive	68.5	RW	72	155
17	Avenue G	w/o Sierra Hwy.	Non-Sensitive	68.6	RW	73	158

[1] Based on a review of existing aerial imagery. Noise sensitive uses are limited to existing residential land uses.
[2] The CNEL is calculated at the boundary of the right-of-way of the receiving adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-3: BACKGROUND (2031) WITHOUT PROJECT CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	20th St. West	s/o Avenue E	Sensitive	69.1	RW	60	129
2	Sierra Hwy.	n/o Avenue A	Sensitive	70.4	63	135	292
3	Sierra Hwy.	s/o Avenue A	Non-Sensitive	71.0	69	148	320
4	Sierra Hwy.	n/o Avenue D	Non-Sensitive	71.2	71	153	330
5	Sierra Hwy.	n/o Avenue E	Non-Sensitive	72.6	89	191	411
6	Sierra Hwy.	n/o Avenue F	Sensitive	70.7	65	141	304
7	Sierra Hwy.	n/o Avenue G	Non-Sensitive	71.3	72	155	334
8	Sierra Hwy.	n/o Avenue H	Non-Sensitive	70.7	66	142	307
9	Avenue A	w/o Sierra Hwy.	Sensitive	65.2	RW	43	93
10	Avenue D	w/o 20th St. West	Non-Sensitive	68.0	RW	94	202
11	Avenue D	e/o 20th St. West	Non-Sensitive	67.4	RW	86	185
12	Avenue D	w/o Sierra Hwy.	Non-Sensitive	67.4	RW	86	185
13	Avenue E	w/o Sierra Hwy.	Non-Sensitive	57.0	RW	RW	RW
14	Avenue F	w/o 20th St. West	Non-Sensitive	72.1	58	125	269
15	Avenue F	e/o 20th St. West	Non-Sensitive	66.7	RW	54	117
16	Avenue F	w/o Sierra Hwy.	Non-Sensitive	67.3	RW	60	130
17	Avenue G	w/o Sierra Hwy.	Non-Sensitive	69.1	RW	78	169

[1] Based on a review of existing aerial imagery. Noise sensitive uses are limited to existing residential land uses.
[2] The CNEL is calculated at the boundary of the right-of-way of the receiving adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-4: BACKGROUND (2031) WITH PROJECT CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	20th St. West	s/o Avenue E	Sensitive	75.6	75	162	349
2	Sierra Hwy.	n/o Avenue A	Sensitive	72.0	80	173	373
3	Sierra Hwy.	s/o Avenue A	Non-Sensitive	72.5	87	188	405
4	Sierra Hwy.	n/o Avenue D	Non-Sensitive	72.7	89	192	414
5	Sierra Hwy.	n/o Avenue E	Non-Sensitive	73.1	94	203	438
6	Sierra Hwy.	n/o Avenue F	Sensitive	73.1	94	203	438
7	Sierra Hwy.	n/o Avenue G	Non-Sensitive	73.8	105	226	487
8	Sierra Hwy.	n/o Avenue H	Non-Sensitive	72.4	85	183	394
9	Avenue A	w/o Sierra Hwy.	Sensitive	66.1	RW	50	107
10	Avenue D	w/o 20th St. West	Non-Sensitive	76.5	160	344	740
11	Avenue D	e/o 20th St. West	Non-Sensitive	76.4	158	340	732
12	Avenue D	w/o Sierra Hwy.	Non-Sensitive	70.8	66	143	309
13	Avenue E	w/o Sierra Hwy.	Non-Sensitive	70.5	45	97	209
14	Avenue F	w/o 20th St. West	Non-Sensitive	79.3	175	378	813
15	Avenue F	e/o 20th St. West	Non-Sensitive	76.9	121	261	563
16	Avenue F	w/o Sierra Hwy.	Non-Sensitive	69.8	RW	87	188
17	Avenue G	w/o Sierra Hwy.	Non-Sensitive	69.1	RW	78	169

[1] Based on a review of existing aerial imagery. Noise sensitive uses are limited to existing residential land uses.
[2] The CNEL is calculated at the boundary of the right-of-way of the receiving adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

7.2 EXISTING 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 the traffic 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 is expected to range from 56.6 to 72.2 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 65.8 to 78.9 dBA CNEL. Table 7-5 shows that the Project off-site traffic noise level impacts will range from 0.4 to 13.8 dBA CNEL.

Based on the significance criteria for off-site traffic noise presented in Table 4-1, 14 of the study area roadway segments are shown to experience *potentially significant* off-site traffic noise increases due to the Existing with Project Buildout conditions. For an off-site traffic noise level impact to be considered significant, receivers need to perceive an increase of traffic noise levels over time and the off-site traffic impacts are generally limited to noise sensitive residential

receivers that are likely to perceive this increase. Section 7.4 describes the off-site traffic noise mitigation measures considered in this analysis.

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

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[1]			Incremental Noise Level Increase Threshold[2]	
				No Project	With Project	Project Addition	Limit	Exceeded?
1	20th St. West	s/o Avenue E	Sensitive	67.5	75.3	7.8	1.5	**Yes**
2	Sierra Hwy.	n/o Avenue A	Sensitive	69.9	71.7	1.8	1.5	**Yes**
3	Sierra Hwy.	s/o Avenue A	Non-Sensitive	70.5	72.2	1.7	1.5	**Yes**
4	Sierra Hwy.	n/o Avenue D	Non-Sensitive	70.7	72.3	1.6	1.5	**Yes**
5	Sierra Hwy.	n/o Avenue E	Non-Sensitive	72.2	72.6	0.4	1.5	No
6	Sierra Hwy.	n/o Avenue F	Sensitive	70.1	72.7	2.6	1.5	**Yes**
7	Sierra Hwy.	n/o Avenue G	Non-Sensitive	70.3	73.2	2.9	1.5	**Yes**
8	Sierra Hwy.	n/o Avenue H	Non-Sensitive	69.9	71.8	1.9	1.5	**Yes**
9	Avenue A	w/o Sierra Hwy.	Sensitive	64.8	65.8	1.0	3.0	No
10	Avenue D	w/o 20th St. West	Non-Sensitive	67.4	76.4	9.0	1.5	**Yes**
11	Avenue D	e/o 20th St. West	Non-Sensitive	66.8	76.3	9.5	1.5	**Yes**
12	Avenue D	w/o Sierra Hwy.	Non-Sensitive	66.8	70.5	3.7	1.5	**Yes**
13	Avenue E	w/o Sierra Hwy.	Non-Sensitive	56.6	70.4	13.8	5.0	**Yes**
14	Avenue F	w/o 20th St. West	Non-Sensitive	69.1	78.9	9.8	1.5	**Yes**
15	Avenue F	e/o 20th St. West	Non-Sensitive	64.8	76.8	12.0	3.0	**Yes**
16	Avenue F	w/o Sierra Hwy.	Non-Sensitive	64.8	68.5	3.7	3.0	**Yes**
17	Avenue G	w/o Sierra Hwy.	Non-Sensitive	68.6	68.6	0.0	0.0	No

[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 4-1)?

7.3 BACKGROUND (2031) PROJECT TRAFFIC NOISE LEVEL INCREASES

Table 7-3 presents the Background (2031) without Project conditions CNEL noise levels. The Background (2031) without Project exterior noise levels is expected to range from 57.0 to 72.6 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-4 shows the Background (2031) with Project conditions will range from 66.1 to 79.3 dBA CNEL. Table 7-6 shows that the Project off-site traffic noise level increases will range from 0.5 to 13.5 dBA CNEL. Based on the significance criteria for off-site traffic noise presented in Table 4-1, 12 of the study area roadway segments are shown to experience *potentially significant* off-site traffic noise increases due to the Existing with Project Buildout conditions.

TABLE 7-6: BACKGROUND (2031) WITH PROJECT TRAFFIC NOISE INCREASES

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[1]			Incremental Noise Level Increase Threshold[2]	
				No Project	With Project	Project Addition	Limit	Exceeded?
1	20th St. West	s/o Avenue E	Sensitive	69.1	75.6	6.5	1.5	**Yes**
2	Sierra Hwy.	n/o Avenue A	Sensitive	70.4	72.0	1.6	1.5	**Yes**
3	Sierra Hwy.	s/o Avenue A	Non-Sensitive	71.0	72.5	1.5	1.5	No
4	Sierra Hwy.	n/o Avenue D	Non-Sensitive	71.2	72.7	1.5	1.5	No
5	Sierra Hwy.	n/o Avenue E	Non-Sensitive	72.6	73.1	0.5	1.5	No
6	Sierra Hwy.	n/o Avenue F	Sensitive	70.7	73.1	2.4	1.5	**Yes**
7	Sierra Hwy.	n/o Avenue G	Non-Sensitive	71.3	73.8	2.5	1.5	**Yes**
8	Sierra Hwy.	n/o Avenue H	Non-Sensitive	70.7	72.4	1.7	1.5	**Yes**
9	Avenue A	w/o Sierra Hwy.	Sensitive	65.2	66.1	0.9	1.5	No
10	Avenue D	w/o 20th St. West	Non-Sensitive	68.0	76.5	8.5	1.5	**Yes**
11	Avenue D	e/o 20th St. West	Non-Sensitive	67.4	76.4	9.0	1.5	**Yes**
12	Avenue D	w/o Sierra Hwy.	Non-Sensitive	67.4	70.8	3.4	1.5	**Yes**
13	Avenue E	w/o Sierra Hwy.	Non-Sensitive	57.0	70.5	13.5	5.0	**Yes**
14	Avenue F	w/o 20th St. West	Non-Sensitive	72.1	79.3	7.2	1.5	**Yes**
15	Avenue F	e/o 20th St. West	Non-Sensitive	66.7	76.9	10.2	1.5	**Yes**
16	Avenue F	w/o Sierra Hwy.	Non-Sensitive	67.3	69.8	2.5	1.5	**Yes**
17	Avenue G	w/o Sierra Hwy.	Non-Sensitive	69.1	69.1	0.0	1.5	No

[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 4-1)?

7.4 OFF-SITE TRAFFIC NOISE MITIGATION

Under CEQA, when a project has a *potentially significant* impact, mitigation measures must be considered to reduce or eliminate the harm whenever feasible. This ensures informed decision-making, protects the environment, and helps projects comply with legal requirements to minimize adverse effects. The off-site Traffic Noise Analysis shows that Project traffic noise increases on 14 study area roadway segments will exceed the incremental noise level increase thresholds shown on Table 4-1. To reduce the *potentially significant* Project traffic noise increases on the impacted study area roadway segments, potential noise mitigation measures were considered in this analysis. Potential mitigation measures discussed below include rubberized asphalt hot mix pavement and off-site noise barriers for the existing noise sensitive residential land uses adjacent to impacted roadway segments.

7.4.1 RUBBERIZED ASPHALT

The FHWA Traffic Noise Prediction Model (FHWA-RD-77-108) used for the off-site traffic noise analysis, assumes a standard dense-graded asphalt pavement as the default pavement type. This

model does not account for variations in pavement type, texture, or surface characteristics, which can influence noise levels. Therefore, due to the potential noise attenuation benefits, rubberized asphalt is considered as a mitigation measure for the off-site Project-related traffic noise increases. In addition, according to the Director of Public Works, rubberized asphalt is the City's standard pavement type for all roadways.

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. (8) 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 (8) and(18) the Canadian Ministry of Transportation and Highways (8) 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 reduced by rubberized pavement. This is due to the height of the truck engine exhaust stack above the pavement. (8) Per Caltrans guidance a truck stack height is modeled using a height of 11.5 feet above the road. (4) (25) Based on California Vehicle Noise (Calveno) Reference Energy Mean Emission Levels (REMELs), one heavy truck traveling at 55 mph generates as much noise as approximately 13 autos at the same speed. (17 p. 3_20) This is due to a combination of factors including the difference between the noise source height for heavy trucks of 11.5 feet versus autos with a noise source height of less than 2 feet. With the primary off-site traffic noise source for this Project consisting of heavy trucks with a stack height of 11.5 feet off the ground, the tire/pavement noise reduction benefits associated with 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.* Nevertheless, rubberize asphalt is the City standard for all roadways and any new roadway construction within the annexation area will be required to utilize rubberized asphalt.

7.4.2 OFF-SITE NOISE BARRIERS

While noise barriers are commonly used to reduce the potential traffic noise levels from nearby transportation noise source activities, they are typically developed in coordination with new

noise sensitive residential development or as part of a roadway widening project. Even though off-site noise barriers are typically not developed by individual off-site projects that contribute to the cumulative off-site traffic noise levels, off-site noise barriers were considered in this analysis as a potential traffic noise mitigation measure to reduce the Project-related 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) 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. (25) As a result, any external noise barriers at noise-sensitive land uses affected by Project-related traffic noise increases would need to be sufficiently tall and long to obstruct the line-of-sight between the noise source (11.5 feet high, per Caltrans) and the receiver (5 feet high, per FHWA guidance) to achieve a 5 dBA noise reduction, as recommended by FHWA guidance.

Consequently, off-site noise barriers are not considered feasible, as they would not reduce off-site traffic noise levels to below a level of significance. While the construction of a 12-foot-high noise barriers could conceivably reduce the absolute exterior noise levels, it will not change the fact that the source traffic noise levels will increase due to the added Project traffic volumes. In addition, any noise barriers would block views and result in aesthetic and visual impacts affecting passersby that would off-set any noise attenuation benefits that may result from such walls. Lastly, many of the needed off-site walls are on property owned or controlled by others. 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 increases shown on Tables 7-5 and 7-6. Therefore, the Project-related off-site traffic noise increases at adjacent noise-sensitive land uses are considered a *significant and unavoidable* impact.

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8 RECEIVER LOCATIONS

To assess the potential for long-term operational and short-term construction noise impacts, the following receiver locations, as shown on Exhibit 8-A, were identified as representative locations for analysis. 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. 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, six receiver locations were identified. 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.

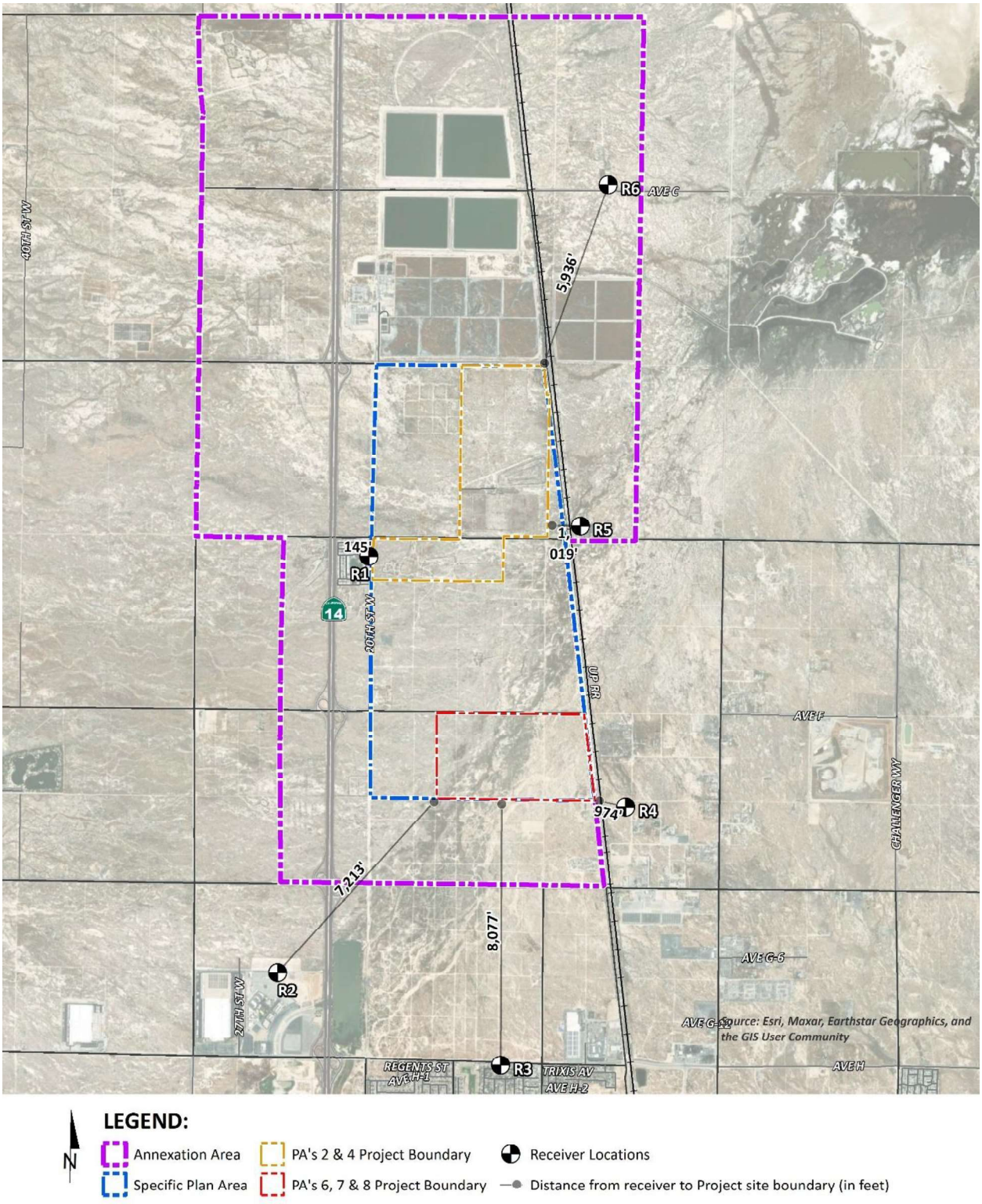
R1: Location R1 represents the existing Leisure Lake Mobile Estates, approximately 145 feet west of the SP. Receiver R1 is placed at 48303 20th Street W Lot 208 in the private outdoor living area (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L1, to describe the existing ambient noise environment.

R2: Location R2 represents the Antelope Valley Fair and Event Center RV Park at 2551 Avenue G8, approximately 7,213 feet southwest of the SP. R2 is placed in the nearest RV parking space facing the SP. A 24-hour noise measurement was taken near this location, L2, to describe the existing ambient noise environment.

R3: Location R3 represents the existing single-family residence at 1145 Regents Street, approximately 8,077 feet south of the SP. Receiver R3 is placed in the private outdoor living area (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L3, to describe the existing ambient noise environment.

R4: Location R4 represents the existing residence at 47149 5th Street W, approximately 974 feet east of the Project site. Receiver R4 is placed in the private outdoor living area (backyard) facing the Project site. While noise measurement location L4 represents the nearest noise measurement, the ambient noise conditions at Receiver R4 are likely better represented by noise measurement location L5 due to its proximity to Sierra Highway and the Union Pacific Railroad. However, a review the ambient noise level measurements shows that the ambient noise levels at measurement location L4 are lower and therefore, will conservatively overstate the potential Project noise level contributions and impacts. Therefore, the nearest 24-hour noise measurement at location L4 is used to describe the existing ambient noise environment.

EXHIBIT 8-A: RECEIVER LOCATIONS



R5: Location R5 represents Mitchell's Avenue E RV Park at 721 W Avenue E, approximately 1,015 feet east of the SP. Receiver R5 is placed at the nearest RV Camp Site facing the SP. A 24-hour noise measurement was taken near this location, L5, to describe the existing ambient noise environment.

R6: Location R6 represents the existing Little Texas residential use just north of Avenue C, approximately 5,936 feet northeast of the SP. Receiver R6 is placed in the private outdoor living area (backyard) facing the SP. A 24-hour noise measurement was taken near this location, L6, to describe the existing ambient noise environment.

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9 OPERATIONAL NOISE ANALYSIS

This section analyzes the potential stationary-source operational noise impacts at the nearby receiver locations, identified in Section 8. This operational noise analysis focuses on the operational noise source activity from PAs 2, 4, 6, 7, and 8 since the noise source activities associated with the Annexation Area and SP are speculative and not known at this time. All noise sources activities associated with the Annexation and SP are still controlled by the policies outlined in the City of Lancaster General Plan Safety Element and the applicable noise standards presented in Section 3.

9.1 OPERATIONAL NOISE SOURCES

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: cold storage loading dock activity, tractor trailer storage activity, roof-top air conditioning units, parking lot vehicle movements, trash enclosure activity, and truck movements. To conservatively describe the future noise environment, Exhibits 9-A and 9-B present the 404 individual noise sources used to assess the operational noise levels. To reduce the noise exposure to the existing noise sensitive areas near the Project site including the Leisure Lakes Mobile Estates located west of the SP, several design features were considered as part of the site planning process. These design features include positioning the loading dock areas in an east-west orientation and increasing building setback by placing a large parking lot between the loading docks and the existing residential areas to the west.

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 all noise source activity all operating at the same time. 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. (18)

EXHIBIT 9-A: PAS 2 & 4 OPERATIONAL NOISE SOURCE LOCATIONS

EXHIBIT 9-B: PAS 6, 7 & 8 OPERATIONAL NOISE SOURCE LOCATIONS

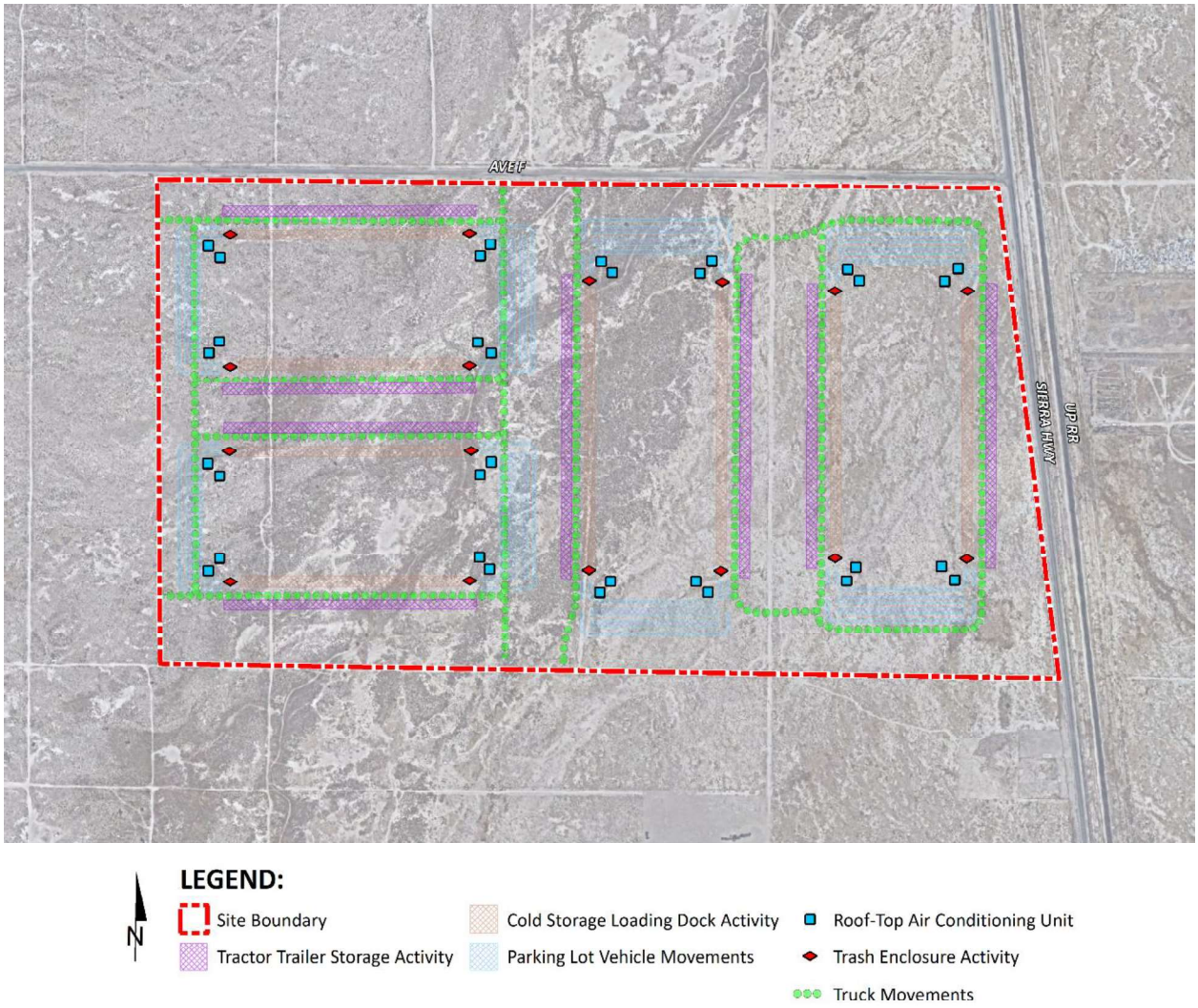


TABLE 9-1: REFERENCE NOISE LEVEL MEASUREMENTS

Reference Noise Source	Noise Source Height (Feet)	Min./ Hour[1]		Reference Noise Level (dBA L_{eq}) @ 50 Feet	Sound Power Level (dBA)[2]
		Day	Night		
Cold Storage Loading Dock Activity	8'	60	60	65.7	111.5
Tractor Trailer Storage Activity	8'	60	60	62.8	103.4
Roof-Top Air Conditioning Units	5'	39	28	57.2	88.9
Parking Lot Vehicle Movements	5'	60	60	52.6	81.1
Trash Enclosure Activity	5'	60	30	57.3	89.0
Truck Movements	8'	60	60	59.8	93.2

[1] 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.

[2] 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 COLD STORAGE LOADING DOCK ACTIVITY

The reference cold storage loading dock activities are intended to describe the typical outdoor operational noise activities associated with the Project. This includes truck idling, reefer activity (refrigerator truck/cold storage), deliveries, backup alarms, trailer docking including a combination of tractor trailer semi-trucks, two-axle delivery trucks, and background operation activities. Since the noise levels generated by cold storage loading dock activity can be higher due to the use of refrigerated trucks or reefers, this reference noise level conservatively assumes that all loading dock activity is associated with cold storage facilities. (23) The 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.

9.2.3 TRACTOR TRAILER STORAGE ACTIVITY

To evaluate the noise levels associated with truck idling, backup alarms, trailer movements and storage activities, Urban Crossroads collected a reference noise level measurement at an existing parcel hub facility to describe the potential operational noise levels associated with Project tractor trailer storage activities. The measured reference noise level at 50 feet from activity was measured at 62.8 dBA L_{eq}. The reference noise level measurement includes a semi-truck with trailer pass-by event, background switcher cab trailer towing, drop-off, idling, and backup alarm events. Tractor trailer activity is estimated during all the daytime, evening, and nighttime hours.

9.2.4 ROOF-TOP AIR CONDITIONING UNITS

The noise level measurements describe a single mechanical roof-top air conditioning unit. The reference noise level represents a Lennox SCA120 series 10-ton model packaged air conditioning unit. At the uniform reference distance of 50 feet, the reference noise level is 59.2 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 and average 39 minutes per hour during the daytime hours, and 28 minutes per hour during the nighttime hours. These operating conditions reflect peak summer cooling requirements with measured temperatures approaching 96 degrees Fahrenheit (°F) with average daytime temperatures of 82°F. For this noise analysis, the air conditioning units are expected to be located on the roof of the Project buildings.

9.2.5 PARKING LOT VEHICLE MOVEMENTS

To describe the on-site parking lot activity, a long-term reference noise level measurement was collected in the center of activity within the staff parking lot of a warehouse distribution center. At 50 feet from the center of activity, the parking lot produced a reference noise level of 56.1 dBA L_{eq}. Parking activities are expected to take place during the full hour (60 minutes) throughout the daytime and evening hours. The parking lot noise levels are mainly due to cars pulling in and out of parking spaces in combination with car doors opening and closing.

9.2.6 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 59.3 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.

9.2.7 TRUCK MOVEMENTS

The truck movements reference noise level measurement was collected over a period of 1 hour and 28 minutes and represent multiple heavy trucks entering and exiting the outdoor loading dock area producing a reference noise level of 59.8 dBA L_{eq} at 50 feet. The noise sources included at this measurement location account for trucks entering and existing the Project driveways and maneuvering in and out of the outdoor loading dock activity area.

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 9613-2 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 9613-2 protocol, the CadnaA noise prediction model relies on the reference sound power level (L_w) 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 (L_w) are connected to the sound source and are independent of distance. Sound pressure levels vary substantially with distance from the source and diminish because of 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. Appendix 9.1 includes the detailed noise dBA L_{eq} model inputs used to estimate the Project operational noise levels presented in this section.

9.4 PROJECT OPERATIONAL NOISE LEVELS

Using the reference noise levels to represent the Project operations that include cold storage loading dock activity, tractor trailer storage activity, roof-top air conditioning units, parking lot vehicle movements, trash enclosure activity, and truck movements, Urban Crossroads, Inc. calculated the operational source noise levels that are expected to be generated at the Project site and the Project-related noise level increases that would be experienced at each of the sensitive receiver locations. Table 9-2 shows that the Project operational noise levels are expected to range from 37.3 to 55.4 dBA CNEL.

TABLE 9-2: PROJECT OPERATIONAL NOISE LEVELS

Noise Source[1]	Operational Noise Levels by Receiver Location (CNEL)					
	R1	R2	R3	R4	R5	R6
Cold Storage Loading Dock Activity	46.4	36.2	38.7	51.1	54.5	40.7
Tractor Trailer Storage Activity	40.4	29.7	31.7	43.7	47.2	33.7
Roof-Top Air Conditioning Units	39.0	18.5	18.3	31.3	34.4	21.1
Parking Lot Vehicle Movements	40.3	16.1	17.1	30.5	33.1	18.8
Trash Enclosure Activity	22.8	13.2	14.1	27.9	30.6	16.2
Truck Movements	33.0	21.4	21.5	32.6	35.4	22.3
Total (All Noise Sources)	**48.8**	**37.3**	**39.6**	**52.0**	**55.4**	**41.6**

[1] See Exhibit 9-A for the noise source locations. CadnaA noise model calculations are included in Appendix 9.1.

9.5 PROJECT OPERATIONAL NOISE LEVEL COMPLIANCE

To demonstrate compliance with local noise regulations, the Project-only operational noise levels are evaluated against the City of Lancaster 24-hour CNEL exterior noise level thresholds outlined in the City of Lancaster General Plan Safety Element, Table 4-3 (see Exhibit 3-A) at the nearest noise-sensitive receiver locations. Table 9-3 shows the operational noise levels associated with the Project will not exceed the City of Lancaster exterior noise level standards. Therefore, the operational noise impacts are considered *less than significant* at the nearby noise-sensitive receiver locations.

TABLE 9-3: OPERATIONAL NOISE LEVEL COMPLIANCE

Receiver Location[1]	Measurement Location	Project Operational Noise Levels (CNEL)[2]	Noise Level Standards (CNEL)[3]	Noise Level Standards Exceeded?[4]
R1	L1	48.8	65	No
R2	L2	37.3	65	No
R3	L3	39.6	65	No
R4	L4	52.0	65	No
R5	L5	55.4	65	No
R6	L6	41.6	65	No

[1] See Exhibit 8-A for the sensitive receiver locations.
[2] Proposed Project operational noise level calculations are included in Appendix 9-1.
[3] City of Lancaster General Plan Safety Element, Table 4-3 (see Exhibit 3-A).
[4] Do the estimated Project operational noise source activities exceed the noise level standards?

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 nearby receiver locations that may be 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. The difference between the combined Project and ambient noise levels describes the Project noise level increases to the existing ambient noise environment. Noise levels that would be experienced at receiver locations when Project-source noise is added to the 24-hour ambient conditions are presented on Table 9-4 respectively. As indicated on Table 9-4, the Project will generate an operational noise increases ranging from 0.0 to 1.3 dBA CNEL at the nearest receiver locations. Project-related operational noise level increases would not exceed the operational noise level increase significance criteria

presented in Table 4-1. Therefore, Project related operational noise level increases at the sensitive receiver locations will be *less than significant.*

TABLE 9-5: 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]	Increase Criteria[7]	Increase Criteria Exceeded?
R1	48.8	L1	57.9	58.4	0.5	5.0	No
R2	37.3	L2	65.6	65.6	0.0	1.5	No
R3	39.6	L3	73.8	73.8	0.0	1.5	No
R4	52.0	L4	56.5	57.8	1.3	5.0	No
R5	55.4	L5	70.6	70.7	0.1	1.5	No
R6	41.6	L6	54.7	54.9	0.2	5.0	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 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 4-1.

10 CONSTRUCTION IMPACTS

This section analyzes potential impacts resulting from the short-term construction activities associated with the development of the Project. Exhibit 10-A shows the construction noise source locations in relation to the nearest sensitive receiver locations previously described in Section 8. As outlined in Section 3.4, LMC Section 8.24.040 requires that the Project's construction activity be limited to the permitted hours of 7:00 a.m. to 8:00 p.m. on any day with no activity allowed on Sundays.

In addition, since neither the City of Lancaster General Plan or Municipal Code establish numeric maximum acceptable construction source noise levels at potentially affected receivers for CEQA analysis purposes, 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. The FTA considers a daytime exterior construction noise level of 80 dBA L_{eq} as a reasonable threshold for noise sensitive residential land use with a nighttime exterior construction noise level of 70 dBA $L_{eq.}$ (8 p. 179)

10.1 CONSTRUCTION NOISE LEVELS

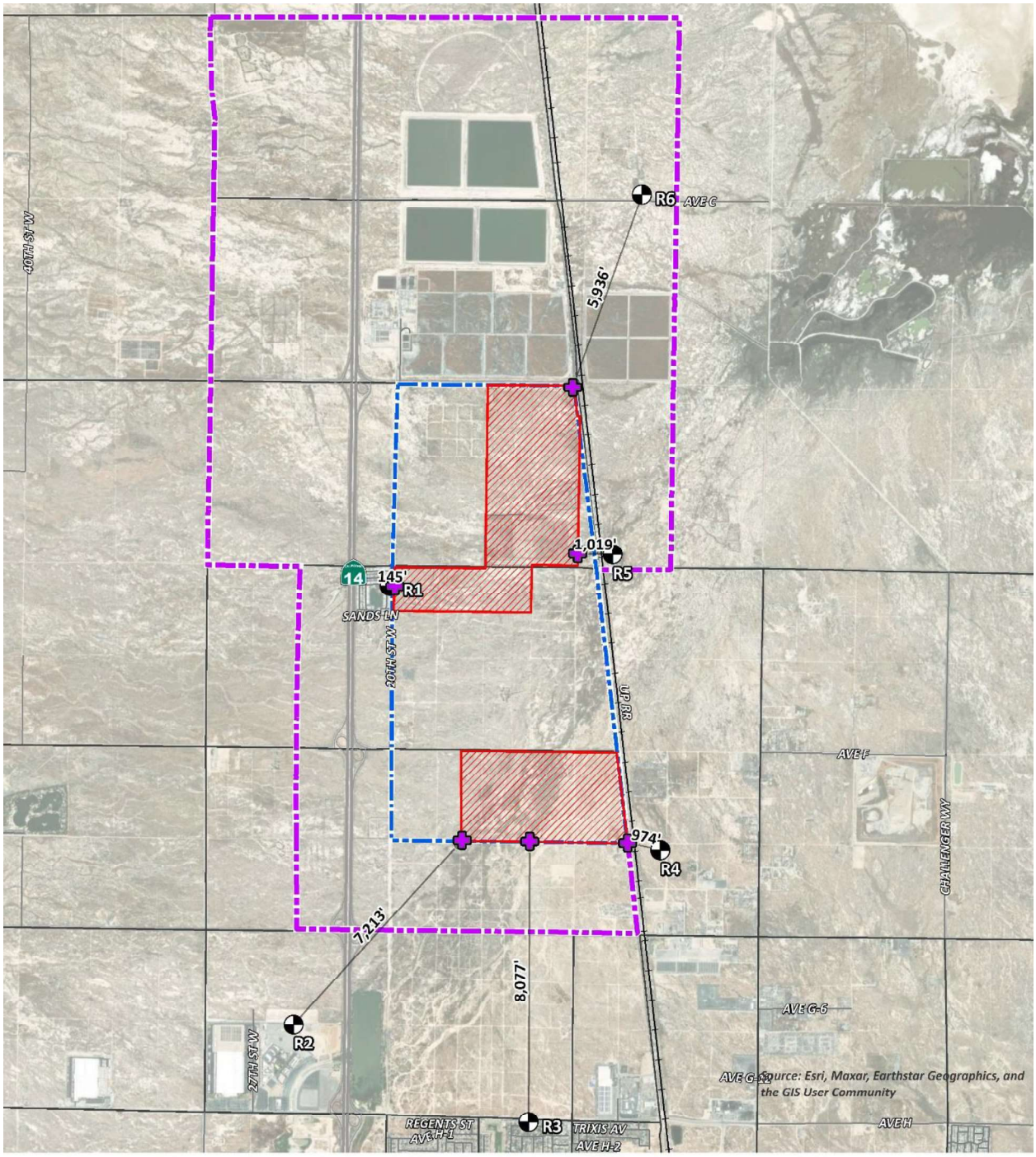
The FTA *Transit Noise and Vibration Impact Assessment Manual* recognizes that construction projects are accomplished in several different stages and outlines the procedures for assessing noise impacts during construction. Each stage has a specific equipment mix, depending on the work to be completed during that stage. As a result of the equipment mix, each stage has its own noise characteristics; some stages have higher continuous noise levels than others, and some have higher impact noise levels than others. The Project construction activities are expected to occur in the following stages:

- Demolition
- Site Preparation
- Grading
- Building Construction
- Paving
- Architectural Coating

10.2 CONSTRUCTION REFERENCE NOISE LEVELS

To describe construction noise activities, this construction noise analysis was prepared using reference construction equipment noise levels from the Federal Highway Administration (FHWA) published the Roadway Construction Noise Model (RCNM), which includes a national database of construction equipment reference noise emission levels. (26) The RCNM equipment database, provides a comprehensive list of the noise generating characteristics for specific types of construction equipment. In addition, the database provides an acoustical usage factor to estimate the fraction of time each piece of construction equipment is operating at full power (i.e., its loudest condition) during a construction operation.

EXHIBIT 10-A: CONSTRUCTION NOISE SOURCE LOCATIONS



10.3 CONSTRUCTION NOISE ANALYSIS

Using the reference construction equipment noise levels and the CadnaA noise prediction model, calculations of the typical $L_{eq(8hr)}$ and the peak hour equipment $L_{eq(1hr)}$ Project construction noise levels at the nearby receiver locations were completed. Consistent with FTA guidance for general construction noise assessment, Table 10-1 presents the combined noise levels for the nosiest pieces of construction equipment expected to be used in each phase, assuming all equipment operates at the same time.

TABLE 10-1: CONSTRUCTION REFERENCE NOISE LEVELS

Construction Stage	Reference Construction Equipmnet[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})	Composite Reference Noise Level (dBA L_{eq})[2]	Reference Power Level (dBA L_w)[3]
Demolition	Concrete Saw	83	86.8	118.4
	Grapple (on backhoe)	83		
	Gradall	79		
Site Preparation	Tractor	80	84.0	115.6
	Backhoe	74		
	Grader	81		
Grading	Scraper	80	83.3	114.9
	Excavator	77		
	Dozer	78		
Building Construction	Crane	73	80.6	112.2
	Generator	78		
	Front End Loader	75		
Paving	Paver	74	77.8	109.5
	Dump Truck	72		
	Roller	73		
Architectural Coating	Man Lift	68	76.2	107.8
	Compressor (air)	74		
	Generator (<25kVA)	70		

[1] FHWA Road Construction Noise Model.
[2] Represents the combined noise level for all equipment assuming they operate at the same time.
[3] The total amount of acoustical energy produced by a sound source independent of distance or surroundings.

10.3.1 TYPICAL CONSTRUCTION NOISE LEVELS

To account for the dynamic nature of typical construction activities, the CadnaA construction noise analysis evaluates the equipment as multiple moving point sources or work crews using an area source method within the overall construction area. Construction projects involve various stages, and activities frequently shift from one location to another. For example, during the initial stages, noise-generating activities might concentrate in one area, and then move to another section as construction progresses. As shown in Table 10-2, the highest typical construction noise levels for all construction stages are expected to range from 28.9 to 58.3 dBA $L_{eq(8hr)}$ at the nearby receiver locations. Appendix 10.1 includes the typical construction noise model calculations.

TABLE 10-2: TYPICAL CONSTRUCTION EQUIPMENT SUMMARY

Receiver Location[1]	Typical Construction Noise Levels (dBA $L_{eq(8hr)}$)						
	Demolition	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Highest Levels[2]
R1	58.3	55.5	54.8	52.1	49.4	47.7	58.3
R2	39.5	36.7	36.0	33.3	30.6	28.9	39.5
R3	39.8	37.0	36.3	33.6	30.9	29.2	39.8
R4	53.3	50.5	49.8	47.1	44.4	42.7	53.3
R5	53.8	51.0	50.3	47.6	44.9	43.2	53.8
R6	40.0	37.2	36.5	33.8	31.1	29.4	40.0

[1] Construction noise source and receiver locations are shown on Exhibit 10-A.
[2] Construction noise level calculations based on distance from the construction activity, which is measured from the Project site boundary to the nearest receiver locations. CadnaA typical construction noise model calculations are included in Appendix 10.1.

10.3.2 PEAK HOUR CONSTRUCTION NOISE LEVELS

Construction activities are typically evaluated as mobile sources since these activities tend to vary considerably, not only as the speed and power of the equipment varies, but also as the equipment constantly changes in terms of its distance from the receivers and its relative location. (27). However, to present a conservative analysis, the peak hour Project construction equipment noise levels by stage were also calculated at the limits of construction (Project site boundary) nearest to the affected receivers. Since it is unlikely that multiple pieces of construction equipment can operate simultaneously near the limits of construction for the entire construction period, the peak hour noise analysis likely overstates the potential Project related construction noise impacts. Table 10-3 shows that the peak hour construction equipment noise levels are expected to range from 27.8 to 74.2 dBA $L_{eq(1hr)}$ at the nearby receiver locations. Appendix 10.2 includes the loudest construction noise model calculations.

TABLE 10-3: PEAK HOUR CONSTRUCTION EQUIPMENT SUMMARY

Receiver Location[1]	Peak Hour Construction Noise Levels (dBA $L_{eq(8hr)}$)						
	Demolition	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Highest Levels[2]
R1	74.2	71.4	70.7	68.0	65.3	63.6	74.2
R2	38.4	35.6	34.9	32.2	29.5	27.8	38.4
R3	39.2	36.4	35.7	33.0	30.3	28.6	39.2
R4	57.2	54.4	53.7	51.0	48.3	46.6	57.2
R5	56.8	54.0	53.3	50.6	47.9	46.2	56.8
R6	38.8	36.0	35.3	32.6	29.9	28.2	38.8

[1] Construction noise source and receiver locations are shown on Exhibit 10-A.
[2] Construction noise level calculations based on distance from the construction activity, which is measured from the Project site boundary to the nearest receiver locations. CadnaA typical construction noise model calculations are included in Appendix 10.2.

10.4 PROJECT SITE CONSTRUCTION NOISE LEVEL COMPLIANCE

To evaluate whether the Project will generate potentially significant short-term noise levels at nearest receiver locations, the FTA construction-related daytime noise level threshold of 80 dBA L_{eq} is used to assess the daytime construction noise level impacts. The typical and peak hour construction noise analysis shows that the nearest receiver locations will not exceed the reasonable daytime 80 dBA L_{eq} significance threshold during Project construction activities as shown on Table 10-4. Therefore, the noise impacts due to Project construction noise are considered *less than significant*.

TABLE 10-4: PROJECT CONSTRUCTION NOISE COMPLIANCE

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})			
	Typical Construction (8-Hour)[2]	Peak Hour Construction (1-Hour)[3]	Threshold[4]	Threshold Exceeded?[5]
R1	58.3	74.2	80	No
R2	39.5	38.4	80	No
R3	39.8	39.2	80	No
R4	53.3	57.2	80	No
R5	53.8	56.8	80	No
R6	40.0	38.8	80	No

[1] Construction equipment noise source and receiver locations are shown on Exhibit 10-A.
[2] Typical construction equipment noise levels as shown on Table 10-2.
[3] Loudest construction equipment noise level as shown on Table 10-3.
[4] Construction noise level thresholds as shown on Table 4-1.
[5] Do the estimated Project construction noise levels exceed the construction noise level threshold?

10.5 TEMPORARY CONSTRUCTION NOISE LEVEL INCREASES

To describe the temporary Project construction noise contributions to the existing ambient noise environment, the Project construction noise levels were combined with the existing daytime ambient noise levels measurements at the nearest off-site receiver locations. The difference between the combined Project-construction and ambient noise levels is used to describe the construction noise level increases. Temporary noise increases that would be experienced at sensitive receiver locations when the typical Project construction-source noise is added to the ambient conditions are presented on Table 10-4. A temporary noise level increase of up to 15 dBA is considered a *potentially significant* impact consistent with the City of Lancaster General Plan Noise Policy 4.3.2

As indicated in Table 10-5, the Project will contribute construction noise increases ranging from 0.0 to 4.1 dBA L_{eq} during the daytime hours at the nearest receiver locations. The unmitigated construction noise analysis shows that the nearest receiver locations will not exceed the 15 dBA noise increase significance threshold during Project construction activities. The temporary construction noise level increase analysis shows that the noise impacts due to Project construction noise are considered *less than significant*.

TABLE 10-5: DAYTIME CONSTRUCTION NOISE INCREASES

Receiver Location[1]	Typical Project Construction Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Increase Criteria[7]	Increase Criteria Exceeded?
R1	58.3	L1	56.4	60.5	4.1	15	No
R2	39.5	L2	65.7	65.7	0.0	15	No
R3	39.8	L3	72.6	72.6	0.0	15	No
R4	53.3	L4	55.0	57.2	2.2	15	No
R5	53.8	L5	70.4	70.5	0.1	15	No
R6	40.0	L6	51.2	51.5	0.3	15	No

[1] Construction noise source and receiver locations are shown on Exhibit 10-A.
[2] Typical daytime construction noise levels as shown on Table 10-4.
[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 construction activities.
[6] The noise level increase expected with the addition of the proposed Project construction activities.
[7] City of Lancaster General Plan Safety Element Policy 4.3.2.

10.6 NIGHTTIME CONCRETE POUR NOISE ANALYSIS

It is our understanding that nighttime concrete pouring activities may occur as a part of Project building construction activities. Nighttime concrete pouring activities are often used to support reduced concrete mixer truck transit times and lower air temperatures than during the daytime hours and are generally limited to the actual building pad and loading dock areas. However, nighttime construction activities are prohibited by LMC Section 8.24.040. Exceptions can be granted based on a specific request from a contractor for specific dates with justification. In addition, any nighttime construction noise activities shall satisfy the FTA residential 70 dBA L_{eq} noise limit outlined in Table 4-1.

10.6.1 NIGHTTIME CONCRETE POUR REFERENCE NOISE LEVEL MEASUREMENTS

To estimate the noise levels due to nighttime concrete pour activities, sample reference noise level measurements were taken during a nighttime concrete pour at an unrelated construction site. Urban Crossroads, Inc. collected short-term nighttime concrete pour reference noise level measurements during the noise-sensitive nighttime hours between 1:00 a.m. to 2:00 a.m. at 27334 San Bernardino Avenue in the City of Redlands. The reference noise levels describe the expected concrete pour noise sources that may include concrete mixer truck movements and pouring activities, concrete paving equipment, rear mounted concrete mixer truck backup alarms, engine idling, air brakes, generators, and workers communicating/whistling. To describe the nighttime concrete pour noise levels associated with the construction of the Westside Annexation and North Lancaster Industrial Specific Plan, this analysis relies on reference sound pressure level of 67.7 dBA L_{eq} at 50 feet represented by a sound power level (L_w) of 100.3 dBA L_w. While the Project noise levels will depend on the actual duration of activities and specific equipment fleet in use at the time of construction, the reference sound power level of 100.3 dBA L_w is used to describe the expected Project nighttime concrete pour noise activities.

10.6.2 NIGHTTIME CONCRETE POUR NOISE LEVEL COMPLIANCE

As shown on Table 10-6, the noise levels associated with the nighttime concrete pour activities are estimated to range from 21.4 to 40.2 dBA L_{eq} and will satisfy the City of Lancaster stationary-source nighttime exterior hourly average L_{eq} residential noise level threshold at all the receiver locations. Based on the results of this analysis, all the nearest noise receiver locations will experience *less than significant* impacts due to the Project related nighttime concrete pour activities. Appendix 10.3 includes the CadnaA nighttime concrete pour noise model inputs.

TABLE 10-6: NIGHTTIME CONCRETE POUR NOISE COMPLIANCE

Receiver Location[1]	Concrete Pour Construction Noise Levels (dBA L_{eq})		
	Exterior Noise Levels[2]	Threshold[3]	Threshold Exceeded?[4]
R1	40.2	70	No
R2	21.4	70	No
R3	21.7	70	No
R4	35.2	70	No
R5	35.7	70	No
R6	21.9	70	No

[1] Construction noise source and receiver locations are shown on Exhibit 10-A.
[2] Unmitigated Nighttime Concrete Pour noise model calculations are included in Appendix 10.3.
[3] Construction noise level thresholds as shown on Table 4-1.
[4] Do the estimated Project construction noise levels exceed the construction noise level threshold?

10.6.3 TEMPORARY CONCRETE POUR NOISE LEVEL INCREASES

To describe the temporary concrete pour noise contributions, the concrete pour noise levels were combined with the existing nighttime ambient noise levels measurements at the nearest off-site receiver locations. The difference between the combined Project-construction and ambient noise levels is used to describe the construction noise level increases. Temporary noise increases that would be experienced at sensitive receiver locations when the typical Project construction-source noise is added to the ambient conditions are presented on Table 10-7. A temporary noise level increase of up to 15 dBA is considered a *potentially significant* impact consistent with the City of Lancaster General Plan Noise Policy 4.3.2

As indicated in Table 10-7, the Project nighttime concrete pour activities will contribute noise increases ranging from 0.0 to 0.5 dBA L_{eq} during the nighttime hours at the nearest receiver locations. The unmitigated construction noise analysis shows that the nearest receiver locations will not exceed the 15 dBA noise increase significance threshold during Project construction activities. Therefore, the temporary concrete pour construction noise increase analysis shows that the noise impacts due to Project construction noise are *less than significant*.

TABLE 10-7: NIGHTTIME CONCRETE POUR NOISE INCREASES

Receiver Location[1]	Concrete Pour Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Increase Criteria[7]	Increase Criteria Exceeded?
R1	40.2	L1	48.9	49.4	0.5	15	No
R2	21.4	L2	55.1	55.1	0.0	15	No
R3	21.7	L3	64.6	64.6	0.0	15	No
R4	35.2	L4	47.7	47.9	0.2	15	No
R5	35.7	L5	59.8	59.8	0.0	15	No
R6	21.9	L6	46.9	46.9	0.0	15	No

[1] Construction noise source and receiver locations are shown on Exhibit 10-A.
[2] Nighttime concrete pour noise levels as shown on Table 10-6.
[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 nighttime ambient conditions plus the Project construction activities.
[6] The noise level increase expected with the addition of the proposed Project construction activities.
[7] City of Lancaster General Plan Safety Element Policy 4.3.2.

10.7 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 10-8. 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 10-8: 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
Vibratory Roller	0.210

Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual

Using the vibration source level of construction equipment provided on Table 10-8 and the construction vibration assessment methodology published by the FTA, it is possible to estimate the Project vibration impacts. Table 10-9 presents the expected Project related vibration levels at the nearby receiver locations. At distances ranging from 145 to 8,077 feet from Project construction activities, construction vibration velocity levels are estimated to range from 0.000 to 0.015 PPV in/sec. Based on maximum acceptable continuous vibration threshold of 0.3 PPV (in/sec), the typical Project construction vibration levels will fall below the building damage thresholds at all the noise sensitive receiver locations. Therefore, the Project-related vibration impacts are considered *less than significant* during typical construction activities at the Project site.

TABLE 10-9: CONSTRUCTION VIBRATION LEVELS

Location[1]	Distance to Const. Activity (Feet)[2]	Typical Construction Vibration Levels PPV (in/sec)[3]						Thresholds PPV (in/sec)[4]	Thresholds Exceeded?[5]
		Small bulldozer	Jack-hammer	Loaded Trucks	Large bulldozer	Vibratory Roller	Highest Vibration Level		
R1	145'	0.000	0.003	0.005	0.006	0.015	0.015	0.3	No
R2	7,213'	0.000	0.000	0.000	0.000	0.000	0.000	0.5	No
R3	8,077'	0.000	0.000	0.000	0.000	0.000	0.000	0.3	No
R4	974'	0.000	0.000	0.000	0.000	0.001	0.001	0.3	No
R5	1,019'	0.000	0.000	0.000	0.000	0.001	0.001	0.3	No
R6	5,936'	0.000	0.000	0.000	0.000	0.000	0.000	0.3	No

[1] Vibration source and building locations are shown on Exhibit 10-A.
[2] Distance from building facade to Project construction boundary.
[3] Based on the Vibration Source Levels of Construction Equipment (Table 10-8).
[4] Caltrans Transportation and Construction Vibration Guidance Manual, Table 19 and 20
[5] Does the peak vibration exceed the acceptable vibration thresholds?
"PPV" = Peak Particle Velocity

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11 REFERENCES

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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 Noise Barrier Design Handbook.* 2001.
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9. **California Department of Transportation.** *Transportation and Construction Vibration Guidance Manual.* April 2020.
10. **Office of Planning and Research.** *State of California General Plan Guidelines.* October 2017.
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21. **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.
22. **California Department of Transportation.** *Traffic Noise Attenuation as a Function of Ground and Vegetation Final Report.* June 1995. FHWA/CA/TL-95/23.
23. **City of Lancaster.** *General Plan 2030 Program Environmental Impact Report Technical Appendices.* December 2008.
24. **Urban Crossroads, Inc.** *Westside Annexation and North Lancaster Industrial Specific Plan Local Transportation Assessment.* March 2025.
25. **County of Los Angeles.** *Los Angeles County General Plan Update Draft Environmental Impact Report.* June 2014. State Clearinghouse #2011081042.
26. **California Department of Transportation.** *Highway Design Manual, Chapter 1100 Highway Traffic Noise Abatement.* November 2017.
27. **U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning.** *FHWA Roadway Construction Noise Model.* January, 2006.
28. **U.S. Department of Transportation, Federal Highway Administration.** *FHWA Highway Construction Noise Handbook.* Final Report August 2006.

12 CERTIFICATION

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed Westside Annexation and North Lancaster Industrial 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.

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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 San Diego • March, 2018
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 LANCASTER MUNICIPAL CODE

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Chapter 8.24 NOISE REGULATIONS

8.24.010 Declaration of policy.

It is declared to be the policy of the city to prohibit unnecessary, excessive and annoying noises from all sources subject to its police power. At certain levels noises are detrimental to the health and welfare of the citizenry, and, in the public interests, such noise levels shall be systematically proscribed.

(Prior code § 4-1.1)

8.24.020 Definitions.

Unless the context otherwise clearly indicates, the words and phrases used in this chapter are defined as follows:

"Commercial purpose" means and includes the use, operation or maintenance of any sound-amplifying equipment for the purpose of advertising any business, or any goods, or any services, or for the purpose of attracting the attention of the public to, or advertising for, or soliciting patronage or customers to or for any performance, show, entertainment, exhibition or event, for the purpose of demonstrating any such sound equipment.

"Day" means the time period from seven a.m. to eight p.m.

"Impulsive sound" means a short-duration sound (such as might be produced by the impact of a drop hammer or a pile driver) with one second or less duration.

"Motor vehicles" means and includes, but is not limited to, automobiles, trucks, motorcycles, mini-bikes and go-carts.

"Night" means the time period from eight p.m. to seven a.m.

"Noncommercial purpose" means the use, operation or maintenance of any sound equipment for other than a commercial purpose. "Noncommercial purpose" means and includes, but shall not be limited to, philanthropic, political, patriotic and charitable purposes.

"Person" means a person, firm, association, co-partnership, joint venture, corporation, or any entity, public or private, in nature.

"Sound" means the sensation perceived by the sense of hearing. For the purpose of this chapter, the terms "sound" and "noise" shall be used synonymously.

"Sound-amplifying equipment" means any machine or device for the amplification of the human voice, music or any other sound, but shall not include:

1. Warning devices on emergency vehicles;

2. Horns, burglar and fire alarms, or other warning devices expressly authorized by law.

"Sound truck" means any motor vehicle, or any other vehicle, regardless of motive power, whether in motion or stationary, which carries, is equipped with, or which has mounted thereon or attached thereto any sound-amplifying equipment for commercial, political and charitable purposes.

(Prior code § 4-1.2)

(Ord. No. 916, § 1, 2-10-09)

8.24.030 Loud, unnecessary and unusual noises prohibited.

Notwithstanding any other provision of this chapter, and in addition thereto, no person shall make, cause or suffer, or permit to be made upon any premises owned, occupied or controlled by him/her any unnecessary noises or sounds which are physically annoying to persons of ordinary sensitiveness which are so harsh or so prolonged or unnatural or unusual in their use, time, or place as to occasion physical discomfort to the inhabitants of any neighborhood. All animals shall be so maintained.

(Ord. 791 § 1, 2001: Ord. 693 § 1 (part), 1995: prior code § 4-1.3)

8.24.040 Loud, unnecessary and unusual noises prohibited—Construction and building.

Except as otherwise provided in this chapter, a person at any time on Sunday or any day between the hours of eight p.m. and seven a.m. shall not perform any construction or repair work of any kind upon any building or structure or perform any earth excavating, filling or moving where any of the foregoing entails the use of any air compressor, jack hammer, power-driven drill, riveting machine, excavator, diesel-powered truck, tractor or other earth-moving equipment, hard hammers on steel or iron or any other machine tool, device or equipment which makes loud noises within five hundred (500) feet of an occupied dwelling, apartment, hotel, mobile home or other place of residence.

(Ord. 693 § 1 (part), 1995: prior code § 4-1.4)

(Ord. No. 916, § 2, 2-10-09)

8.24.050 Exceptions.

A. The provisions of Section 8.24.040 do not apply to any person who performs the construction, repair, excavation or moving work pursuant to the express written permission of the city engineer to perform such work at times prohibited in Section 8.24.040. Upon receipt of an application stating the reasons for the request, the city engineer may grant such permission if he finds that:

   1. The work proposed to be done is effected with the public interest; or

   2. Hardship or injustice or unreasonable delay would result with the interruption thereof with the hours and days specified in Section 8.24.040; or

   3. The building or structure involved is devoted or intended to be devoted to a use immediately incident to public interest.

B. The provisions of Section 8.24.040 do not apply to the construction, repair or excavation during prohibited hours as may be necessary to restore property to a safe condition following a public calamity or work required to protect persons or property from imminent exposure to danger or work by private or public utility companies when restoring utility service.

(Prior code § 4-1.5)

8.24.060 Violation—Penalty.

Every person who violates any of the provisions of this chapter is guilty of an infraction and upon conviction is punishable as provided in Chapter 1.12 of the Lancaster Municipal Code or as otherwise provided in California Penal Code Section 415.

Violations of any of the provisions of this chapter may, in the alternative, be punished by the issuance of an administrative citation, the penalty amount of which shall be assessed at a rate as set forth in the fee schedule in Section 1.12.020 of Chapter 1.12 of this code.

As an alternative to paying the amount of the administrative citation, a cited person may elect to enroll in and perform community service, as set forth in Section 1.16.095 of Chapter 1.16 of this code. A cited person who has been granted an indigency waiver pursuant to Section 1.16.085 of Chapter 1.16 of this code shall enroll in and perform community service as an alternative to paying the amount of the administrative citation.

(Prior code § 4-1.6)

(Ord. No. 1097, § 4(Exh. C), 1-10-2023)

8.24.070 Injunctions.

As an additional remedy, the operation or maintenance of any device, instrument, vehicle or machinery in violation of any provision of this chapter shall be deemed and is declared to be a public nuisance, and may be subject to abatement summarily by a restraining order or injunction issued by a court of competent jurisdiction.

(Prior code § 4-1.7)

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APPENDIX 5.1:

STUDY AREA PHOTOS

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16126_L1_B 1.North
34, 45' 39.320000", 118, 9' 59.910000"

16126_L1_B 2.South
34, 45' 39.060000", 118, 9' 59.800000"

16126_L1_B 3.East
34, 45' 39.000000", 118, 9' 59.830000"

16126_L1_B 4.West
34, 45' 38.990000", 118, 9' 59.880000"

16126_L2_E 1.North
34, 43' 14.420000", 118, 10' 29.050000"

16126_L2_E 2.South
34, 43' 14.310000", 118, 10' 29.160000"

16126_L2_E 3.East
34, 43' 14.220000", 118, 10' 29.100000"

16126_L2_E 4.West
34, 43' 14.200000", 118, 10' 29.130000"

JN:16126

16126_L3_G 1.North
34, 43' 7.210000", 118, 9' 8.600000"

16126_L3_G 2.South
34, 43' 7.200000", 118, 9' 8.520000"

16126_L3_G 3.East
34, 43' 7.210000", 118, 9' 8.520000"

16126_L3_G 4.West
34, 43' 7.250000", 118, 9' 8.740000"

16126_L4_H 1.North
34, 44' 39.950000", 118, 7' 52.440000"

16126_L4_H 2.South
34, 44' 39.910000", 118, 7' 52.470000"

16126_L4_H 3.East
34, 44' 39.900000", 118, 7' 52.440000"

16126_L4_H 4.West
34, 44' 39.950000", 118, 7' 52.690000"

16126_L5_I 1.North
34, 45' 45.580000", 118, 8' 39.300000"

16126_L5_I 2.South
34, 45' 45.550000", 118, 8' 39.240000"

16126_L5_I 3.East
34, 45' 45.580000", 118, 8' 39.210000"

16126_L5_I 4.West
34, 45' 45.500000", 118, 8' 39.490000"

JN:16126

16126_L6_J 1.North
34, 47' 30.200000", 118, 8' 44.240000"

16126_L6_J 2.South
34, 47' 30.200000", 118, 8' 44.240000"

16126_L6_J 3.East
34, 47' 30.200000", 118, 8' 44.240000"

16126_L6_J 4.West
34, 47' 30.200000", 118, 8' 44.460000"

APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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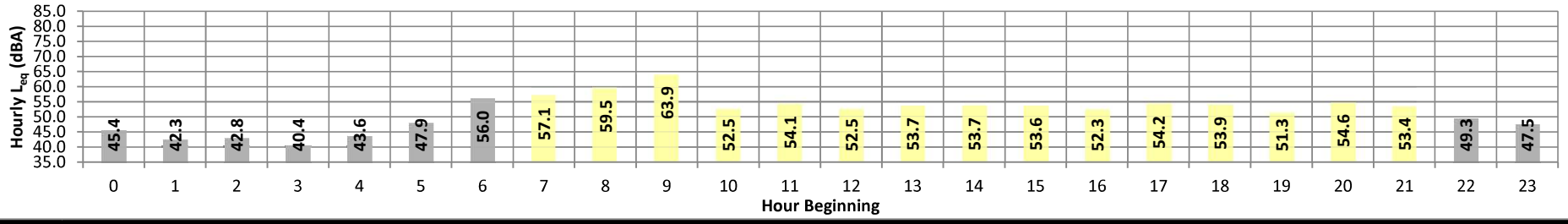
24-Hour Noise Level Measurement Summary

Date: Tuesday, December 17, 2024 | *Location:* L1 - Located west of the SP within the Leisure Lake Mobile | *Meter:* Piccolo II | *JN:* 16126

Project: North Lancaster | *Source:* Estates near the residence at 48303 20th Street West | *Analyst:* Z. Ibrahim

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	45.4	53.7	41.0	53.3	52.6	50.9	49.1	45.0	43.4	41.7	41.4	41.1	45.4	10.0	55.4
	1	42.3	51.2	38.0	50.6	50.0	47.7	46.0	41.7	40.2	38.7	38.4	38.1	42.3	10.0	52.3
	2	42.8	54.2	36.3	53.7	52.9	49.6	46.4	40.7	38.6	36.9	36.7	36.4	42.8	10.0	52.8
	3	40.4	49.0	36.9	48.5	47.6	45.1	42.6	40.1	39.0	37.5	37.3	37.0	40.4	10.0	50.4
	4	43.6	54.5	37.5	53.7	52.9	50.0	47.3	42.3	40.4	38.4	38.0	37.6	43.6	10.0	53.6
	5	47.9	57.7	40.5	57.3	56.5	54.6	53.1	46.4	43.8	41.4	41.0	40.6	47.9	10.0	57.9
	6	56.0	68.1	45.3	67.6	66.9	63.2	60.1	53.6	49.7	46.2	45.8	45.4	56.0	10.0	66.0
Day	7	57.1	66.4	50.1	66.0	65.1	62.8	61.2	57.4	53.9	51.0	50.6	50.2	57.1	0.0	57.1
	8	59.5	69.1	47.2	68.9	68.4	66.5	64.9	59.1	55.0	49.0	48.0	47.4	59.5	0.0	59.5
	9	63.9	72.7	50.5	72.5	72.4	71.4	69.8	63.1	58.7	52.0	51.3	50.7	63.9	0.0	63.9
	10	52.5	62.7	41.2	62.3	61.7	59.8	58.2	51.7	46.7	42.2	41.7	41.3	52.5	0.0	52.5
	11	54.1	62.8	41.9	62.4	61.9	60.3	59.3	54.7	50.8	44.0	43.2	42.1	54.1	0.0	54.1
	12	52.5	62.6	39.2	62.3	61.7	59.3	57.5	52.3	47.6	40.8	40.1	39.4	52.5	0.0	52.5
	13	53.7	63.1	43.0	62.7	62.1	60.0	58.5	53.8	49.7	44.6	43.9	43.1	53.7	0.0	53.7
	14	53.7	63.4	41.4	63.1	62.4	60.0	58.5	54.0	49.4	43.2	42.4	41.5	53.7	0.0	53.7
	15	53.6	62.3	41.9	61.9	61.4	59.8	58.4	54.2	50.2	43.8	42.9	42.1	53.6	0.0	53.6
	16	52.3	61.9	41.3	61.5	60.8	58.8	57.5	52.6	47.8	42.7	42.0	41.4	52.3	0.0	52.3
	17	54.2	62.3	45.8	61.9	61.5	59.8	58.5	55.0	51.3	47.1	46.5	45.9	54.2	0.0	54.2
	18	53.9	61.4	48.0	61.0	60.5	59.0	57.9	54.7	51.6	48.9	48.5	48.1	53.9	0.0	53.9
	19	51.3	59.5	44.2	59.1	58.5	56.8	55.6	51.9	48.8	45.4	44.9	44.4	51.3	5.0	56.3
	20	54.6	67.5	44.3	66.8	65.5	61.2	57.8	52.2	48.9	45.4	44.9	44.4	54.6	5.0	59.6
	21	53.4	62.3	48.5	61.7	61.0	59.0	57.4	53.3	50.6	49.0	48.8	48.6	53.4	5.0	58.4
Night	22	49.3	56.6	45.1	56.3	55.9	54.2	52.8	49.4	47.7	45.9	45.4	45.1	49.3	10.0	59.3
	23	47.5	58.6	36.8	58.2	57.7	55.6	52.2	45.3	41.3	37.9	37.4	36.9	47.5	10.0	57.5

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	51.3	59.5	39.2	59.1	58.5	56.8	55.6	51.7	46.7	40.8	40.1	39.4
	Max	63.9	72.7	50.5	72.5	72.4	71.4	69.8	63.1	58.7	52.0	51.3	50.7
Energy Average		56.4	Average:		63.6	63.0	61.0	59.4	54.7	50.7	45.9	45.3	44.7
Night	Min	40.4	49.0	36.3	48.5	47.6	45.1	42.6	40.1	38.6	36.9	36.7	36.4
	Max	56.0	68.1	45.3	67.6	66.9	63.2	60.1	53.6	49.7	46.2	45.8	45.4
Energy Average		48.9	Average:		55.5	54.8	52.3	50.0	44.9	42.7	40.5	40.2	39.8

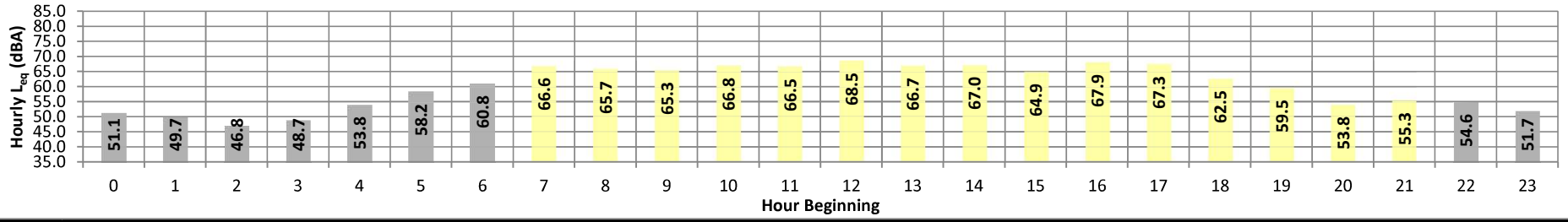
24-Hour CNEL	Leq (dBA) Daytime (7am-10pm)	Leq (dBA) Nighttime (10pm-7am)
57.9	**56.4**	**48.9**

24-Hour Noise Level Measurement Summary

Date: Tuesday, December 17, 2024 *Location:* L2 - Located southwest of the SP at the southern entry for the *Meter:* Piccolo II *JN:* 16126

Project: North Lancaster *Source:* Antelope Valley Fairgrounds at 2551 Avenue G8. *Analyst:* Z. Ibrahim

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	51.1	59.6	40.3	59.3	59.1	57.9	56.4	51.5	46.8	41.4	40.9	40.4	51.1	10.0	61.1
	1	49.7	58.3	40.1	58.1	57.7	56.7	55.6	50.0	44.1	41.0	40.5	40.2	49.7	10.0	59.7
	2	46.8	55.1	38.3	54.7	54.2	53.0	51.9	47.7	43.0	39.0	38.7	38.4	46.8	10.0	56.8
	3	48.7	57.2	38.1	56.9	56.5	55.2	54.1	49.0	43.8	38.9	38.6	38.2	48.7	10.0	58.7
	4	53.8	61.1	42.2	60.8	60.5	59.6	58.7	54.9	50.9	44.1	43.2	42.4	53.8	10.0	63.8
	5	58.2	64.1	50.5	63.9	63.6	62.7	61.9	59.4	56.9	52.1	51.4	50.7	58.2	10.0	68.2
	6	60.8	65.1	55.1	64.9	64.8	64.2	63.9	62.0	60.1	56.7	55.9	55.2	60.8	10.0	70.8
Day	7	66.6	75.3	58.7	75.0	74.5	72.5	71.0	66.7	63.8	60.2	59.6	58.9	66.6	0.0	66.6
	8	65.7	74.6	57.4	74.3	73.9	72.0	70.2	65.5	62.4	58.9	58.2	57.6	65.7	0.0	65.7
	9	65.3	74.4	55.4	74.1	73.6	71.5	70.1	65.2	61.9	57.0	56.3	55.5	65.3	0.0	65.3
	10	66.8	78.1	54.8	77.7	76.8	73.7	71.6	65.6	61.6	56.4	55.7	54.9	66.8	0.0	66.8
	11	66.5	76.5	54.6	76.2	75.6	73.4	71.7	65.9	61.7	56.7	55.8	54.7	66.5	0.0	66.5
	12	68.5	79.4	54.9	79.0	78.2	75.6	73.6	67.5	62.7	57.1	56.0	55.1	68.5	0.0	68.5
	13	66.7	76.8	56.2	76.4	75.9	73.4	71.5	66.4	62.4	57.9	57.1	56.3	66.7	0.0	66.7
	14	67.0	76.8	56.0	76.5	75.9	73.6	71.6	66.7	63.4	57.9	57.0	56.2	67.0	0.0	67.0
	15	64.9	74.3	54.1	74.0	73.4	71.2	69.7	64.8	61.3	56.2	55.2	54.4	64.9	0.0	64.9
	16	67.9	78.9	57.2	78.4	77.6	74.3	72.5	66.8	63.5	58.7	58.0	57.4	67.9	0.0	67.9
	17	67.3	75.9	59.6	75.5	75.0	73.0	71.7	67.5	64.7	61.2	60.4	59.8	67.3	0.0	67.3
	18	62.5	68.6	56.7	68.4	68.0	66.6	65.7	63.4	61.3	58.0	57.4	56.8	62.5	0.0	62.5
	19	59.5	65.3	53.3	65.0	64.8	63.8	62.8	60.5	58.4	54.8	54.0	53.4	59.5	5.0	64.5
	20	53.8	58.9	46.5	58.7	58.5	57.9	57.3	55.1	52.9	48.2	47.4	46.7	53.8	5.0	58.8
	21	55.3	64.3	46.9	64.0	63.4	61.1	59.2	55.4	52.9	48.6	47.8	47.0	55.3	5.0	60.3
Night	22	54.6	61.7	44.6	61.5	61.0	59.7	58.8	55.8	52.8	47.0	46.0	44.9	54.6	10.0	64.6
	23	51.7	59.9	39.6	59.6	59.3	58.1	56.8	52.5	48.2	41.4	40.5	39.7	51.7	10.0	61.7

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	53.8	58.9	46.5	58.7	58.5	57.9	57.3	55.1	52.9	48.2	47.4	46.7
	Max	68.5	79.4	59.6	79.0	78.2	75.6	73.6	67.5	64.7	61.2	60.4	59.8
Energy Average		65.7	Average:		72.9	72.3	70.2	68.7	64.2	61.0	56.5	55.7	55.0
Night	Min	46.8	55.1	38.1	54.7	54.2	53.0	51.9	47.7	43.0	38.9	38.6	38.2
	Max	60.8	65.1	55.1	64.9	64.8	64.2	63.9	62.0	60.1	56.7	55.9	55.2
Energy Average		55.1	Average:		60.0	59.6	58.6	57.6	53.6	49.6	44.6	44.0	43.3

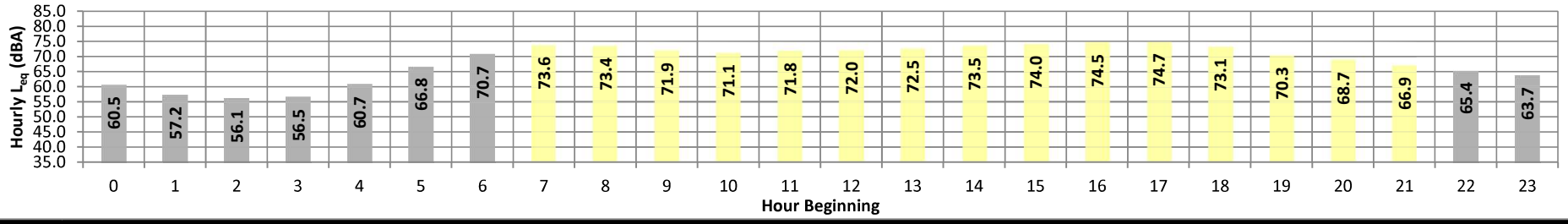
24-Hour CNEL	Leq (dBA) Daytime (7am-10pm)	Leq (dBA) Nighttime (10pm-7am)
65.6	**65.7**	**55.1**

24-Hour Noise Level Measurement Summary

Date: Tuesday, December 17, 2024 *Location:* L3 - Located south of the SP near the existing single-family *Meter:* Piccolo II *JN:* 16126

Project: North Lancaster *Source:* residence at 1145 Regents Street. *Analyst:* Z. Ibrahim

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	60.5	73.0	38.9	72.6	71.8	68.8	66.0	55.5	48.2	40.4	39.6	39.1	60.5	10.0	70.5
	1	57.2	70.5	38.7	70.1	69.2	65.6	62.0	48.3	41.9	39.5	39.1	38.8	57.2	10.0	67.2
	2	56.1	68.7	37.9	68.3	67.5	64.3	61.4	50.5	42.7	38.9	38.6	38.1	56.1	10.0	66.1
	3	56.5	69.3	38.4	68.9	68.1	64.9	61.9	50.2	42.6	39.1	38.9	38.6	56.5	10.0	66.5
	4	60.7	73.0	42.0	72.6	71.8	68.4	65.5	57.8	51.2	43.8	43.0	42.1	60.7	10.0	70.7
	5	66.8	78.2	50.2	77.8	76.9	74.1	72.0	65.3	60.0	52.0	51.1	50.4	66.8	10.0	76.8
	6	70.7	80.3	56.6	79.9	79.2	77.2	75.9	71.1	65.7	58.6	57.6	56.8	70.7	10.0	80.7
Day	7	73.6	82.0	59.3	81.7	81.0	79.3	78.3	74.9	70.4	61.9	60.5	59.5	73.6	0.0	73.6
	8	73.4	81.4	61.1	81.1	80.4	78.8	77.9	74.9	70.6	63.0	62.0	61.2	73.4	0.0	73.4
	9	71.9	80.9	57.4	80.5	79.9	77.9	76.7	72.9	67.7	59.8	58.6	57.6	71.9	0.0	71.9
	10	71.1	80.0	55.6	79.6	78.9	77.0	76.0	72.2	67.2	58.5	56.9	55.8	71.1	0.0	71.1
	11	71.8	79.9	56.5	79.6	79.0	77.3	76.5	73.1	68.7	59.8	58.0	56.8	71.8	0.0	71.8
	12	72.0	80.5	56.3	80.1	79.5	77.7	76.7	73.4	68.6	59.9	58.1	56.5	72.0	0.0	72.0
	13	72.5	80.5	58.4	80.2	79.6	78.2	77.1	74.0	69.7	61.5	60.2	58.6	72.5	0.0	72.5
	14	73.5	80.9	59.7	80.6	80.1	78.8	78.0	75.1	71.2	62.3	61.1	59.9	73.5	0.0	73.5
	15	74.0	81.4	58.8	81.1	80.5	79.0	78.2	75.5	71.9	62.2	60.3	59.0	74.0	0.0	74.0
	16	74.5	82.7	58.7	82.4	81.7	79.9	78.9	76.0	72.1	62.1	60.2	58.8	74.5	0.0	74.5
	17	74.7	82.5	60.6	82.1	81.4	79.7	78.9	76.3	72.6	63.5	62.0	60.8	74.7	0.0	74.7
	18	73.1	81.8	59.6	81.4	80.8	79.0	77.7	74.1	69.9	62.3	60.9	59.8	73.1	0.0	73.1
	19	70.3	79.0	56.2	78.7	78.1	76.3	75.4	71.3	65.9	58.6	57.4	56.4	70.3	5.0	75.3
	20	68.7	78.6	53.4	78.3	77.5	75.3	73.8	68.9	63.0	56.1	55.0	53.7	68.7	5.0	73.7
	21	66.9	76.9	50.3	76.6	75.9	73.8	72.5	66.9	60.3	52.8	51.6	50.6	66.9	5.0	71.9
Night	22	65.4	76.3	45.2	75.9	75.2	72.9	71.3	64.2	56.7	47.7	46.4	45.4	65.4	10.0	75.4
	23	63.7	76.5	45.4	76.0	75.0	71.0	68.2	60.6	54.3	48.2	47.1	45.8	63.7	10.0	73.7

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	66.9	76.9	50.3	76.6	75.9	73.8	72.5	66.9	60.3	52.8	51.6	50.6
	Max	74.7	82.7	61.1	82.4	81.7	79.9	78.9	76.3	72.6	63.5	62.0	61.2
Energy Average		72.6	Average:		80.3	79.6	77.9	76.8	73.3	68.6	60.3	58.9	57.7
Night	Min	56.1	68.7	37.9	68.3	67.5	64.3	61.4	48.3	41.9	38.9	38.6	38.1
	Max	70.7	80.3	56.6	79.9	79.2	77.2	75.9	71.1	65.7	58.6	57.6	56.8
Energy Average		64.6	Average:		73.6	72.7	69.7	67.1	58.2	51.5	45.4	44.6	43.9

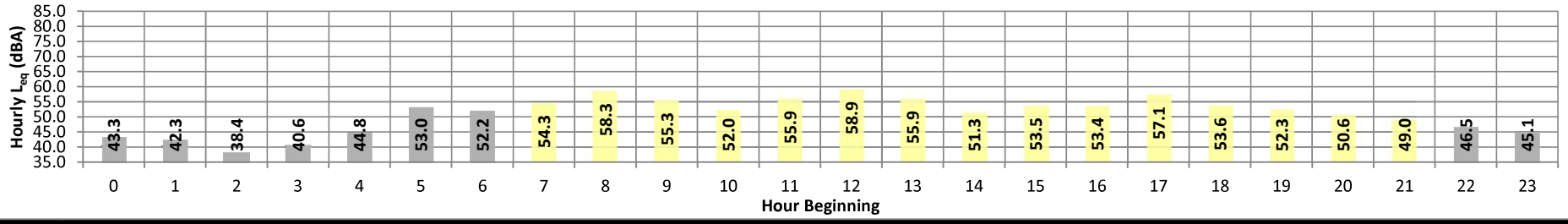
24-Hour CNEL	Leq (dBA) Daytime (7am-10pm)	Leq (dBA) Nighttime (10pm-7am)
73.8	72.6	64.6

24-Hour Noise Level Measurement Summary

Date: Tuesday, December 17, 2024 | *Location:* L4 - Located east of the SP at the southwest corner of | *Meter:* Piccolo II | *JN:* 16126

Project: North Lancaster | *Source:* intersection of Division Street and W Avenue F4. | *Analyst:* Z. Ibrahim

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	43.3	52.6	35.7	52.3	51.6	49.9	48.2	43.1	39.0	36.3	36.0	35.7	43.3	10.0	53.3
	1	42.3	53.4	34.8	53.0	52.5	50.4	47.2	38.6	36.9	35.3	35.1	34.9	42.3	10.0	52.3
	2	38.4	46.4	34.6	46.0	45.2	43.1	41.6	38.4	36.9	34.9	34.8	34.6	38.4	10.0	48.4
	3	40.6	51.2	34.5	50.7	50.0	48.1	45.2	38.1	36.5	34.9	34.7	34.6	40.6	10.0	50.6
	4	44.8	56.1	36.6	55.7	54.9	52.6	49.8	41.2	39.2	37.2	36.9	36.7	44.8	10.0	54.8
	5	53.0	60.4	50.0	59.7	59.2	57.8	56.6	52.2	51.3	50.4	50.2	50.1	53.0	10.0	63.0
	6	52.2	63.1	44.5	62.7	61.9	59.4	56.6	50.1	47.4	45.4	45.0	44.6	52.2	10.0	62.2
Day	7	54.3	64.3	46.8	63.9	63.2	61.3	59.4	53.0	50.2	47.6	47.3	46.9	54.3	0.0	54.3
	8	58.3	68.6	51.2	68.0	67.0	64.7	62.7	57.3	54.9	52.5	51.7	51.3	58.3	0.0	58.3
	9	55.3	66.2	39.3	65.9	65.5	63.7	61.0	52.4	46.2	40.4	39.9	39.4	55.3	0.0	55.3
	10	52.0	62.5	39.4	62.1	61.6	59.7	57.7	50.2	44.7	40.4	39.9	39.5	52.0	0.0	52.0
	11	55.9	66.7	47.5	66.0	65.3	63.0	61.7	54.7	50.0	47.9	47.7	47.5	55.9	0.0	55.9
	12	58.9	68.2	53.9	67.8	67.2	65.4	63.2	57.6	55.8	54.6	54.3	54.0	58.9	0.0	58.9
	13	55.9	67.0	40.1	66.9	66.4	64.4	61.5	52.3	46.0	41.6	41.1	40.3	55.9	0.0	55.9
	14	51.3	62.0	38.8	61.7	61.1	59.1	57.2	49.3	43.9	39.9	39.4	38.9	51.3	0.0	51.3
	15	53.5	64.3	40.7	63.9	63.2	61.3	59.2	51.8	46.6	42.0	41.4	40.8	53.5	0.0	53.5
	16	53.4	63.8	41.4	63.5	62.9	60.8	58.9	52.3	46.7	42.7	42.1	41.6	53.4	0.0	53.4
	17	57.1	71.1	44.8	69.6	68.3	64.1	60.7	54.1	49.5	45.9	45.5	45.0	57.1	0.0	57.1
	18	53.6	63.5	45.0	63.2	62.6	60.2	58.4	53.1	49.3	46.2	45.7	45.1	53.6	0.0	53.6
	19	52.3	62.2	43.7	61.8	61.2	59.4	57.9	51.2	47.6	44.8	44.3	43.8	52.3	5.0	57.3
	20	50.6	61.0	43.2	60.6	59.8	57.1	55.0	49.3	46.9	44.3	43.8	43.4	50.6	5.0	55.6
	21	49.0	58.9	41.1	58.6	57.9	55.3	53.3	48.4	45.7	42.3	41.8	41.2	49.0	5.0	54.0
Night	22	46.5	56.1	39.0	55.7	55.0	52.5	50.7	46.2	43.6	40.3	39.6	39.1	46.5	10.0	56.5
	23	45.1	55.6	36.2	55.0	54.1	51.3	49.5	44.7	41.1	37.4	36.8	36.3	45.1	10.0	55.1

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	49.0	58.9	38.8	58.6	57.9	55.3	53.3	48.4	43.9	39.9	39.4	38.9
	Max	58.9	71.1	53.9	69.6	68.3	65.4	63.2	57.6	55.8	54.6	54.3	54.0
Energy Average		55.0	Average:		64.2	63.5	61.3	59.2	52.5	48.3	44.9	44.4	43.9
Night	Min	38.4	46.4	34.5	46.0	45.2	43.1	41.6	38.1	36.5	34.9	34.7	34.6
	Max	53.0	63.1	50.0	62.7	61.9	59.4	56.6	52.2	51.3	50.4	50.2	50.1
Energy Average		47.7	Average:		54.5	53.8	51.7	49.5	43.6	41.3	39.1	38.8	38.5

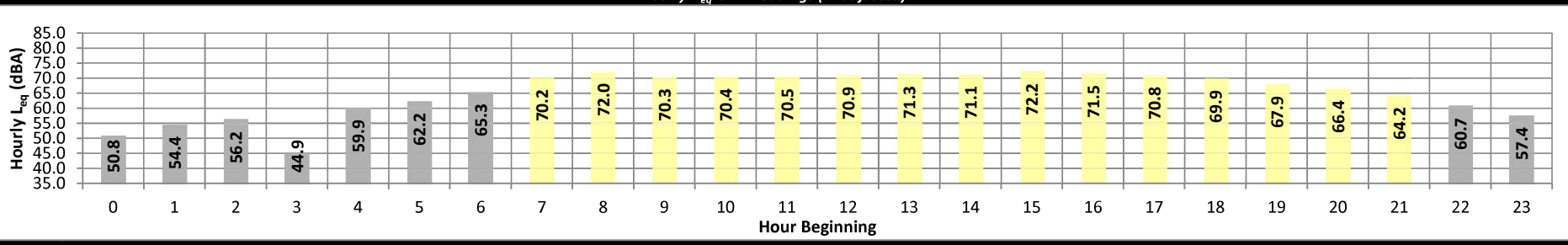
24-Hour CNEL	Leq (dBA) Daytime (7am-10pm)	Leq (dBA) Nighttime (10pm-7am)
56.5	**55.0**	**47.7**

24-Hour Noise Level Measurement Summary

Date: Tuesday, December 17, 2024 *Location:* L5 - Located east of the SP within Mitchell's Avenue E RV Park *Meter:* Piccolo II *JN:* 16126

Project: North Lancaster *Source:* at 721 Avenue E *Analyst:* Z. Ibrahim

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	50.8	62.9	34.6	62.5	61.8	58.9	56.5	46.3	38.4	35.4	34.9	34.6	50.8	10.0	60.8
	1	54.4	69.4	34.8	68.6	66.9	61.7	57.3	43.2	37.7	35.5	35.2	34.9	54.4	10.0	64.4
	2	56.2	69.7	34.5	69.3	68.3	64.2	61.1	47.7	39.5	35.1	34.8	34.6	56.2	10.0	66.2
	3	44.9	58.7	34.3	57.8	56.7	52.4	47.8	39.2	36.3	34.7	34.6	34.4	44.9	10.0	54.9
	4	59.9	72.5	49.1	71.9	71.0	66.9	64.0	56.8	53.3	50.0	49.6	49.2	59.9	10.0	69.9
	5	62.2	75.1	41.8	74.5	73.6	70.4	67.5	57.4	48.3	43.1	42.6	42.0	62.2	10.0	72.2
	6	65.3	77.0	45.7	76.5	75.5	73.0	71.2	63.4	54.4	46.7	46.2	45.8	65.3	10.0	75.3
Day	7	70.2	80.4	50.0	79.9	78.9	76.6	75.3	70.9	64.2	52.1	50.9	50.1	70.2	0.0	70.2
	8	72.0	81.1	52.5	80.6	79.9	78.2	77.1	73.2	67.6	56.0	54.1	52.7	72.0	0.0	72.0
	9	70.3	80.8	47.1	80.3	79.4	77.0	75.6	70.5	63.4	51.0	49.2	47.4	70.3	0.0	70.3
	10	70.4	81.0	49.3	80.5	79.6	77.1	75.5	70.7	64.9	52.7	50.9	49.5	70.4	0.0	70.4
	11	70.5	80.0	50.9	79.6	78.7	76.5	75.3	71.5	66.2	54.4	52.5	51.1	70.5	0.0	70.5
	12	70.9	79.9	51.9	79.5	78.7	77.0	75.9	72.0	66.5	56.1	54.2	52.3	70.9	0.0	70.9
	13	71.3	81.0	50.7	80.5	79.6	77.2	75.9	72.2	67.7	56.2	53.6	51.0	71.3	0.0	71.3
	14	71.1	79.7	51.3	79.3	78.6	76.9	75.9	72.4	67.9	56.1	53.3	51.5	71.1	0.0	71.1
	15	72.2	82.4	53.2	81.8	80.8	78.4	76.9	72.8	68.2	57.1	55.1	53.5	72.2	0.0	72.2
	16	71.5	80.9	53.4	80.4	79.6	77.7	76.3	72.4	67.6	56.8	55.2	53.7	71.5	0.0	71.5
	17	70.8	79.9	52.9	79.4	78.6	76.8	75.8	72.1	67.0	56.1	54.3	53.1	70.8	0.0	70.8
	18	69.9	80.2	51.0	79.6	78.5	76.3	75.1	70.6	64.5	53.5	52.1	51.2	69.9	0.0	69.9
	19	67.9	79.1	48.4	78.5	77.4	74.8	73.2	67.7	60.2	50.2	49.1	48.5	67.9	5.0	72.9
	20	66.4	77.9	47.4	77.4	76.3	73.7	72.0	65.1	57.3	48.7	48.0	47.5	66.4	5.0	71.4
	21	64.2	76.8	43.2	76.2	75.1	71.7	69.7	61.3	52.9	44.7	43.9	43.3	64.2	5.0	69.2
Night	22	60.7	73.5	40.9	72.8	71.7	68.4	66.0	57.4	49.5	42.8	41.9	41.1	60.7	10.0	70.7
	23	57.4	71.9	34.8	71.2	69.8	64.8	61.0	49.8	40.8	35.8	35.4	34.9	57.4	10.0	67.4

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	64.2	76.8	43.2	76.2	75.1	71.7	69.7	61.3	52.9	44.7	43.9	43.3
	Max	72.2	82.4	53.4	81.8	80.8	78.4	77.1	73.2	68.2	57.1	55.2	53.7
Energy Average		70.4	Average:		79.6	78.7	76.4	75.0	70.4	64.4	53.4	51.8	50.4
Night	Min	44.9	58.7	34.3	57.8	56.7	52.4	47.8	39.2	36.3	34.7	34.6	34.4
	Max	65.3	77.0	49.1	76.5	75.5	73.0	71.2	63.4	54.4	50.0	49.6	49.2
Energy Average		59.8	Average:		69.5	68.4	64.5	61.4	51.3	44.3	39.9	39.5	39.0

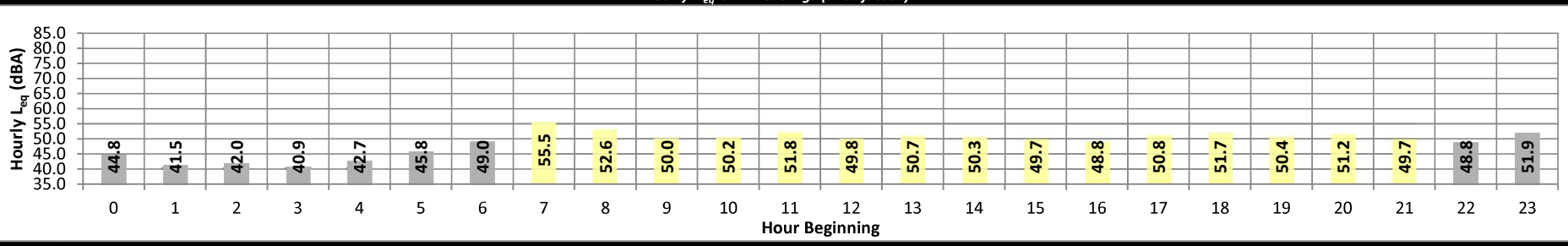
24-Hour CNEL	Leq (dBA) Daytime (7am-10pm)	Leq (dBA) Nighttime (10pm-7am)
70.6	**70.4**	**59.8**

24-Hour Noise Level Measurement Summary

Date: Tuesday, December 17, 2024 *Location:* L6 -Located northeast of the SP the existing Little Texas *Meter:* Piccolo II *JN:* 16126

Project: North Lancaster *Source:* residential use just north of Avenue C. *Analyst:* Z. Ibrahim

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	44.8	50.8	41.4	50.5	50.3	49.2	48.4	44.8	43.5	42.0	41.7	41.4	44.8	10.0	54.8
	1	41.5	45.9	39.2	45.6	45.2	44.5	43.9	41.8	40.9	39.7	39.5	39.3	41.5	10.0	51.5
	2	42.0	49.0	37.7	48.6	48.3	47.2	46.2	42.5	39.5	38.2	38.0	37.8	42.0	10.0	52.0
	3	40.9	46.2	38.4	45.9	45.5	44.5	43.6	41.0	40.0	38.8	38.6	38.5	40.9	10.0	50.9
	4	42.7	49.3	38.7	49.0	48.6	47.7	46.7	42.9	41.0	39.3	39.1	38.8	42.7	10.0	52.7
	5	45.8	53.8	41.3	53.2	52.3	50.4	49.5	46.1	43.9	41.9	41.7	41.4	45.8	10.0	55.8
	6	49.0	54.6	45.1	54.3	54.0	53.0	52.4	49.8	47.8	45.8	45.5	45.1	49.0	10.0	59.0
Day	7	55.5	60.6	50.4	60.4	60.1	59.4	58.9	56.2	54.4	51.6	51.1	50.5	55.5	0.0	55.5
	8	52.6	59.4	45.9	58.8	58.1	57.1	56.5	53.7	51.0	46.9	46.4	46.0	52.6	0.0	52.6
	9	50.0	56.9	42.5	56.6	56.3	55.3	54.4	51.0	47.6	43.9	43.3	42.8	50.0	0.0	50.0
	10	50.2	58.3	41.0	58.0	57.6	56.5	55.5	50.3	46.5	42.0	41.6	41.2	50.2	0.0	50.2
	11	51.8	59.9	43.6	59.4	58.8	57.6	56.8	52.3	48.9	44.9	44.4	43.8	51.8	0.0	51.8
	12	49.8	59.0	41.3	58.4	57.6	55.6	54.6	49.6	46.6	42.4	41.9	41.4	49.8	0.0	49.8
	13	50.7	58.6	43.4	58.0	57.2	55.8	54.6	51.6	48.9	44.8	44.2	43.6	50.7	0.0	50.7
	14	50.3	57.1	42.4	56.8	56.6	55.3	54.5	51.3	48.5	44.0	43.3	42.6	50.3	0.0	50.3
	15	49.7	56.8	42.1	56.4	56.0	54.8	53.7	50.7	47.8	43.4	42.8	42.2	49.7	0.0	49.7
	16	48.8	55.6	42.0	55.3	54.9	54.1	53.2	49.6	46.6	43.1	42.6	42.2	48.8	0.0	48.8
	17	50.8	56.8	44.3	56.5	56.2	55.5	54.9	52.0	49.2	45.2	44.8	44.4	50.8	0.0	50.8
	18	51.7	57.3	47.0	57.1	56.8	55.7	54.9	52.5	50.5	47.9	47.5	47.1	51.7	0.0	51.7
	19	50.4	56.5	45.1	56.0	55.7	54.8	54.1	51.4	48.8	46.0	45.5	45.2	50.4	5.0	55.4
	20	51.2	59.6	44.4	59.3	59.0	57.1	55.3	51.4	48.5	45.5	45.0	44.5	51.2	5.0	56.2
	21	49.7	57.7	42.9	57.1	56.6	55.1	54.2	50.2	47.0	43.8	43.4	43.0	49.7	5.0	54.7
Night	22	48.8	53.7	45.9	53.4	53.1	52.5	51.7	49.3	47.8	46.5	46.2	45.9	48.8	10.0	58.8
	23	51.9	59.5	48.2	59.2	58.8	56.7	55.8	51.7	49.7	49.0	48.9	48.2	51.9	10.0	61.9

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	48.8	55.6	41.0	55.3	54.9	54.1	53.2	49.6	46.5	42.0	41.6	41.2
	Max	55.5	60.6	50.4	60.4	60.1	59.4	58.9	56.2	54.4	51.6	51.1	50.5
Energy Average		51.2	Average:		57.6	57.2	56.0	55.1	51.6	48.7	45.0	44.5	44.0
Night	Min	40.9	45.9	37.7	45.6	45.2	44.5	43.6	41.0	39.5	38.2	38.0	37.8
	Max	51.9	59.5	48.2	59.2	58.8	56.7	55.8	51.7	49.7	49.0	48.9	48.2
Energy Average		46.9	Average:		51.1	50.7	49.5	48.7	45.5	43.8	42.4	42.1	41.8

24-Hour CNEL	*Leq (dBA) Daytime (7am-10pm)*	*Leq (dBA) Nighttime (10pm-7am)*
54.7	**51.2**	**46.9**

APPENDIX 7.1:

OFF-SITE TRAFFIC NOISE LEVEL CALCULATIONS

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing | Project Name: Westide Annex & NLISP
Road Name: 20th St. West | Job Number: 16126
Road Segment: s/o Avenue E

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,282 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	217 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	32.0 feet
Centerline Dist. to Observer:	32.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	31.828
Medium Trucks:	31.548
Heavy Trucks:	31.576

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-9.18	2.84	-1.20	-4.51	0.000	0.000
Medium Trucks:	81.00	-26.23	2.90	-1.20	-4.86	0.000	0.000
Heavy Trucks:	85.38	-23.34	2.89	-1.20	-5.72	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:	62.7	61.0	57.1	55.0	62.8	63.1
Medium Trucks:	56.5	54.8	47.7	49.9	57.2	57.3
Heavy Trucks:	63.7	61.8	57.5	57.4	64.6	64.8
Vehicle Noise:	66.7	64.9	60.5	59.8	67.2	67.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	21	45	97	209
CNEL:	22	47	101	217

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing With PAs 2, 4, 6, 7, and 8 | Project Name: Westide Annex & NLISP
Road Name: 20th St. West | Job Number: 16126
Road Segment: s/o Avenue E

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,344 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	508 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	32.0 feet
Centerline Dist. to Observer:	32.0 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:	77.4%	7.9%	14.8%	82.59%
Medium Trucks:	77.4%	3.8%	18.8%	3.73%
Heavy Trucks:	73.4%	6.8%	19.9%	13.68%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	31.828
Medium Trucks:	31.548
Heavy Trucks:	31.576

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-6.06	2.84	-1.20	-4.51	0.000	0.000
Medium Trucks:	81.00	-19.52	2.90	-1.20	-4.86	0.000	0.000
Heavy Trucks:	85.38	-13.87	2.89	-1.20	-5.72	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:	65.8	64.1	60.2	58.1	65.9	66.2
Medium Trucks:	63.2	61.5	54.4	56.6	63.9	64.0
Heavy Trucks:	73.2	71.3	66.9	66.9	74.1	74.3
Vehicle Noise:	74.3	72.4	68.0	67.8	75.0	75.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	69	149	321	692
CNEL:	72	154	333	717

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031) | Project Name: Westide Annex & NLISP
Road Name: 20th St. West | Job Number: 16126
Road Segment: s/o Avenue E

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,299 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	314 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	32.0 feet
Centerline Dist. to Observer:	32.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	31.828
Medium Trucks:	31.548
Heavy Trucks:	31.576

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-7.57	2.84	-1.20	-4.51	0.000	0.000
Medium Trucks:	81.00	-24.63	2.90	-1.20	-4.86	0.000	0.000
Heavy Trucks:	85.38	-21.74	2.89	-1.20	-5.72	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	62.6	58.7	56.6	64.4	64.7
Medium Trucks:	58.1	56.4	49.3	51.5	58.8	58.9
Heavy Trucks:	65.3	63.4	59.1	59.0	66.2	66.4
Vehicle Noise:	68.3	66.5	62.1	61.4	68.8	69.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	27	58	124	268
CNEL:	28	60	129	278

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031) With PAs 2, 4, | Project Name: Westide Annex & NLISP
Road Name: 20th St. West | Job Number: 16126
Road Segment: s/o Avenue E

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,362 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	605 vehicles
Vehicle Speed:	50 mph
Near/Far Lane Distance:	12 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	32.0 feet
Centerline Dist. to Observer:	32.0 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:	77.4%	7.9%	14.8%	84.50%
Medium Trucks:	77.4%	3.8%	18.8%	3.43%
Heavy Trucks:	73.4%	6.8%	19.9%	12.07%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	31.828
Medium Trucks:	31.548
Heavy Trucks:	31.576

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	70.20	-5.21	2.84	-1.20	-4.51	0.000	0.000
Medium Trucks:	81.00	-19.12	2.90	-1.20	-4.86	0.000	0.000
Heavy Trucks:	85.38	-13.66	2.89	-1.20	-5.72	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	64.9	61.0	59.0	66.7	67.0
Medium Trucks:	63.6	61.9	54.8	57.0	64.3	64.4
Heavy Trucks:	73.4	71.5	67.2	67.1	74.3	74.5
Vehicle Noise:	74.6	72.7	68.3	68.1	75.3	75.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	73	156	337	726
CNEL:	75	162	349	752

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing | Project Name: Westide Annex & NLISP
Road Name: Sierra Hwy. | Job Number: 16126
Road Segment: n/o Avenue A

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,782 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	645 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-4.86	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-21.91	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-19.02	-0.29	-1.20	-5.35	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	63.7	59.8	57.8	65.5	65.8
Medium Trucks:	59.0	57.3	50.2	52.4	59.7	59.8
Heavy Trucks:	65.9	64.0	59.6	59.5	66.8	67.0
Vehicle Noise:	69.1	67.3	63.0	62.2	69.6	69.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	56	120	259	559
CNEL:	58	125	269	580

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing With PAs 2, 4, 6, 7, and 8 | Project Name: Westide Annex & NLISP
Road Name: Sierra Hwy. | Job Number: 16126
Road Segment: n/o Avenue A

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,841 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	746 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	92.10%
Medium Trucks:	77.4%	3.8%	18.8%	2.22%
Heavy Trucks:	73.4%	6.8%	19.9%	5.67%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-4.34	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-20.51	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-16.45	-0.29	-1.20	-5.35	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:	65.9	64.2	60.3	58.3	66.0	66.3
Medium Trucks:	60.4	58.7	51.6	53.8	61.1	61.2
Heavy Trucks:	68.5	66.5	62.2	62.1	69.3	69.6
Vehicle Noise:	70.8	69.0	64.6	64.1	71.4	71.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	73	158	340	733
CNEL:	76	164	353	761

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031) | Project Name: Westide Annex & NLISP
Road Name: Sierra Hwy. | Job Number: 16126
Road Segment: n/o Avenue A

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,642 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	727 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-4.34	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-21.40	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-18.50	-0.29	-1.20	-5.35	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:	65.9	64.2	60.3	58.3	66.0	66.3
Medium Trucks:	59.5	57.8	50.7	52.9	60.2	60.4
Heavy Trucks:	66.4	64.5	60.1	60.1	67.3	67.5
Vehicle Noise:	69.6	67.8	63.5	62.8	70.2	70.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	61	130	281	605
CNEL:	63	135	292	628

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031) With PAs 2, 4, | Project Name: Westide Annex & NLISP
Road Name: Sierra Hwy. | Job Number: 16126
Road Segment: n/o Avenue A

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,701 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	827 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	92.34%
Medium Trucks:	77.4%	3.8%	18.8%	2.19%
Heavy Trucks:	73.4%	6.8%	19.9%	5.47%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-3.88	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-20.13	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-16.15	-0.29	-1.20	-5.35	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	64.7	60.8	58.8	66.5	66.8
Medium Trucks:	60.8	59.1	52.0	54.2	61.5	61.6
Heavy Trucks:	68.8	66.8	62.5	62.4	69.6	69.8
Vehicle Noise:	71.2	69.3	65.0	64.4	71.8	72.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	77	167	359	774
CNEL:	80	173	373	803

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing | Project Name: Westide Annex & NLISP
Road Name: Sierra Hwy. | Job Number: 16126
Road Segment: s/o Avenue A

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,813 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	743 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-4.24	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-21.30	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-18.40	-0.29	-1.20	-5.35	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	64.3	60.4	58.4	66.1	66.4
Medium Trucks:	59.6	57.9	50.8	53.0	60.3	60.5
Heavy Trucks:	66.5	64.6	60.2	60.2	67.4	67.6
Vehicle Noise:	69.7	67.9	63.6	62.9	70.3	70.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	61	132	285	614
CNEL:	64	137	296	638

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing With PAs 2, 4, 6, 7, and 8 | Project Name: Westide Annex & NLISP
Road Name: Sierra Hwy. | Job Number: 16126
Road Segment: s/o Avenue A

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,684 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	921 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	93.02%
Medium Trucks:	77.4%	3.8%	18.8%	2.00%
Heavy Trucks:	73.4%	6.8%	19.9%	4.98%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-3.38	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-20.06	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-16.10	-0.29	-1.20	-5.35	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:	66.9	65.2	61.3	59.3	67.0	67.3
Medium Trucks:	60.9	59.2	52.1	54.3	61.6	61.7
Heavy Trucks:	68.8	66.9	62.6	62.5	69.7	69.9
Vehicle Noise:	71.4	69.6	65.2	64.6	72.0	72.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	80	172	370	797
CNEL:	83	178	384	827

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031) | Project Name: Westide Annex & NLISP
Road Name: Sierra Hwy. | Job Number: 16126
Road Segment: s/o Avenue A

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,766 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	834 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-3.74	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-20.80	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-17.90	-0.29	-1.20	-5.35	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	64.8	60.9	58.9	66.6	66.9
Medium Trucks:	60.1	58.4	51.3	53.5	60.8	61.0
Heavy Trucks:	67.0	65.1	60.7	60.7	67.9	68.1
Vehicle Noise:	70.2	68.4	64.1	63.4	70.8	71.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	66	143	308	663
CNEL:	69	148	320	689

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031) With PAs 2, 4, | Project Name: Westide Annex & NLISP
Road Name: Sierra Hwy. | Job Number: 16126
Road Segment: s/o Avenue A

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,638 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	1,012 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	93.16%
Medium Trucks:	77.4%	3.8%	18.8%	1.99%
Heavy Trucks:	73.4%	6.8%	19.9%	4.86%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-2.97	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-19.68	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-15.79	-0.29	-1.20	-5.35	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	65.6	61.7	59.7	67.4	67.7
Medium Trucks:	61.2	59.6	52.4	54.7	62.0	62.1
Heavy Trucks:	69.1	67.2	62.9	62.8	70.0	70.2
Vehicle Noise:	71.7	69.9	65.5	64.9	72.3	72.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	84	181	390	841
CNEL:	87	188	405	872

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing | Project Name: Westide Annex & NLISP
Road Name: Sierra Hwy. | Job Number: 16126
Road Segment: n/o Avenue D

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,197 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	780 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-4.04	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-21.09	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-18.20	-0.29	-1.20	-5.35	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	64.5	60.6	58.6	66.3	66.6
Medium Trucks:	59.8	58.1	51.0	53.2	60.5	60.7
Heavy Trucks:	66.7	64.8	60.5	60.4	67.6	67.8
Vehicle Noise:	69.9	68.1	63.8	63.1	70.5	70.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	63	137	294	634
CNEL:	66	142	306	659

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing With PAs 2, 4, 6, 7, and 8 | Project Name: Westide Annex & NLISP
Road Name: Sierra Hwy. | Job Number: 16126
Road Segment: n/o Avenue D

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,068 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	957 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	93.08%
Medium Trucks:	77.4%	3.8%	18.8%	1.99%
Heavy Trucks:	73.4%	6.8%	19.9%	4.93%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-3.21	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-19.90	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-15.97	-0.29	-1.20	-5.35	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	65.4	61.5	59.4	67.1	67.5
Medium Trucks:	61.0	59.3	52.2	54.4	61.7	61.9
Heavy Trucks:	68.9	67.0	62.7	62.6	69.8	70.0
Vehicle Noise:	71.5	69.7	65.3	64.7	72.1	72.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	81	176	378	815
CNEL:	85	182	392	846

Thursday, March 20, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031) | Project Name: Westide Annex & NLISP
Road Name: Sierra Hwy. | Job Number: 16126
Road Segment: n/o Avenue D

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,186 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	874 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-3.54	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-20.60	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-17.70	-0.29	-1.20	-5.35	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	65.0	61.1	59.1	66.8	67.1
Medium Trucks:	60.3	58.6	51.5	53.7	61.0	61.2
Heavy Trucks:	67.2	65.3	60.9	60.9	68.1	68.3
Vehicle Noise:	70.4	68.6	64.3	63.6	71.0	71.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	68	147	318	684
CNEL:	71	153	330	710

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031) With PAs 2, 4, | Project Name: Westide Annex & NLISP
Road Name: Sierra Hwy. | Job Number: 16126
Road Segment: n/o Avenue D

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,057 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	1,052 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	93.21%
Medium Trucks:	77.4%	3.8%	18.8%	1.98%
Heavy Trucks:	73.4%	6.8%	19.9%	4.81%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-2.80	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-19.52	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-15.67	-0.29	-1.20	-5.35	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	65.8	61.9	59.8	67.6	67.9
Medium Trucks:	61.4	59.7	52.6	54.8	62.1	62.2
Heavy Trucks:	69.2	67.3	63.0	62.9	70.1	70.3
Vehicle Noise:	71.9	70.1	65.7	65.1	72.4	72.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	86	185	399	859
CNEL:	89	192	414	892

Thursday, March 20, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing | Project Name: Westide Annex & NLISP
Road Name: Sierra Hwy. | Job Number: 16126
Road Segment: n/o Avenue E

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,409 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	1,085 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-2.60	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-19.66	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-16.76	-0.29	-1.20	-5.35	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:	67.7	66.0	62.1	60.0	67.8	68.1
Medium Trucks:	61.3	59.6	52.5	54.7	62.0	62.1
Heavy Trucks:	68.1	66.2	61.9	61.8	69.0	69.2
Vehicle Noise:	71.4	69.6	65.2	64.5	71.9	72.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	79	170	367	791
CNEL:	82	177	381	821

Thursday, March 20, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing With PAs 2, 4, 6, 7, and 8 | Project Name: Westide Annex & NLISP
Road Name: Sierra Hwy. | Job Number: 16126
Road Segment: n/o Avenue E

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,990 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	1,140 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	94.06%
Medium Trucks:	77.4%	3.8%	18.8%	1.91%
Heavy Trucks:	73.4%	6.8%	19.9%	4.03%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-2.40	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-19.33	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-16.09	-0.29	-1.20	-5.35	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	66.2	62.3	60.2	68.0	68.3
Medium Trucks:	61.6	59.9	52.8	55.0	62.3	62.4
Heavy Trucks:	68.8	66.9	62.6	62.5	69.7	69.9
Vehicle Noise:	71.8	70.0	65.7	65.0	72.4	72.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	85	183	394	848
CNEL:	88	190	409	881

Thursday, March 20, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031) | Project Name: Westide Annex & NLISP
Road Name: Sierra Hwy. | Job Number: 16126
Road Segment: n/o Avenue E

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,791 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	1,216 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-2.10	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-19.16	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-16.26	-0.29	-1.20	-5.35	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	66.5	62.6	60.5	68.3	68.6
Medium Trucks:	61.8	60.1	53.0	55.2	62.5	62.6
Heavy Trucks:	68.6	66.7	62.4	62.3	69.5	69.7
Vehicle Noise:	71.9	70.1	65.7	65.0	72.4	72.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	85	184	396	853
CNEL:	89	191	411	886

Thursday, March 20, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031) With PAs 2, 4, | Project Name: Westide Annex & NLISP
Road Name: Sierra Hwy. | Job Number: 16126
Road Segment: n/o Avenue E

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,373 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	1,272 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	94.11%
Medium Trucks:	77.4%	3.8%	18.8%	1.91%
Heavy Trucks:	73.4%	6.8%	19.9%	3.99%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-1.93	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-18.86	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-15.66	-0.29	-1.20	-5.35	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	66.7	62.7	60.7	68.4	68.7
Medium Trucks:	62.1	60.4	53.2	55.5	62.8	62.9
Heavy Trucks:	69.2	67.3	63.0	62.9	70.1	70.3
Vehicle Noise:	72.3	70.5	66.1	65.4	72.8	73.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	91	196	422	909
CNEL:	94	203	438	944

Thursday, March 20, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing
Road Name: Sierra Hwy.
Road Segment: n/o Avenue F
Project Name: Westide Annex & NLISP
Job Number: 16126

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,119 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	677 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-4.65	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-21.70	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-18.81	-0.29	-1.20	-5.35	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	63.9	60.0	58.0	65.7	66.0
Medium Trucks:	59.2	57.5	50.4	52.6	59.9	60.1
Heavy Trucks:	66.1	64.2	59.8	59.8	67.0	67.2
Vehicle Noise:	69.3	67.5	63.2	62.4	69.9	70.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	58	124	268	577
CNEL:	60	129	278	599

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing With PAs 2, 4, 6, 7, and 8
Road Name: Sierra Hwy.
Road Segment: n/o Avenue F
Project Name: Westide Annex & NLISP
Job Number: 16126

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,715 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	924 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	91.78%
Medium Trucks:	77.4%	3.8%	18.8%	2.18%
Heavy Trucks:	73.4%	6.8%	19.9%	6.04%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-3.43	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-19.66	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-15.24	-0.29	-1.20	-5.35	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	65.2	61.2	59.2	66.9	67.2
Medium Trucks:	61.2	59.6	52.4	54.7	62.0	62.1
Heavy Trucks:	69.7	67.7	63.4	63.3	70.5	70.8
Vehicle Noise:	71.9	70.1	65.7	65.2	72.5	72.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	87	187	402	867
CNEL:	90	194	417	899

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031)
Road Name: Sierra Hwy.
Road Segment: n/o Avenue F
Project Name: Westide Annex & NLISP
Job Number: 16126

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,111 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	771 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-4.08	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-21.14	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-18.24	-0.29	-1.20	-5.35	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	64.5	60.6	58.6	66.3	66.6
Medium Trucks:	59.8	58.1	51.0	53.2	60.5	60.6
Heavy Trucks:	66.7	64.7	60.4	60.3	67.5	67.8
Vehicle Noise:	69.9	68.1	63.7	63.0	70.4	70.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	63	136	292	630
CNEL:	65	141	304	654

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031) With PAs 2, 4,
Road Name: Sierra Hwy.
Road Segment: n/o Avenue F
Project Name: Westide Annex & NLISP
Job Number: 16126

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,708 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	1,018 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	92.03%
Medium Trucks:	77.4%	3.8%	18.8%	2.15%
Heavy Trucks:	73.4%	6.8%	19.9%	5.81%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-2.99	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-19.30	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-14.98	-0.29	-1.20	-5.35	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	65.6	61.7	59.6	67.4	67.7
Medium Trucks:	61.6	59.9	52.8	55.0	62.3	62.5
Heavy Trucks:	69.9	68.0	63.7	63.6	70.8	71.0
Vehicle Noise:	72.2	70.4	66.0	65.5	72.8	73.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	91	196	422	910
CNEL:	94	203	438	944

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing
Road Name: Sierra Hwy.
Road Segment: n/o Avenue G
Project Name: Westide Annex & NLISP
Job Number: 16126

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,402 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	704 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-4.48	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-21.53	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-18.64	-0.29	-1.20	-5.35	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:	65.8	64.1	60.2	58.2	65.9	66.2
Medium Trucks:	59.4	57.7	50.6	52.8	60.1	60.2
Heavy Trucks:	66.3	64.3	60.0	59.9	67.1	67.4
Vehicle Noise:	69.5	67.7	63.3	62.6	70.0	70.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	59	128	275	593
CNEL:	62	133	286	615

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing With PAs 2, 4, 6, 7, and 8
Road Name: Sierra Hwy.
Road Segment: n/o Avenue G
Project Name: Westide Annex & NLISP
Job Number: 16126

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,333 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	983 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	91.29%
Medium Trucks:	77.4%	3.8%	18.8%	2.26%
Heavy Trucks:	73.4%	6.8%	19.9%	6.45%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-3.18	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-19.23	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-14.69	-0.29	-1.20	-5.35	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	65.4	61.5	59.5	67.2	67.5
Medium Trucks:	61.7	60.0	52.9	55.1	62.4	62.5
Heavy Trucks:	70.2	68.3	64.0	63.9	71.1	71.3
Vehicle Noise:	72.3	70.5	66.1	65.6	73.0	73.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	93	200	432	930
CNEL:	96	208	448	964

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031)
Road Name: Sierra Hwy.
Road Segment: n/o Avenue G
Project Name: Westide Annex & NLISP
Job Number: 16126

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,375 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	892 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-3.45	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-20.51	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-17.61	-0.29	-1.20	-5.35	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	65.1	61.2	59.2	66.9	67.2
Medium Trucks:	60.4	58.7	51.6	53.8	61.1	61.3
Heavy Trucks:	67.3	65.4	61.0	61.0	68.2	68.4
Vehicle Noise:	70.5	68.7	64.4	63.6	71.1	71.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	69	149	322	694
CNEL:	72	155	334	720

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031) With PAs 2, 4,
Road Name: Sierra Hwy.
Road Segment: n/o Avenue G
Project Name: Westide Annex & NLISP
Job Number: 16126

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,305 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	1,170 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	91.80%
Medium Trucks:	77.4%	3.8%	18.8%	2.20%
Heavy Trucks:	73.4%	6.8%	19.9%	6.00%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-2.40	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-18.60	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-14.25	-0.29	-1.20	-5.35	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	66.2	62.3	60.2	68.0	68.3
Medium Trucks:	62.3	60.6	53.5	55.7	63.0	63.2
Heavy Trucks:	70.7	68.7	64.4	64.3	71.5	71.7
Vehicle Noise:	72.9	71.1	66.7	66.2	73.5	73.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	101	218	470	1,012
CNEL:	105	226	487	1,050

Thursday, March 20, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing
Road Name: Sierra Hwy.
Road Segment: n/o Avenue H
Project Name: Westide Annex & NLISP
Job Number: 16126

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,761 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	643 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-4.87	-0.31	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	82.40	-21.93	-0.29	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-19.03	-0.29	-1.20	*-5.35*	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	63.7	59.8	57.8	65.5	65.8
Medium Trucks:	59.0	57.3	50.2	52.4	59.7	59.8
Heavy Trucks:	65.9	64.0	59.6	59.5	66.7	67.0
Vehicle Noise:	69.1	67.3	63.0	62.2	69.6	69.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	56	120	259	558
CNEL:	58	125	269	579

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing With PAs 2, 4, 6, 7, and 8
Road Name: Sierra Hwy.
Road Segment: n/o Avenue H
Project Name: Westide Annex & NLISP
Job Number: 16126

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,632 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	821 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	92.84%
Medium Trucks:	77.4%	3.8%	18.8%	2.02%
Heavy Trucks:	73.4%	6.8%	19.9%	5.14%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-3.89	-0.31	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	82.40	-20.52	-0.29	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-16.45	-0.29	-1.20	*-5.35*	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	64.7	60.8	58.7	66.5	66.8
Medium Trucks:	60.4	58.7	51.6	53.8	61.1	61.2
Heavy Trucks:	68.5	66.5	62.2	62.1	69.3	69.5
Vehicle Noise:	70.9	69.1	64.8	64.2	71.5	71.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	75	161	347	748
CNEL:	78	167	360	776

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031)
Road Name: Sierra Hwy.
Road Segment: n/o Avenue H
Project Name: Westide Annex & NLISP
Job Number: 16126

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,249 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	785 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-4.01	-0.31	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	82.40	-21.06	-0.29	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-18.17	-0.29	-1.20	*-5.35*	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	64.6	60.7	58.6	66.3	66.7
Medium Trucks:	59.9	58.2	51.0	53.3	60.6	60.7
Heavy Trucks:	66.7	64.8	60.5	60.4	67.6	67.8
Vehicle Noise:	70.0	68.2	63.8	63.1	70.5	70.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	64	137	296	637
CNEL:	66	142	307	661

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031) With PAs 2, 4,
Road Name: Sierra Hwy.
Road Segment: n/o Avenue H
Project Name: Westide Annex & NLISP
Job Number: 16126

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,121 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	962 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	93.09%
Medium Trucks:	77.4%	3.8%	18.8%	1.99%
Heavy Trucks:	73.4%	6.8%	19.9%	4.92%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-3.19	-0.31	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	82.40	-19.88	-0.29	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-15.95	-0.29	-1.20	*-5.35*	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	65.4	61.5	59.4	67.2	67.5
Medium Trucks:	61.0	59.3	52.2	54.5	61.8	61.9
Heavy Trucks:	68.9	67.0	62.7	62.6	69.8	70.0
Vehicle Noise:	71.5	69.7	65.4	64.7	72.1	72.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	82	176	379	817
CNEL:	85	183	394	848

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing | Project Name: Westide Annex & NLISP
Road Name: Avenue A | Job Number: 16126
Road Segment: w/o Sierra Hwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,346 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	128 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	42.0 feet
Centerline Dist. to Observer:	42.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	38.275
Medium Trucks:	38.043
Heavy Trucks:	38.066

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-11.88	1.64	-1.20	-4.60	0.000	0.000
Medium Trucks:	82.40	-28.94	1.68	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-26.04	1.67	-1.20	-5.53	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:	60.3	58.6	54.7	52.7	60.4	60.7
Medium Trucks:	53.9	52.3	45.1	47.4	54.7	54.8
Heavy Trucks:	60.8	58.9	54.6	54.5	61.7	61.9
Vehicle Noise:	64.0	62.2	57.9	57.2	64.6	64.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	18	39	85	183
CNEL:	19	41	88	190

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing With PAs 2, 4, 6, 7, and 8 | Project Name: Westide Annex & NLISP
Road Name: Avenue A | Job Number: 16126
Road Segment: w/o Sierra Hwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,158 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	205 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	42.0 feet
Centerline Dist. to Observer:	42.0 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:	77.4%	7.9%	14.8%	96.58%
Medium Trucks:	77.4%	3.8%	18.8%	1.16%
Heavy Trucks:	73.4%	6.8%	19.9%	2.26%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	38.275
Medium Trucks:	38.043
Heavy Trucks:	38.066

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-9.74	1.64	-1.20	-4.60	0.000	0.000
Medium Trucks:	82.40	-28.94	1.68	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-26.04	1.67	-1.20	-5.53	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	60.8	56.9	54.8	62.6	62.9
Medium Trucks:	53.9	52.3	45.1	47.4	54.7	54.8
Heavy Trucks:	60.8	58.9	54.6	54.5	61.7	61.9
Vehicle Noise:	65.1	63.3	59.1	58.1	65.5	65.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	21	46	98	212
CNEL:	22	47	102	220

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031) | Project Name: Westide Annex & NLISP
Road Name: Avenue A | Job Number: 16126
Road Segment: w/o Sierra Hwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,468 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	140 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	42.0 feet
Centerline Dist. to Observer:	42.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	38.275
Medium Trucks:	38.043
Heavy Trucks:	38.066

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-11.50	1.64	-1.20	-4.60	0.000	0.000
Medium Trucks:	82.40	-28.56	1.68	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-25.67	1.67	-1.20	-5.53	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:	60.7	59.0	55.1	53.1	60.8	61.1
Medium Trucks:	54.3	52.6	45.5	47.7	55.0	55.2
Heavy Trucks:	61.2	59.3	54.9	54.9	62.1	62.3
Vehicle Noise:	64.4	62.6	58.3	57.6	65.0	65.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	19	42	90	194
CNEL:	20	43	93	201

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031) With PAs 2, 4, | Project Name: Westide Annex & NLISP
Road Name: Avenue A | Job Number: 16126
Road Segment: w/o Sierra Hwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,280 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	217 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	42.0 feet
Centerline Dist. to Observer:	42.0 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:	77.4%	7.9%	14.8%	96.47%
Medium Trucks:	77.4%	3.8%	18.8%	1.20%
Heavy Trucks:	73.4%	6.8%	19.9%	2.33%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	38.275
Medium Trucks:	38.043
Heavy Trucks:	38.066

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-9.50	1.64	-1.20	-4.60	0.000	0.000
Medium Trucks:	82.40	-28.56	1.68	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-25.67	1.67	-1.20	-5.53	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:	62.7	61.0	57.1	55.1	62.8	63.1
Medium Trucks:	54.3	52.6	45.5	47.7	55.0	55.2
Heavy Trucks:	61.2	59.3	54.9	54.9	62.1	62.3
Vehicle Noise:	65.4	63.6	59.4	58.4	65.8	66.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	22	48	103	222
CNEL:	23	50	107	231

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing
Road Name: Avenue D
Road Segment: w/o 20th St. West
Project Name: Westide Annex & NLISP
Job Number: 16126

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,859 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	367 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-7.31	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-24.36	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-21.47	-0.29	-1.20	-5.35	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:	63.0	61.3	57.4	55.3	63.0	63.4
Medium Trucks:	56.6	54.9	47.7	50.0	57.3	57.4
Heavy Trucks:	63.4	61.5	57.2	57.1	64.3	64.5
Vehicle Noise:	66.7	64.9	60.5	59.8	67.2	67.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	38	83	178	384
CNEL:	40	86	185	399

Thursday, March 20, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing With PAs 2, 4, 6, 7, and 8
Road Name: Avenue D
Road Segment: w/o 20th St. West
Project Name: Westide Annex & NLISP
Job Number: 16126

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,999 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	1,141 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	82.13%
Medium Trucks:	77.4%	3.8%	18.8%	3.73%
Heavy Trucks:	73.4%	6.8%	19.9%	14.13%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-2.99	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-16.41	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-10.63	-0.29	-1.20	-5.35	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	65.6	61.7	59.6	67.4	67.7
Medium Trucks:	64.5	62.8	55.7	57.9	65.2	65.3
Heavy Trucks:	74.3	72.4	68.0	67.9	75.1	75.4
Vehicle Noise:	75.4	73.6	69.1	68.9	76.2	76.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	152	328	707	1,522
CNEL:	158	340	732	1,576

Thursday, March 20, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031)
Road Name: Avenue D
Road Segment: w/o 20th St. West
Project Name: Westide Annex & NLISP
Job Number: 16126

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,416 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	420 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-6.72	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-23.78	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-20.88	-0.29	-1.20	-5.35	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	61.9	58.0	55.9	63.6	63.9
Medium Trucks:	57.1	55.5	48.3	50.6	57.9	58.0
Heavy Trucks:	64.0	62.1	57.8	57.7	64.9	65.1
Vehicle Noise:	67.2	65.5	61.1	60.4	67.8	68.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	42	90	195	420
CNEL:	44	94	202	436

Thursday, March 20, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031) With PAs 2, 4,
Road Name: Avenue D
Road Segment: w/o 20th St. West
Project Name: Westide Annex & NLISP
Job Number: 16126

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,556 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	1,194 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	82.68%
Medium Trucks:	77.4%	3.8%	18.8%	3.65%
Heavy Trucks:	73.4%	6.8%	19.9%	13.67%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-2.76	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-16.31	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-10.58	-0.29	-1.20	-5.35	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	65.8	61.9	59.9	67.6	67.9
Medium Trucks:	64.6	62.9	55.8	58.0	65.3	65.4
Heavy Trucks:	74.3	72.4	68.1	68.0	75.2	75.4
Vehicle Noise:	75.5	73.6	69.2	69.0	76.3	76.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	154	332	715	1,541
CNEL:	160	344	740	1,595

Thursday, March 20, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing | Project Name: Westide Annex & NLISP
Road Name: Avenue D | Job Number: 16126
Road Segment: e/o 20th St. West

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,349 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	318 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-7.92	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-24.98	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-22.08	-0.29	-1.20	-5.35	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:	62.3	60.7	56.8	54.7	62.4	62.7
Medium Trucks:	55.9	54.3	47.1	49.4	56.7	56.8
Heavy Trucks:	62.8	60.9	56.6	56.5	63.7	63.9
Vehicle Noise:	66.0	64.2	59.9	59.2	66.6	66.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	35	75	162	349
CNEL:	36	78	168	363

Thursday, March 20, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing With PAs 2, 4, 6, 7, and 8 | Project Name: Westide Annex & NLISP
Road Name: Avenue D | Job Number: 16126
Road Segment: e/o 20th St. West

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,489 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	1,093 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	81.58%
Medium Trucks:	77.4%	3.8%	18.8%	3.82%
Heavy Trucks:	73.4%	6.8%	19.9%	14.60%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-3.21	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-16.51	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-10.68	-0.29	-1.20	-5.35	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	65.4	61.5	59.4	67.1	67.5
Medium Trucks:	64.4	62.7	55.6	57.8	65.1	65.3
Heavy Trucks:	74.2	72.3	68.0	67.9	75.1	75.3
Vehicle Noise:	75.4	73.5	69.0	68.8	76.1	76.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	151	324	699	1,505
CNEL:	156	336	723	1,558

Thursday, March 20, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031) | Project Name: Westide Annex & NLISP
Road Name: Avenue D | Job Number: 16126
Road Segment: e/o 20th St. West

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,859 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	367 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-7.31	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-24.36	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-21.47	-0.29	-1.20	-5.35	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:	63.0	61.3	57.4	55.3	63.0	63.4
Medium Trucks:	56.6	54.9	47.7	50.0	57.3	57.4
Heavy Trucks:	63.4	61.5	57.2	57.1	64.3	64.5
Vehicle Noise:	66.7	64.9	60.5	59.8	67.2	67.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	38	83	178	384
CNEL:	40	86	185	399

Thursday, March 20, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031) With PAs 2, 4, | Project Name: Westide Annex & NLISP
Road Name: Avenue D | Job Number: 16126
Road Segment: e/o 20th St. West

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,999 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	1,141 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	82.13%
Medium Trucks:	77.4%	3.8%	18.8%	3.73%
Heavy Trucks:	73.4%	6.8%	19.9%	14.13%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-2.99	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-16.41	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-10.63	-0.29	-1.20	-5.35	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	65.6	61.7	59.6	67.4	67.7
Medium Trucks:	64.5	62.8	55.7	57.9	65.2	65.3
Heavy Trucks:	74.3	72.4	68.0	67.9	75.1	75.4
Vehicle Noise:	75.4	73.6	69.1	68.9	76.2	76.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	152	328	707	1,522
CNEL:	158	340	732	1,576

Thursday, March 20, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing
Road Name: Avenue D
Road Segment: w/o Sierra Hwy.
Project Name: Westide Annex & NLISP
Job Number: 16126

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,349 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	318 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-7.92	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-24.98	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-22.08	-0.29	-1.20	-5.35	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:	62.3	60.7	56.8	54.7	62.4	62.7
Medium Trucks:	55.9	54.3	47.1	49.4	56.7	56.8
Heavy Trucks:	62.8	60.9	56.6	56.5	63.7	63.9
Vehicle Noise:	66.0	64.2	59.9	59.2	66.6	66.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	35	75	162	349
CNEL:	36	78	168	363

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing With PAs 2, 4, 6, 7, and 8
Road Name: Avenue D
Road Segment: w/o Sierra Hwy.
Project Name: Westide Annex & NLISP
Job Number: 16126

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	4,799 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	456 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	89.46%
Medium Trucks:	77.4%	3.8%	18.8%	2.61%
Heavy Trucks:	73.4%	6.8%	19.9%	7.93%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-6.60	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-21.96	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-17.12	-0.29	-1.20	-5.35	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:	63.7	62.0	58.1	56.0	63.8	64.1
Medium Trucks:	59.0	57.3	50.2	52.4	59.7	59.8
Heavy Trucks:	67.8	65.9	61.5	61.4	68.7	68.9
Vehicle Noise:	69.6	67.8	63.4	62.9	70.3	70.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	61	132	285	615
CNEL:	64	137	296	637

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031)
Road Name: Avenue D
Road Segment: w/o Sierra Hwy.
Project Name: Westide Annex & NLISP
Job Number: 16126

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,859 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	367 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-7.31	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-24.36	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-21.47	-0.29	-1.20	-5.35	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:	63.0	61.3	57.4	55.3	63.0	63.4
Medium Trucks:	56.6	54.9	47.7	50.0	57.3	57.4
Heavy Trucks:	63.4	61.5	57.2	57.1	64.3	64.5
Vehicle Noise:	66.7	64.9	60.5	59.8	67.2	67.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	38	83	178	384
CNEL:	40	86	185	399

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031) With PAs 2, 4,
Road Name: Avenue D
Road Segment: w/o Sierra Hwy.
Project Name: Westide Annex & NLISP
Job Number: 16126

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	5,310 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	505 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	58 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	59.0 feet
Centerline Dist. to Observer:	59.0 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:	77.4%	7.9%	14.8%	89.95%
Medium Trucks:	77.4%	3.8%	18.8%	2.53%
Heavy Trucks:	73.4%	6.8%	19.9%	7.52%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	51.624
Medium Trucks:	51.452
Heavy Trucks:	51.469

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-6.14	-0.31	-1.20	-4.69	0.000	0.000
Medium Trucks:	82.40	-21.64	-0.29	-1.20	-4.88	0.000	0.000
Heavy Trucks:	86.40	-16.92	-0.29	-1.20	-5.35	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	62.4	58.5	56.5	64.2	64.5
Medium Trucks:	59.3	57.6	50.5	52.7	60.0	60.1
Heavy Trucks:	68.0	66.1	61.7	61.7	68.9	69.1
Vehicle Noise:	69.9	68.0	63.6	63.2	70.5	70.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	64	138	298	641
CNEL:	66	143	309	665

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing | Project Name: Westide Annex & NLISP
Road Name: Avenue E | Job Number: 16126
Road Segment: w/o Sierra Hwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	202 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	19 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	42.0 feet
Centerline Dist. to Observer:	42.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	38.275
Medium Trucks:	38.043
Heavy Trucks:	38.066

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-20.12	1.64	-1.20	-4.60	0.000	0.000
Medium Trucks:	82.40	-37.17	1.68	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-34.28	1.67	-1.20	-5.53	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:	52.1	50.4	46.5	44.5	52.2	52.5
Medium Trucks:	45.7	44.0	36.9	39.1	46.4	46.6
Heavy Trucks:	52.6	50.7	46.3	46.3	53.5	53.7
Vehicle Noise:	55.8	54.0	49.7	48.9	56.3	56.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	11	24	52
CNEL:	5	12	25	54

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing With PAs 2, 4, 6, 7, and 8 | Project Name: Westide Annex & NLISP
Road Name: Avenue E | Job Number: 16126
Road Segment: w/o Sierra Hwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,217 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	211 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	42.0 feet
Centerline Dist. to Observer:	42.0 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:	77.4%	7.9%	14.8%	84.98%
Medium Trucks:	77.4%	3.8%	18.8%	3.00%
Heavy Trucks:	73.4%	6.8%	19.9%	12.03%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	38.275
Medium Trucks:	38.043
Heavy Trucks:	38.066

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-10.18	1.64	-1.20	-4.60	0.000	0.000
Medium Trucks:	82.40	-24.70	1.68	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-18.67	1.67	-1.20	-5.53	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:	62.0	60.4	56.4	54.4	62.1	62.4
Medium Trucks:	58.2	56.5	49.4	51.6	58.9	59.0
Heavy Trucks:	68.2	66.3	61.9	61.9	69.1	69.3
Vehicle Noise:	69.5	67.6	63.2	62.9	70.2	70.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	43	93	201	433
CNEL:	45	97	208	449

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031) | Project Name: Westide Annex & NLISP
Road Name: Avenue E | Job Number: 16126
Road Segment: w/o Sierra Hwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	220 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	21 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	42.0 feet
Centerline Dist. to Observer:	42.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	38.275
Medium Trucks:	38.043
Heavy Trucks:	38.066

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-19.74	1.64	-1.20	-4.60	0.000	0.000
Medium Trucks:	82.40	-36.80	1.68	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-33.90	1.67	-1.20	-5.53	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:	52.5	50.8	46.9	44.8	52.6	52.9
Medium Trucks:	46.1	44.4	37.3	39.5	46.8	46.9
Heavy Trucks:	53.0	51.0	46.7	46.6	53.8	54.1
Vehicle Noise:	56.2	54.4	50.0	49.3	56.7	57.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	5	12	25	55
CNEL:	6	12	26	57

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031) With PAs 2, 4, | Project Name: Westide Annex & NLISP
Road Name: Avenue E | Job Number: 16126
Road Segment: w/o Sierra Hwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,236 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	213 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	42.0 feet
Centerline Dist. to Observer:	42.0 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:	77.4%	7.9%	14.8%	85.06%
Medium Trucks:	77.4%	3.8%	18.8%	2.99%
Heavy Trucks:	73.4%	6.8%	19.9%	11.96%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	38.275
Medium Trucks:	38.043
Heavy Trucks:	38.066

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-10.14	1.64	-1.20	-4.60	0.000	0.000
Medium Trucks:	82.40	-24.68	1.68	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-18.66	1.67	-1.20	-5.53	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:	62.1	60.4	56.5	54.4	62.2	62.5
Medium Trucks:	58.2	56.5	49.4	51.6	58.9	59.0
Heavy Trucks:	68.2	66.3	62.0	61.9	69.1	69.3
Vehicle Noise:	69.5	67.6	63.2	62.9	70.2	70.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	43	94	202	435
CNEL:	45	97	209	450

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing | Project Name: Westide Annex & NLISP
Road Name: Avenue F | Job Number: 16126
Road Segment: w/o 20th St. West

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,586 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	341 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	42.0 feet
Centerline Dist. to Observer:	42.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	38.275
Medium Trucks:	38.043
Heavy Trucks:	38.066

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-7.63	1.64	-1.20	-4.60	0.000	0.000
Medium Trucks:	82.40	-24.68	1.68	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-21.79	1.67	-1.20	-5.53	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:	64.6	62.9	59.0	57.0	64.7	65.0
Medium Trucks:	58.2	56.5	49.4	51.6	58.9	59.0
Heavy Trucks:	65.1	63.2	58.8	58.7	66.0	66.2
Vehicle Noise:	68.3	66.5	62.2	61.4	68.8	69.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	35	76	163	351
CNEL:	36	79	169	365

Thursday, March 20, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing With PAs 2, 4, 6, 7, and 8 | Project Name: Westide Annex & NLISP
Road Name: Avenue F | Job Number: 16126
Road Segment: w/o 20th St. West

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,826 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	1,125 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	42.0 feet
Centerline Dist. to Observer:	42.0 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:	77.4%	7.9%	14.8%	79.17%
Medium Trucks:	77.4%	3.8%	18.8%	4.30%
Heavy Trucks:	73.4%	6.8%	19.9%	16.54%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	38.275
Medium Trucks:	38.043
Heavy Trucks:	38.066

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-3.21	1.64	-1.20	-4.60	0.000	0.000
Medium Trucks:	82.40	-15.87	1.68	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-10.01	1.67	-1.20	-5.53	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	67.3	63.4	61.4	69.1	69.4
Medium Trucks:	67.0	65.3	58.2	60.4	67.7	67.9
Heavy Trucks:	76.9	74.9	70.6	70.5	77.7	77.9
Vehicle Noise:	77.9	76.0	71.6	71.4	78.7	78.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	158	341	736	1,585
CNEL:	164	353	761	1,640

Thursday, March 20, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031) | Project Name: Westide Annex & NLISP
Road Name: Avenue F | Job Number: 16126
Road Segment: w/o 20th St. West

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,157 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	681 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	42.0 feet
Centerline Dist. to Observer:	42.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	38.275
Medium Trucks:	38.043
Heavy Trucks:	38.066

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-4.62	1.64	-1.20	-4.60	0.000	0.000
Medium Trucks:	82.40	-21.68	1.68	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-18.79	1.67	-1.20	-5.53	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	65.9	62.0	60.0	67.7	68.0
Medium Trucks:	61.2	59.5	52.4	54.6	61.9	62.0
Heavy Trucks:	68.1	66.2	61.8	61.7	69.0	69.2
Vehicle Noise:	71.3	69.5	65.2	64.4	71.8	72.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	56	120	259	557
CNEL:	58	125	269	578

Thursday, March 20, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031) With PAs 2, 4, | Project Name: Westide Annex & NLISP
Road Name: Avenue F | Job Number: 16126
Road Segment: w/o 20th St. West

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,397 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	1,464 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	42.0 feet
Centerline Dist. to Observer:	42.0 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:	77.4%	7.9%	14.8%	82.73%
Medium Trucks:	77.4%	3.8%	18.8%	3.73%
Heavy Trucks:	73.4%	6.8%	19.9%	13.54%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	38.275
Medium Trucks:	38.043
Heavy Trucks:	38.066

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-1.88	1.64	-1.20	-4.60	0.000	0.000
Medium Trucks:	82.40	-15.33	1.68	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-9.74	1.67	-1.20	-5.53	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	68.7	64.7	62.7	70.4	70.7
Medium Trucks:	67.5	65.9	58.7	61.0	68.3	68.4
Heavy Trucks:	77.1	75.2	70.9	70.8	78.0	78.2
Vehicle Noise:	78.3	76.5	72.0	71.8	79.1	79.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	169	365	786	1,693
CNEL:	175	378	813	1,752

Thursday, March 20, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing | Project Name: Westide Annex & NLISP
Road Name: Avenue F | Job Number: 16126
Road Segment: e/o 20th St. West

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,330 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	127 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	42.0 feet
Centerline Dist. to Observer:	42.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	38.275
Medium Trucks:	38.043
Heavy Trucks:	38.066

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-11.93	1.64	-1.20	-4.60	0.000	0.000
Medium Trucks:	82.40	-28.99	1.68	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-26.09	1.67	-1.20	-5.53	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:	60.3	58.6	54.7	52.7	60.4	60.7
Medium Trucks:	53.9	52.2	45.1	47.3	54.6	54.7
Heavy Trucks:	60.8	58.9	54.5	54.4	61.6	61.9
Vehicle Noise:	64.0	62.2	57.9	57.1	64.5	64.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	18	39	84	181
CNEL:	19	41	87	188

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing With PAs 2, 4, 6, 7, and 8 | Project Name: Westide Annex & NLISP
Road Name: Avenue F | Job Number: 16126
Road Segment: e/o 20th St. West

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,508 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	619 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	42.0 feet
Centerline Dist. to Observer:	42.0 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:	77.4%	7.9%	14.8%	76.41%
Medium Trucks:	77.4%	3.8%	18.8%	4.76%
Heavy Trucks:	73.4%	6.8%	19.9%	18.83%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	38.275
Medium Trucks:	38.043
Heavy Trucks:	38.066

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-5.96	1.64	-1.20	-4.60	0.000	0.000
Medium Trucks:	82.40	-18.02	1.68	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-12.04	1.67	-1.20	-5.53	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	64.6	60.7	58.6	66.3	66.6
Medium Trucks:	64.9	63.2	56.1	58.3	65.6	65.7
Heavy Trucks:	74.8	72.9	68.6	68.5	75.7	75.9
Vehicle Noise:	75.8	73.9	69.4	69.3	76.5	76.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	115	247	532	1,146
CNEL:	119	255	550	1,185

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031) | Project Name: Westide Annex & NLISP
Road Name: Avenue F | Job Number: 16126
Road Segment: e/o 20th St. West

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,049 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	195 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	42.0 feet
Centerline Dist. to Observer:	42.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	38.275
Medium Trucks:	38.043
Heavy Trucks:	38.066

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-10.06	1.64	-1.20	-4.60	0.000	0.000
Medium Trucks:	82.40	-27.11	1.68	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-24.22	1.67	-1.20	-5.53	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:	62.2	60.5	56.6	54.5	62.2	62.6
Medium Trucks:	55.8	54.1	47.0	49.2	56.5	56.6
Heavy Trucks:	62.7	60.7	56.4	56.3	63.5	63.7
Vehicle Noise:	65.9	64.1	59.7	59.0	66.4	66.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	24	52	112	242
CNEL:	25	54	117	251

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031) With PAs 2, 4, | Project Name: Westide Annex & NLISP
Road Name: Avenue F | Job Number: 16126
Road Segment: e/o 20th St. West

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,227 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	687 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	42.0 feet
Centerline Dist. to Observer:	42.0 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:	77.4%	7.9%	14.8%	78.21%
Medium Trucks:	77.4%	3.8%	18.8%	4.47%
Heavy Trucks:	73.4%	6.8%	19.9%	17.32%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	38.275
Medium Trucks:	38.043
Heavy Trucks:	38.066

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-5.41	1.64	-1.20	-4.60	0.000	0.000
Medium Trucks:	82.40	-17.84	1.68	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-11.95	1.67	-1.20	-5.53	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	65.1	61.2	59.2	66.9	67.2
Medium Trucks:	65.0	63.4	56.2	58.5	65.8	65.9
Heavy Trucks:	74.9	73.0	68.7	68.6	75.8	76.0
Vehicle Noise:	75.9	74.0	69.6	69.4	76.7	76.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	117	252	544	1,171
CNEL:	121	261	563	1,212

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing
Road Name: Avenue F
Road Segment: w/o Sierra Hwy.
Project Name: Westide Annex & NLISP
Job Number: 16126

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,330 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	127 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	42.0 feet
Centerline Dist. to Observer:	42.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	38.275
Medium Trucks:	38.043
Heavy Trucks:	38.066

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-11.93	1.64	-1.20	-4.60	0.000	0.000
Medium Trucks:	82.40	-28.99	1.68	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-26.09	1.67	-1.20	-5.53	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:	60.3	58.6	54.7	52.7	60.4	60.7
Medium Trucks:	53.9	52.2	45.1	47.3	54.6	54.7
Heavy Trucks:	60.8	58.9	54.5	54.4	61.6	61.9
Vehicle Noise:	64.0	62.2	57.9	57.1	64.5	64.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	18	39	84	181
CNEL:	19	41	87	188

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing With PAs 2, 4, 6, 7, and 8
Road Name: Avenue F
Road Segment: w/o Sierra Hwy.
Project Name: Westide Annex & NLISP
Job Number: 16126

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,194 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	209 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	42.0 feet
Centerline Dist. to Observer:	42.0 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:	77.4%	7.9%	14.8%	91.18%
Medium Trucks:	77.4%	3.8%	18.8%	2.20%
Heavy Trucks:	73.4%	6.8%	19.9%	6.62%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	38.275
Medium Trucks:	38.043
Heavy Trucks:	38.066

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-9.92	1.64	-1.20	-4.60	0.000	0.000
Medium Trucks:	82.40	-26.10	1.68	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-21.31	1.67	-1.20	-5.53	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:	62.3	60.6	56.7	54.7	62.4	62.7
Medium Trucks:	56.8	55.1	48.0	50.2	57.5	57.6
Heavy Trucks:	65.6	63.6	59.3	59.2	66.4	66.7
Vehicle Noise:	67.6	65.8	61.4	60.9	68.3	68.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	32	69	149	321
CNEL:	33	72	155	333

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031)
Road Name: Avenue F
Road Segment: w/o Sierra Hwy.
Project Name: Westide Annex & NLISP
Job Number: 16126

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	2,403 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	229 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	42.0 feet
Centerline Dist. to Observer:	42.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	38.275
Medium Trucks:	38.043
Heavy Trucks:	38.066

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-9.36	1.64	-1.20	-4.60	0.000	0.000
Medium Trucks:	82.40	-26.42	1.68	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-23.53	1.67	-1.20	-5.53	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	61.2	57.3	55.2	62.9	63.2
Medium Trucks:	56.5	54.8	47.7	49.9	57.2	57.3
Heavy Trucks:	63.3	61.4	57.1	57.0	64.2	64.4
Vehicle Noise:	66.6	64.8	60.4	59.7	67.1	67.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	27	58	125	269
CNEL:	28	60	130	279

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031) With PAs 2, 4,
Road Name: Avenue F
Road Segment: w/o Sierra Hwy.
Project Name: Westide Annex & NLISP
Job Number: 16126

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,267 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	311 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	42.0 feet
Centerline Dist. to Observer:	42.0 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:	77.4%	7.9%	14.8%	92.28%
Medium Trucks:	77.4%	3.8%	18.8%	2.09%
Heavy Trucks:	73.4%	6.8%	19.9%	5.64%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	38.275
Medium Trucks:	38.043
Heavy Trucks:	38.066

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-8.14	1.64	-1.20	-4.60	0.000	0.000
Medium Trucks:	82.40	-24.59	1.68	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-20.28	1.67	-1.20	-5.53	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	62.4	58.5	56.4	64.2	64.5
Medium Trucks:	58.3	56.6	49.5	51.7	59.0	59.1
Heavy Trucks:	66.6	64.7	60.3	60.3	67.5	67.7
Vehicle Noise:	68.9	67.1	62.7	62.2	69.5	69.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	39	84	182	391
CNEL:	41	87	188	406

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing | Project Name: Westide Annex & NLISP
Road Name: Avenue G | Job Number: 16126
Road Segment: w/o Sierra Hwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,218 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	306 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	42.0 feet
Centerline Dist. to Observer:	42.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	38.275
Medium Trucks:	38.043
Heavy Trucks:	38.066

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-8.10	1.64	-1.20	-4.60	0.000	0.000
Medium Trucks:	82.40	-25.15	1.68	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-22.26	1.67	-1.20	-5.53	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	62.4	58.5	56.5	64.2	64.5
Medium Trucks:	57.7	56.0	48.9	51.1	58.4	58.6
Heavy Trucks:	64.6	62.7	58.4	58.3	65.5	65.7
Vehicle Noise:	67.8	66.0	61.7	61.0	68.4	68.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	33	70	152	327
CNEL:	34	73	158	339

Thursday, March 20, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Existing With PAs 2, 4, 6, 7, and 8 | Project Name: Westide Annex & NLISP
Road Name: Avenue G | Job Number: 16126
Road Segment: w/o Sierra Hwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,218 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	306 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	42.0 feet
Centerline Dist. to Observer:	42.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	38.275
Medium Trucks:	38.043
Heavy Trucks:	38.066

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-8.10	1.64	-1.20	-4.60	0.000	0.000
Medium Trucks:	82.40	-25.15	1.68	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-22.26	1.67	-1.20	-5.53	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	62.4	58.5	56.5	64.2	64.5
Medium Trucks:	57.7	56.0	48.9	51.1	58.4	58.6
Heavy Trucks:	64.6	62.7	58.4	58.3	65.5	65.7
Vehicle Noise:	67.8	66.0	61.7	61.0	68.4	68.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	33	70	152	327
CNEL:	34	73	158	339

Thursday, March 20, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031) | Project Name: Westide Annex & NLISP
Road Name: Avenue G | Job Number: 16126
Road Segment: w/o Sierra Hwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,562 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	339 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	42.0 feet
Centerline Dist. to Observer:	42.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	38.275
Medium Trucks:	38.043
Heavy Trucks:	38.066

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-7.66	1.64	-1.20	-4.60	0.000	0.000
Medium Trucks:	82.40	-24.71	1.68	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-21.82	1.67	-1.20	-5.53	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:	64.6	62.9	59.0	56.9	64.6	65.0
Medium Trucks:	58.2	56.5	49.4	51.6	58.9	59.0
Heavy Trucks:	65.1	63.1	58.8	58.7	65.9	66.1
Vehicle Noise:	68.3	66.5	62.1	61.4	68.8	69.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	35	75	162	350
CNEL:	36	78	169	363

Thursday, March 20, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: Background (2031) With PAs 2, 4, | Project Name: Westide Annex & NLISP
Road Name: Avenue G | Job Number: 16126
Road Segment: w/o Sierra Hwy.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,562 vehicles
Peak Hour Percentage:	9.51%
Peak Hour Volume:	339 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	36 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	42.0 feet
Centerline Dist. to Observer:	42.0 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:	77.4%	7.9%	14.8%	94.51%
Medium Trucks:	77.4%	3.8%	18.8%	1.86%
Heavy Trucks:	73.4%	6.8%	19.9%	3.63%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	Grade Adjustment:	0.0

Lane Equivalent Distance (in feet)

Autos:	38.275
Medium Trucks:	38.043
Heavy Trucks:	38.066

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	71.78	-7.66	1.64	-1.20	-4.60	0.000	0.000
Medium Trucks:	82.40	-24.71	1.68	-1.20	-4.87	0.000	0.000
Heavy Trucks:	86.40	-21.82	1.67	-1.20	-5.53	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:	64.6	62.9	59.0	56.9	64.6	65.0
Medium Trucks:	58.2	56.5	49.4	51.6	58.9	59.0
Heavy Trucks:	65.1	63.1	58.8	58.7	65.9	66.1
Vehicle Noise:	68.3	66.5	62.1	61.4	68.8	69.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	35	75	162	350
CNEL:	36	78	169	363

Thursday, March 20, 2025

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APPENDIX 9.1:

OPERATIONAL NOISE CALCULATIONS

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15951 - Bell Terminal

CadnaA Noise Prediction Model: 15951-07 Rail.cna
Date: 10.01.25
Analyst: B. Lawson

Calculation Configuration

Configuration	
Parameter	**Value**
General	
Max. Error (dB)	0.00
Max. Search Radius (ft)	6561.70
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (ft)	3280.80
Min. Length of Section (ft)	3.30
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
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	328.08
Search Radius Rcvr	328.08
Max. Distance Source - Rcvr	3280.84 3280.84
Min. Distance Rvcr - Reflector	3.28 3.28
Min. Distance Source - Reflector	0.33
Industrial (ISO 9613 (1996))	
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 (°F)	50
rel. Humidity (%)	70
Ground Absorption G	0.50
Wind Speed for Dir. (mph)	6.7
Roads (TNM)	
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	56.2	56.2	62.9	55.0	45.0	0.0				5.00	r	6509964.67	1818483.79	5.00
RECEIVERS		R2	54.9	54.9	61.5	55.0	45.0	0.0				5.00	r	6510095.79	1818244.51	5.00
RECEIVERS		R3	53.3	53.3	60.0	55.0	45.0	0.0				5.00	r	6510569.61	1818134.08	5.00
RECEIVERS		R4	54.4	54.4	61.1	55.0	45.0	0.0				5.00	r	6510720.35	1818088.80	5.00
RECEIVERS		R5	57.1	57.1	63.8	55.0	45.0	0.0				5.00	r	6507647.87	1818767.61	5.00
RECEIVERS		R6	40.9	40.9	47.6	55.0	45.0	0.0				5.00	r	6507169.48	1819375.66	5.00

Point Source(s)

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night			X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(ft)		(ft)	(ft)	(ft)
POINTSOURCE		RAILOFF01	119.9	119.9	119.9	Lw	119.9					30.00	r	6508497.28	1820727.57	30.00
POINTSOURCE		RAILOFF02	119.9	119.9	119.9	Lw	119.9					30.00	r	6508545.68	1820708.21	30.00
POINTSOURCE		LOAD01	113.0	113.0	113.0	Lw	113					10.00	r	6508519.23	1820102.27	10.00
POINTSOURCE		LOAD02	113.0	113.0	113.0	Lw	113					10.00	r	6508531.38	1820077.96	10.00
POINTSOURCE		LOCOIDLE	104.6	104.6	104.6	Lw	104.6					10.00	r	6511365.42	1817928.52	10.00

Line Source(s)

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Operating Time			Moving Pt. Src				Height	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	Number			Speed		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	Day	Evening	Night	(mph)	(ft)	
LINESOURCE		HAUL01	101.3	101.3	101.3	72.4	72.4	72.4	Lw	101.3									10	r
CONVEYOR		CON01	111.2	111.2	111.2	91.1	91.1	91.1	Lw	111.2									30	r
CONVEYOR		CON02	111.2	111.2	111.2	89.9	89.9	89.9	Lw	111.2									30	r

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Operating Time			Moving Pt. Src				Height	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	Number			Speed		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	Day	Evening	Night	(mph)	(ft)	
CONVEYOR		CON03	111.2	111.2	111.2	91.9	91.9	91.9	Lw	111.2									30	r
CONVEYOR		CON04	111.2	111.2	111.2	90.6	90.6	90.6	Lw	111.2									30	r
BNSF		BNSF	107.9	107.9	107.9	73.7	73.7	73.7	PWL-Pt	113.7					1.0	1.0	1.0	6.2	10	r

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
LINESOURCE	HAUL01	10.00	r			6508841.67	1819850.27	10.00	0.00
						6508677.97	1819915.76	10.00	0.00
						6508660.37	1819929.18	10.00	0.00
						6508644.31	1819944.43	10.00	0.00
						6508630.00	1819961.33	10.00	0.00
						6508617.60	1819979.67	10.00	0.00
						6508607.25	1819999.24	10.00	0.00
						6508512.17	1820180.11	10.00	0.00
						6508435.65	1820282.14	10.00	0.00
						6508344.05	1820409.68	10.00	0.00
						6508327.63	1820438.20	10.00	0.00
						6508313.25	1820467.81	10.00	0.00
						6508300.98	1820498.35	10.00	0.00
						6508290.90	1820529.67	10.00	0.00
						6508283.04	1820561.63	10.00	0.00
						6508277.45	1820594.07	10.00	0.00
						6508274.15	1820626.81	10.00	0.00
						6508273.16	1820659.71	10.00	0.00
						6508274.48	1820692.59	10.00	0.00
						6508291.33	1820738.59	10.00	0.00
						6508309.27	1820784.19	10.00	0.00
						6508307.90	1820792.82	10.00	0.00
						6508305.07	1820801.08	10.00	0.00
						6508300.87	1820808.75	10.00	0.00
						6508295.42	1820815.57	10.00	0.00
						6508288.88	1820821.37	10.00	0.00
						6508281.45	1820825.96	10.00	0.00
						6508273.34	1820829.20	10.00	0.00
						6508266.56	1820831.17	10.00	0.00
						6508259.55	1820832.01	10.00	0.00
						6508252.50	1820831.71	10.00	0.00
						6508245.60	1820830.26	10.00	0.00
						6508239.01	1820827.71	10.00	0.00
						6508232.93	1820824.13	10.00	0.00
						6508227.52	1820819.61	10.00	0.00
						6508222.91	1820814.26	10.00	0.00
						6508219.22	1820808.25	10.00	0.00
						6508216.56	1820801.71	10.00	0.00
						6508215.00	1820794.83	10.00	0.00
						6508217.61	1820734.93	10.00	0.00
						6508220.26	1820706.87	10.00	0.00
						6508224.78	1820679.05	10.00	0.00
						6508231.15	1820651.60	10.00	0.00
						6508261.88	1820519.31	10.00	0.00
						6508273.17	1820486.20	10.00	0.00
						6508286.59	1820453.91	10.00	0.00
						6508302.08	1820422.55	10.00	0.00
						6508319.59	1820392.27	10.00	0.00
						6508339.02	1820363.20	10.00	0.00
						6508360.31	1820335.45	10.00	0.00
						6508419.03	1820257.29	10.00	0.00
						6508478.54	1820179.72	10.00	0.00
						6508521.25	1820102.64	10.00	0.00
						6508586.36	1819972.43	10.00	0.00
						6508602.21	1819946.45	10.00	0.00
						6508620.21	1819921.91	10.00	0.00
						6508648.34	1819901.60	10.00	0.00
						6508832.37	1819827.47	10.00	0.00
CONVEYOR	CON01	30.00	r			6508953.16	1820389.80	30.00	0.00
						6508767.78	1820409.75	30.00	0.00
						6508627.96	1820463.52	30.00	0.00
CONVEYOR	CON02	30.00	r			6508767.78	1820409.75	30.00	0.00
						6508669.91	1820181.73	30.00	0.00
						6508863.20	1820167.02	30.00	0.00
CONVEYOR	CON03	30.00	r			6508786.85	1819977.91	30.00	0.00
						6508530.10	1820084.94	30.00	0.00
CONVEYOR	CON04	30.00	r			6508487.07	1820703.37	30.00	0.00
						6508626.89	1820647.44	30.00	0.00
						6508553.75	1820593.66	30.00	0.00
						6508419.31	1820558.17	30.00	0.00

Name	ID	Height			Coordinates			
		Begin		End	x	y	z	Ground
		(ft)		(ft)	(ft)	(ft)	(ft)	(ft)
BNSF	BNSF	10.00	r		6510278.34	1820043.67	10.00	0.00
					6508796.57	1820643.93	10.00	0.00
					6508752.10	1820652.69	10.00	0.00
					6508708.13	1820663.65	10.00	0.00
					6508664.75	1820676.81	10.00	0.00
					6508622.09	1820692.11	10.00	0.00
					6508529.78	1820729.55	10.00	0.00
					6508437.20	1820766.33	10.00	0.00
					6508389.77	1820797.85	10.00	0.00
					6508341.15	1820827.49	10.00	0.00
					6508291.39	1820855.19	10.00	0.00
					6508240.58	1820880.91	10.00	0.00
					6508207.11	1820893.35	10.00	0.00
					6508172.91	1820903.62	10.00	0.00
					6508138.12	1820911.67	10.00	0.00
					6508102.89	1820917.46	10.00	0.00
					6508067.35	1820920.99	10.00	0.00
					6508031.66	1820922.23	10.00	0.00
					6507995.97	1820921.18	10.00	0.00
					6507960.42	1820917.84	10.00	0.00
					6507925.15	1820912.22	10.00	0.00
					6507890.32	1820904.35	10.00	0.00
					6507853.97	1820892.41	10.00	0.00
					6507818.50	1820878.06	10.00	0.00
					6507784.07	1820861.37	10.00	0.00
					6507750.84	1820842.40	10.00	0.00
					6507718.96	1820821.24	10.00	0.00
					6507688.56	1820797.99	10.00	0.00
					6507659.80	1820772.76	10.00	0.00
					6507632.80	1820745.65	10.00	0.00
					6507607.67	1820716.79	10.00	0.00
					6507584.54	1820686.31	10.00	0.00
					6507563.50	1820654.35	10.00	0.00
					6507548.22	1820622.77	10.00	0.00
					6507535.25	1820590.16	10.00	0.00
					6507524.67	1820556.70	10.00	0.00
					6507516.53	1820522.57	10.00	0.00
					6507510.88	1820487.94	10.00	0.00
					6507507.74	1820452.99	10.00	0.00
					6507507.13	1820417.91	10.00	0.00
					6507509.05	1820382.87	10.00	0.00
					6507513.49	1820348.06	10.00	0.00
					6507520.44	1820313.67	10.00	0.00
					6507529.84	1820279.86	10.00	0.00
					6507541.66	1820246.83	10.00	0.00
					6507555.84	1820214.73	10.00	0.00
					6507572.29	1820183.73	10.00	0.00
					6507590.94	1820154.01	10.00	0.00
					6507611.68	1820125.70	10.00	0.00
					6507654.54	1820077.55	10.00	0.00
					6507699.19	1820031.04	10.00	0.00
					6507745.54	1819986.23	10.00	0.00
					6507793.55	1819943.20	10.00	0.00
					6507843.13	1819902.00	10.00	0.00
					6507894.23	1819862.68	10.00	0.00
					6507983.79	1819801.52	10.00	0.00
					6508072.03	1819738.48	10.00	0.00
					6508158.93	1819673.59	10.00	0.00
					6508244.44	1819606.89	10.00	0.00
					6508328.53	1819538.40	10.00	0.00
					6508411.16	1819468.15	10.00	0.00
					6508566.02	1819329.30	10.00	0.00
					6508719.67	1819189.10	10.00	0.00
					6508872.09	1819047.58	10.00	0.00
					6508949.51	1818959.55	10.00	0.00
					6509025.74	1818870.50	10.00	0.00
					6509051.92	1818844.57	10.00	0.00
					6509079.76	1818820.43	10.00	0.00
					6509109.13	1818798.18	10.00	0.00
					6509139.90	1818777.91	10.00	0.00
					6509171.95	1818759.72	10.00	0.00
					6509205.12	1818743.69	10.00	0.00
					6509239.28	1818729.87	10.00	0.00
					6509658.55	1818645.24	10.00	0.00
					6509690.39	1818634.15	10.00	0.00
					6509721.38	1818620.90	10.00	0.00
					6509751.38	1818605.53	10.00	0.00

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
						6509780.24	1818588.12	10.00	0.00
						6509807.84	1818568.77	10.00	0.00
						6509834.03	1818547.55	10.00	0.00
						6509858.69	1818524.57	10.00	0.00
						6509881.70	1818499.94	10.00	0.00
						6509902.96	1818473.78	10.00	0.00
						6509922.36	1818446.21	10.00	0.00
						6509939.80	1818417.37	10.00	0.00
						6510037.48	1818227.58	10.00	0.00
						6510053.82	1818203.52	10.00	0.00
						6510072.09	1818180.90	10.00	0.00
						6510092.17	1818159.87	10.00	0.00
						6510113.93	1818140.58	10.00	0.00
						6510137.22	1818123.16	10.00	0.00
						6510161.86	1818107.73	10.00	0.00
						6510187.70	1818094.39	10.00	0.00
						6510214.56	1818083.24	10.00	0.00
						6510242.25	1818074.36	10.00	0.00
						6510270.58	1818067.81	10.00	0.00
						6511775.23	1817873.34	10.00	0.00

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)		
AREASOURCE		STOCK01	111.2	111.2	111.2	74.5	74.5	74.5	Lw	111.2					30	r
AREASOURCE		STOCK02	111.2	111.2	111.2	71.5	71.5	71.5	Lw	111.2					30	r

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
AREASOURCE	STOCK01	30.00	r			6508990.96	1820483.42	30.00	0.00
						6509067.32	1820452.23	30.00	0.00
						6508837.16	1819882.19	30.00	0.00
						6508760.79	1819913.38	30.00	0.00
AREASOURCE	STOCK02	30.00	r			6508378.97	1820729.72	30.00	0.00
						6508783.38	1820559.78	30.00	0.00
						6508776.50	1820536.05	30.00	0.00
						6508767.21	1820513.15	30.00	0.00
						6508755.63	1820491.33	30.00	0.00
						6508741.86	1820470.81	30.00	0.00
						6508726.06	1820451.82	30.00	0.00
						6508708.38	1820434.55	30.00	0.00
						6508689.03	1820419.18	30.00	0.00
						6508668.20	1820405.89	30.00	0.00
						6508646.12	1820394.80	30.00	0.00
						6508623.01	1820386.05	30.00	0.00
						6508599.13	1820379.71	30.00	0.00
						6508574.72	1820375.87	30.00	0.00
						6508550.54	1820376.40	30.00	0.00
						6508526.53	1820379.38	30.00	0.00
						6508502.95	1820384.77	30.00	0.00
						6508480.04	1820392.51	30.00	0.00
						6508458.02	1820402.53	30.00	0.00
						6508437.13	1820414.72	30.00	0.00
						6508417.58	1820428.96	30.00	0.00
						6508399.56	1820445.10	30.00	0.00
						6508383.28	1820462.99	30.00	0.00
						6508369.82	1820485.49	30.00	0.00
						6508358.61	1820509.19	30.00	0.00
						6508349.76	1820533.87	30.00	0.00
						6508343.36	1820559.30	30.00	0.00
						6508339.46	1820585.23	30.00	0.00
						6508338.10	1820611.41	30.00	0.00
						6508343.30	1820637.33	30.00	0.00
						6508350.07	1820662.88	30.00	0.00
						6508358.39	1820687.97	30.00	0.00
						6508368.22	1820712.51	30.00	0.00

Barrier(s)

Name	Sel.	M.	ID	Absorption		Z-Ext.	Cantilever		Height		Coordinates			
				left	right		horz.	vert.	Begin	End	x	y	z	Ground
						(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

APPENDIX 10.1:

TYPICAL CONSTRUCTION NOISE CALCULATIONS

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15951 - Bell Terminal

CadnaA Noise Prediction Model: 15951-03 Construction.cna
Date: 10.01.25
Analyst: B. Lawson

Calculation Configuration

Configuration	
Parameter	**Value**
General	
Max. Error (dB)	0.00
Max. Search Radius (ft)	6561.70
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (ft)	3280.80
Min. Length of Section (ft)	3.30
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
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	328.08
Search Radius Rcvr	328.08
Max. Distance Source - Rcvr	3280.84 3280.84
Min. Distance Rvcr - Reflector	3.28 3.28
Min. Distance Source - Reflector	0.33
Industrial (ISO 9613 (1996))	
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 (°F)	50
rel. Humidity (%)	70
Ground Absorption G	0.50
Wind Speed for Dir. (mph)	6.7
Roads (TNM)	
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	39.5	39.5	46.1	55.0	45.0	0.0				5.00	r	6509964.67	1818483.79	5.00
RECEIVERS		R2	27.5	27.5	34.2	55.0	45.0	0.0				5.00	r	6510095.79	1818244.51	5.00
RECEIVERS		R3	38.7	38.7	45.3	55.0	45.0	0.0				5.00	r	6510569.61	1818134.08	5.00
RECEIVERS		R4	21.6	21.6	28.3	55.0	45.0	0.0				5.00	r	6510720.35	1818088.80	5.00
RECEIVERS		R5	48.1	48.1	54.8	55.0	45.0	0.0				5.00	r	6507647.87	1818767.61	5.00
RECEIVERS		R6	48.7	48.7	55.4	55.0	45.0	0.0				5.00	r	6507169.48	1819375.66	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		CONSTRUCTION	116.0	116.0	116.0	68.4	68.4	68.4	Lw	116					8	a

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
SITEBOUNDARY	CONSTRUCTION	8.00	a			6508191.33	1820891.78	8.00	0.00
						6509112.18	1820513.33	8.00	0.00
						6508738.87	1819598.30	8.00	0.00
						6508626.85	1819711.08	8.00	0.00
						6508543.25	1819808.34	8.00	0.00
						6508252.19	1820395.06	8.00	0.00
						6508235.67	1820470.93	8.00	0.00
						6508221.23	1820547.21	8.00	0.00
						6508208.87	1820623.87	8.00	0.00

Name	ID	Height			Coordinates			
		Begin		End	x	y	z	Ground
		(ft)		(ft)	(ft)	(ft)	(ft)	(ft)
					6508198.60	1820700.83	8.00	0.00
					6508190.43	1820778.04	8.00	0.00

Barrier(s)

Name	Sel.	M.	ID	Absorption		Z-Ext.	Cantilever		Height		Coordinates			
				left	right		horz.	vert.	Begin	End	x	y	z	Ground
						(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

APPENDIX 10.2:

PEAK HOUR CONSTRUCTION NOISE CALCULATIONS

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16126 - Antelope Valley Commerce Center

CadnaA Noise Prediction Model: 16126-04_ConstructionPeak.cna
Date: 20.03.25
Analyst: B. Lawson

Calculation Configuration

Configuration	
Parameter	**Value**
General	
Max. Error (dB)	0.00
Max. Search Radius (ft)	10000.00
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (ft)	3280.80
Min. Length of Section (ft)	3.30
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
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	328.08
Search Radius Rcvr	328.08
Max. Distance Source - Rcvr	3280.84 3280.84
Min. Distance Rvcr - Reflector	3.28 3.28
Min. Distance Source - Reflector	0.33
Industrial (ISO 9613 (1996))	
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 (°F)	50
rel. Humidity (%)	70
Ground Absorption G	0.50
Wind Speed for Dir. (mph)	6.7
Roads (TNM)	
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	58.3	-48.7	55.3	55.0	45.0	0.0				5.00	a	5985773.95	2589709.21	5.00
RECEIVERS		R2	39.5	-67.2	36.5	55.0	45.0	0.0				5.00	a	5982996.39	2577013.90	5.00
RECEIVERS		R3	39.8	-67.0	36.8	55.0	45.0	0.0				5.00	a	5989789.47	2574189.74	5.00
RECEIVERS		R4	53.3	-53.6	50.3	55.0	45.0	0.0				5.00	a	5993594.59	2582061.48	5.00
RECEIVERS		R5	53.8	-53.2	50.8	55.0	45.0	0.0				5.00	a	5992218.79	2590627.74	5.00
RECEIVERS		R6	40.0	-66.8	37.0	55.0	45.0	0.0				5.00	a	5993066.38	2601039.78	5.00

Point Source(s)

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night			X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(ft)		(ft)	(ft)	(ft)
CONS_PEAK		0	118.4	118.4	118.4	Lw	118.4					8.00	a	5985918.77	2589704.57	0.00
CONS_PEAK		0	118.4	118.4	118.4	Lw	118.4					8.00	a	5987860.06	2582338.89	0.00
CONS_PEAK		0	118.4	118.4	118.4	Lw	118.4					8.00	a	5989816.59	2582311.72	0.00
CONS_PEAK		0	118.4	118.4	118.4	Lw	118.4					8.00	a	5992643.16	2582263.36	0.00
CONS_PEAK		0	118.4	118.4	118.4	Lw	118.4					8.00	a	5991199.89	2590641.68	0.00
CONS_PEAK		0	118.4	118.4	118.4	Lw	118.4					8.00	a	5991063.42	2595450.76	0.00

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APPENDIX 10.3:

NIGHTTIME CONCRETE POUR NOISE MODEL INPUTS

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16126 - Antelope Valley Commerce Center

CadnaA Noise Prediction Model: 16126-02_Pour.cna
Date: 30.12.24
Analyst: B. Lawson

Calculation Configuration

Configuration	
Parameter	**Value**
General	
Max. Error (dB)	0.00
Max. Search Radius (ft)	10000.00
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (ft)	3280.80
Min. Length of Section (ft)	3.30
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
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	328.08
Search Radius Rcvr	328.08
Max. Distance Source - Rcvr	3280.84 3280.84
Min. Distance Rvcr - Reflector	3.28 3.28
Min. Distance Source - Reflector	0.33
Industrial (ISO 9613 (1996))	
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 (°F)	50
rel. Humidity (%)	70
Ground Absorption G	0.50
Wind Speed for Dir. (mph)	6.7
Roads (TNM)	
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	40.2	-66.6	37.2	55.0	45.0	0.0				5.00	a	5985773.95	2589709.21	5.00
RECEIVERS		R2	21.4	-79.1	18.4	55.0	45.0	0.0				5.00	a	5982996.39	2577013.90	5.00
RECEIVERS		R3	21.7	-79.0	18.7	55.0	45.0	0.0				5.00	a	5989789.47	2574189.74	5.00
RECEIVERS		R4	35.2	-71.2	32.2	55.0	45.0	0.0				5.00	a	5993594.59	2582061.48	5.00
RECEIVERS		R5	35.7	-70.8	32.7	55.0	45.0	0.0				5.00	a	5992218.79	2590627.74	5.00
RECEIVERS		R6	21.9	-79.0	18.9	55.0	45.0	0.0				5.00	a	5993066.38	2601039.78	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		CONSTRUCTION 24	107.3	0.3	0.3	44.8	-62.2	-62.2	PWL-Pt	100.3					8	a
SITEBOUNDARY		CONSTRUCTION 678	107.3	0.3	0.3	46.8	-60.2	-60.2	PWL-Pt	100.3					8	a

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
SITEBOUNDARY	CONSTRUCTION 24	8.00	a			5988606.69	2595527.66	8.00	0.00
						5990994.13	2595512.10	8.00	0.00
						5991110.78	2595403.23	8.00	0.00
						5991196.32	2594617.79	8.00	0.00
						5991250.76	2594625.56	8.00	0.00
						5991274.09	2594384.48	8.00	0.00
						5991204.10	2590301.72	8.00	0.00
						5989882.06	2590317.28	8.00	0.00

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
						5989850.96	2588940.80	8.00	0.00
						5985884.85	2588987.46	8.00	0.00
						5985915.95	2590247.29	8.00	0.00
						5988536.70	2590223.96	8.00	0.00
SITEBOUNDARY	CONSTRUCTION 678	8.00	a			5987829.02	2584928.03	8.00	0.00
						5992331.72	2584881.37	8.00	0.00
						5992658.34	2582252.85	8.00	0.00
						5987844.57	2582330.62	8.00	0.00