Evans Road and Rider Street Multi-Family Housing

NOISE IMPACT ANALYSIS

CITY OF PERRIS

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
ANSI	American National Standards Institute
Calveno	California Vehicle Noise
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dBA	A-weighted decibels
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
INCE	Institute of Noise Control Engineering
L_{eq}	Equivalent continuous (average) sound level
L_{max}	Maximum level measured over the time interval
L_{min}	Minimum level measured over the time interval
mph	Miles per hour
OPR	Office of Planning and Research
Project	Evans Road and Rider Street Multi-Family Housing
REMEL	Reference Energy Mean Emission Level

EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to determine any potential noise impacts and the necessary noise mitigation measures, if any, for the proposed Evans Road and Rider Street Multi-Family Housing development ("Project") located south of Rider Street and west of Evans Road, in the City of Perris. The Project is proposed to consist of 308 multifamily attached residential dwelling units. This study has been prepared to satisfy applicable City of Perris standards and thresholds of significance based on Appendix G of the Guidelines for Implementation of the California Environmental Quality Act (State CEQA Guidelines). (1)

EXTERIOR NOISE LEVELS

The exterior noise levels at the building façade for units adjacent to Evans Road, and Rider Street will range from 66.3 to 69.6 dBA CNEL and 54.0 to 57.9 dBA CNEL at the common outdoor activity area (Pool Area). In addition, the Project site is located outside the 55 dBA CNEL noise level contour boundaries for March Air Reserve Base/Inland Port Airport. According to the City of Perris General Plan Noise Element Land Use Compatibility these unmitigated exterior noise levels are considered *normally acceptable*. This noise technical study will follow the guidelines that are set for normally acceptable development.

With the interior noise levels provided in this study, the proposed Project is expected to satisfy the City of Perris 45 dBA CNEL interior noise level standards for residential development.

OFF-SITE TRAFFIC NOISE

Traffic generated by the operation of the proposed Project will influence the traffic noise levels in surrounding off-site areas. To quantify the traffic noise increases on the surrounding off-site areas, the changes in traffic noise levels on eight roadway segments surrounding the Project site were calculated based on the change in the average daily traffic (ADT) volumes. The traffic noise levels provided in this analysis are based on the traffic forecasts found in *Evans Road and Rider Street Multi-Family Housing Traffic Impact Analysis*. (2) To assess the off-site noise level impacts associated with the proposed Project, noise level contour boundaries were developed for Existing traffic conditions, Opening Year, and Year 2040 traffic conditions with and without project traffic. Land uses along analyzed roadway segments would experience Project related traffic noise level increases of 0.0 to 0.5 dBA CNEL. Therefore, the analysis shows that the Project-related traffic noise level increases would be *less than significant*.

OPERATIONAL NOISE

The Project would include specific type of operational noise attributable to the Project, including air conditioning units, parking lot vehicle movements, trash enclosure activities, swimming pool activities, and outdoor activity areas. Project operational noise levels during the daytime hours at off-site receiver locations are expected to range from 42.5 to 51.0 dBA $L_{max.}$ Project operational noise levels during the nighttime hours at off-site receiver locations are expected to range from 41.5 to 48.6 dBA L_{max}. Project operational noise levels will satisfy Section 7.34.060 of the City of Perris Municipal Code daytime and nighttime noise standards of 80 dBA and 60 dBA L_{max}, respectively, at all residential receivers. Therefore, potential operational noise impacts for the residential land use are anticipated to result *less than significant* impacts.

CONSTRUCTION NOISE ANALYSIS

Construction noise levels are expected to create temporary and intermittent high noise levels at receivers surrounding the Project site when activities occur at the closest point to the nearby receiver locations from the edge of Project construction activity. Using reference noise levels to represent the construction activities at the Project site, this analysis estimates the Project-related construction noise levels at nearby sensitive receiver locations. The results of the analysis show the highest construction noise levels at the potentially impacted receiver locations are expected to approach 74.7 dBA L_{max}.

The Project related construction equipment noise levels are anticipated to satisfy the City of Perris Municipal Code construction noise level standards of 80 dBA for mobile equipment during typical Project construction activities at all receiver locations. Therefore, the short-term Project construction impacts are considered a *less than significant.*

CONSTRUCTION VIBRATION ANALYSIS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. It is expected that ground-borne vibration from Project construction activities would cause only intermittent, localized intrusion. Project construction vibration velocity levels are expected to approach 11.13 in/sec PPV at the nearest receiver locations, R4 and R5. Based on maximum acceptable continuous vibration threshold of 0.30 PPV (in/sec), the typical Project construction vibration levels will exceed the City of Perris thresholds at residential properties located to the south of the Project site and vibration impacts would be *significant* without mitigation.

Therefore, Mitigation Measure (MM) Noise-1 is recommended to be included in Project construction plans to limit the equipment that would operate along the southern property line, see Exhibit ES-A. With implementation of Mitigation Measure MM Noise-1, vibration level would be reduced to a less than significant level.

MM Noise-1: Large loaded trucks and dozers (greater than or equal to 80,000 pounds) (3) shall not be used within 15 feet of the northeast Property line, as shown on Exhibit ES-A. Instead, smaller, rubber-tired bulldozers (less than 80,000 pounds) shall be used within this area during Project construction to reduce vibration effects.

EXHIBIT ES-A: MITIGATION SUMMARY

SUMMARY OF CEQA SIGNIFICANCE FINDINGS

The results of this Evans Road and Rider Street Multi-Family Housing Noise Impact Analysis are summarized below based on the significance criteria in Section 4 of this report consistent with Appendix G of the State CEQA Guidelines. (1)(1) Table ES-1 shows the findings of significance for each potential noise and/or vibration impact under the California Environmental Quality Act (CEQA) before and after any required mitigation measures described below.

TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	Mitigated
On-Site Traffic Noise	7	*Less Than Significant*	-
Off-Site Traffic Noise	8	*Less Than Significant*	-
Operational Noise	10	*Less Than Significant*	-
Construction Noise	11	*Less Than Significant*	-
Construction Vibration		*Significant*	*Less Than Significant* -

1 INTRODUCTION

This noise analysis has been completed to determine the noise impacts associated with the development of the proposed Evans Road and Rider Street Multi-Family Housing ("Project"). This noise study briefly describes the proposed Project, provides information regarding noise fundamentals, describes the local regulatory setting, provides the study methods and procedures for noise analysis, evaluates potential noise impacts, and identifies mitigation to reduce noise impacts as necessary.

1.1 SITE LOCATION

The proposed Project site is located on the southwest corner of Evans Road and Rider Street in the City of Perris., as shown on Exhibit 1-A.

1.2 PROJECT DESCRIPTION

The Project would result in the construction and occupancy of approximately 308 apartment units, a swimming pool, a clubhouse, and basketball/tennis courts. Access to the project will be via one main driveway on Rider Street. A preliminary site plan is provided on Exhibit 1-B.

EXHIBIT 1-A: LOCATION MAP

EXHIBIT 1-B: PROJECT SITE PLAN

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2 FUNDAMENTALS

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

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. (4) The most common sounds vary between 40 dBA (very quiet) to 100 dBA (very loud). Normal conversation at three feet is roughly at 60 dBA, while loud jet engine noises equate to 110 dBA at approximately 100 feet, which can cause serious discomfort. (5) Another important aspect of noise is the duration of the sound and the way it is described and distributed in time.

2.2 NOISE DESCRIPTORS

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

Peak hour or average noise levels, while useful, do not completely describe a given noise environment. Noise levels lower than peak hour may be disturbing if they occur during times when quiet is most desirable, namely evening and nighttime (sleeping) hours. To account for this, the Community Noise Equivalent Level (CNEL), representing a composite 24-hour noise level is utilized. The CNEL is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time of day corrections require the addition of 5 decibels to dBA L_{eq} sound levels in the evening from 7:00 p.m. to 10:00 p.m., and the addition of 10 decibels to dBA L_{eq} sound levels at night between 10:00 p.m. and 7:00 a.m. These additions are made to account for the noise sensitive time periods during the evening and night hours when sound appears louder. CNEL does not represent the actual sound level heard at any time, but rather represents the total sound exposure. The City of Perris 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. (4)

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. (6)

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. (4)

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 FHWA does not consider the planting of vegetation to be a noise abatement measure. (6)

2.4 NOISE CONTROL

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

2.5 NOISE BARRIER ATTENUATION

Effective noise barriers can reduce noise levels by up to 10 to 15 dBA, cutting the loudness of traffic noise in half. A noise barrier is most effective when placed close to the noise source or receiver. Noise barriers, however, do have limitations. For a noise barrier to work, it must be high enough and long enough to block the path of the noise source. (6)

2.6 LAND USE COMPATIBILITY WITH NOISE

Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches, and residences are more sensitive to noise intrusion than are commercial or industrial developments and related activities. As ambient noise levels affect the perceived amenity or livability of a development, so too can the mismanagement of noise impacts impair the economic health and growth potential of a community by reducing the area's desirability as a place to live, shop and work. For this reason, land use compatibility with the noise environment is an important consideration in the planning and design process. The FHWA encourages State and Local government to regulate land development in such a way that noise-sensitive land uses are either prohibited from being located adjacent to a highway, or that the developments are planned, designed, and constructed in such a way that noise impacts are minimized. (7)

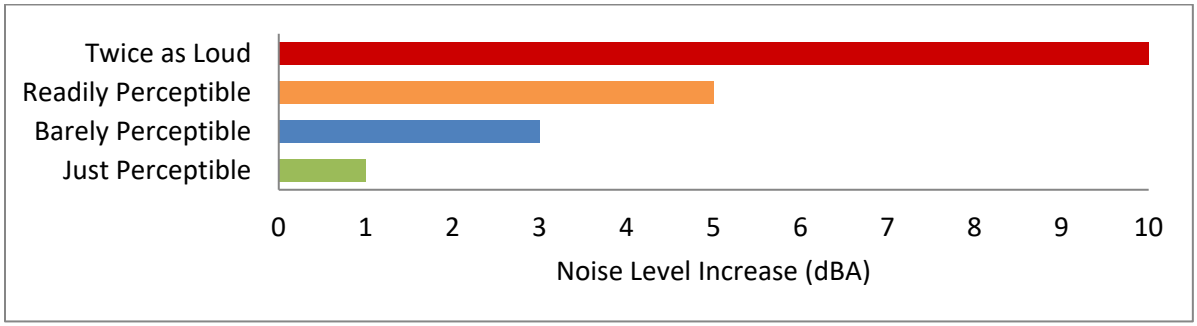
2.7 COMMUNITY RESPONSE TO NOISE

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

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

Approximately ten percent of the population has a very low tolerance for noise and will object to any noise not of their making. Consequently, even in the quietest environment, some complaints will occur. Twenty-five percent of the population will not complain even in very severe noise environments. Thus, a variety of reactions can be expected from people exposed to any given noise environment. (8) Surveys have shown that about ten percent of the people exposed to traffic noise of 60 dBA will report being highly annoyed with the noise, and each increase of one dBA is associated with approximately two percent more people being highly annoyed. When traffic noise exceeds 60 dBA or aircraft noise exceeds 55 dBA, people may begin to complain. (8) Despite this variability in behavior on an individual level, the population can be expected to exhibit the following responses to changes in noise levels as shown on Exhibit 2-B. A change of 3 dBA are considered *barely perceptible*, and changes of 5 dBA are considered *readily perceptible*. (6)

EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION



2.8 EXPOSURE TO HIGH NOISE LEVELS

The Occupational Safety and Health Administration (OSHA) sets legal limits on noise exposure in the workplace. The permissible exposure limit (PEL) for a worker over an eight-hour day is 90 dBA. The OSHA standard uses a 5 dBA exchange rate. This means that when the noise level is increased by 5 dBA, the amount of time a person can be exposed to a certain noise level to receive the same dose is cut in half. The National Institute for Occupational Safety and Health (NIOSH) has recommended that all worker exposures to noise should be controlled below a level equivalent to 85 dBA for eight hours to minimize occupational noise induced hearing loss. NIOSH also recommends a 3 dBA exchange rate so that every increase by 3 dBA doubles the amount of the noise and halves the recommended amount of exposure time. (9)

2.9 VIBRATION

As defined in the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual* (10) and the California Department of Transportation (Caltrans) *Transportation and Construction Vibration Guidance Manual* (11), 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. Typical outdoor sources of vibration waves that can propagate through the ground and may create perceptible ground-borne vibration in nearby buildings include construction equipment, steel-wheeled trains, and traffic on rough roads. If the roadway is fairly smooth, the vibration from rubber-tired traffic is rarely perceptible (10).

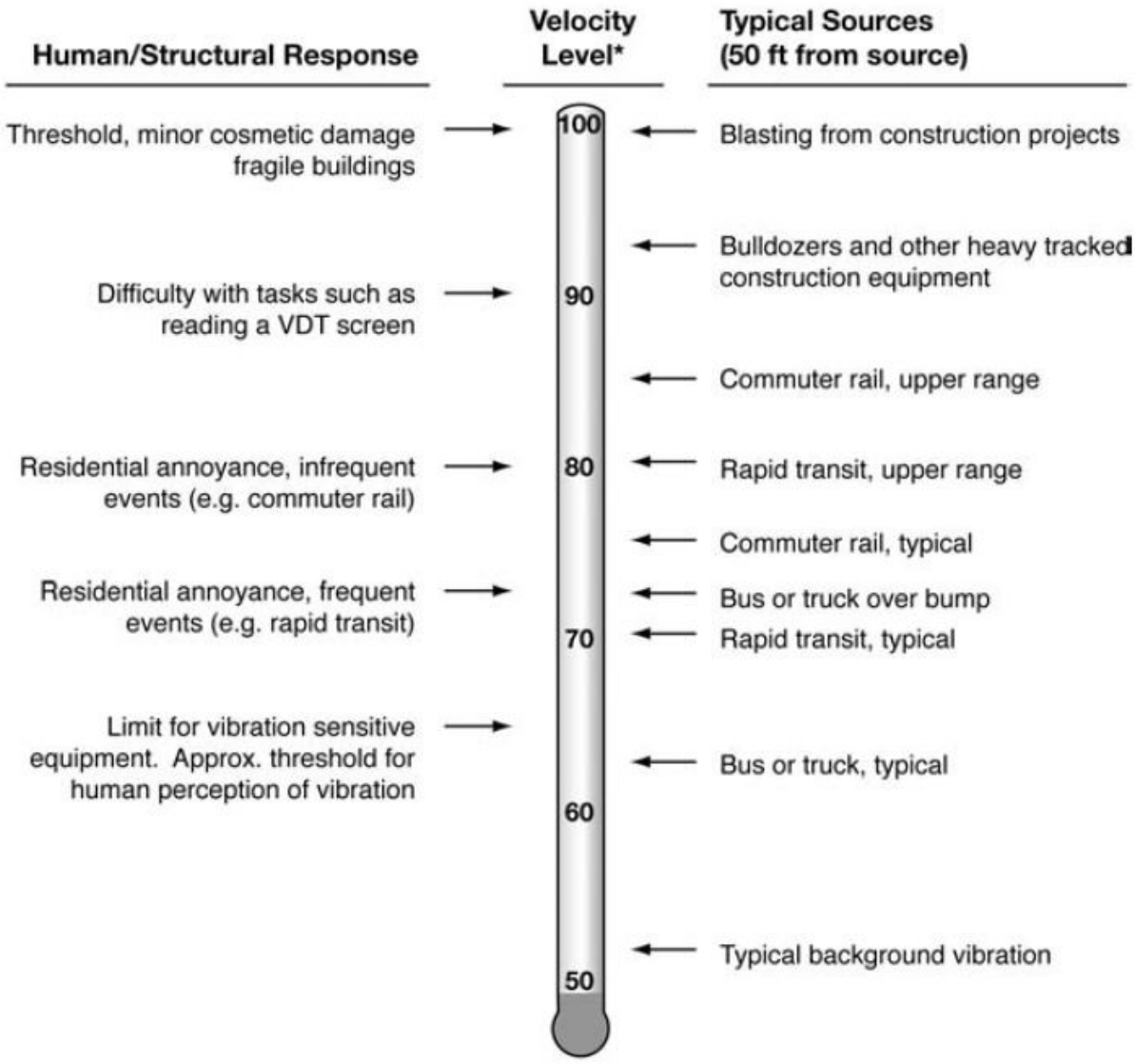
Additionally, in contrast to airborne noise, ground-borne vibration outdoors is not a common environmental problem and annoyance from ground-borne vibration is almost exclusively an indoor phenomenon (10). Therefore, the effects of vibrations should only be evaluated at a structure and the effects of 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 (10). 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 (10). 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 (10). 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 (11). Thus, either can be used on 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 (12). 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



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

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). (13) The purpose of the Noise Element is to *limit the exposure of the community to excessive noise levels*. In addition, the California Environmental Quality Act (CEQA) requires that all known environmental effects of a project be analyzed, including environmental noise impacts.

3.2 STATE OF CALIFORNIA BUILDING STANDARDS CODE

The State of California's noise insulation standards for all residential units are codified in the California Code of Regulations (CCR), Title 24, Building Standards Administrative Code, Chapter 12, Section 1206. These noise standards are applied to new construction that contains dwelling units or sleeping units, such as residential and hotel or motel uses, in California for controlling interior noise levels resulting from exterior noise sources. For new residential buildings, the acceptable interior noise limit is 45 dBA CNEL in habitable rooms (14).

3.3 CITY OF PERRIS GENERAL PLAN NOISE ELEMENT

The City of Perris has adopted a Noise Element of the General Plan (15) to control and abate environmental noise, and to protect the citizens of Perris from excessive exposure to noise. The Noise Element provides guidelines for unmitigated exterior noise levels for new developments impacted by transportation noise sources such as arterial roads, freeways, airports, and railroads. In addition, the Noise Element identifies noise polices and implementation measures designed to protect, create, and maintain an environment free from noise that may jeopardize the health or welfare of sensitive receptors, or degrade quality of life. To protect Perris residents from unacceptable noise levels, the Noise Element contains the following objectives:

Goal I. *Future land uses compatible with projected noise environments.*
Goal II *Roadway improvements compatible with existing noise-sensitive land uses.*

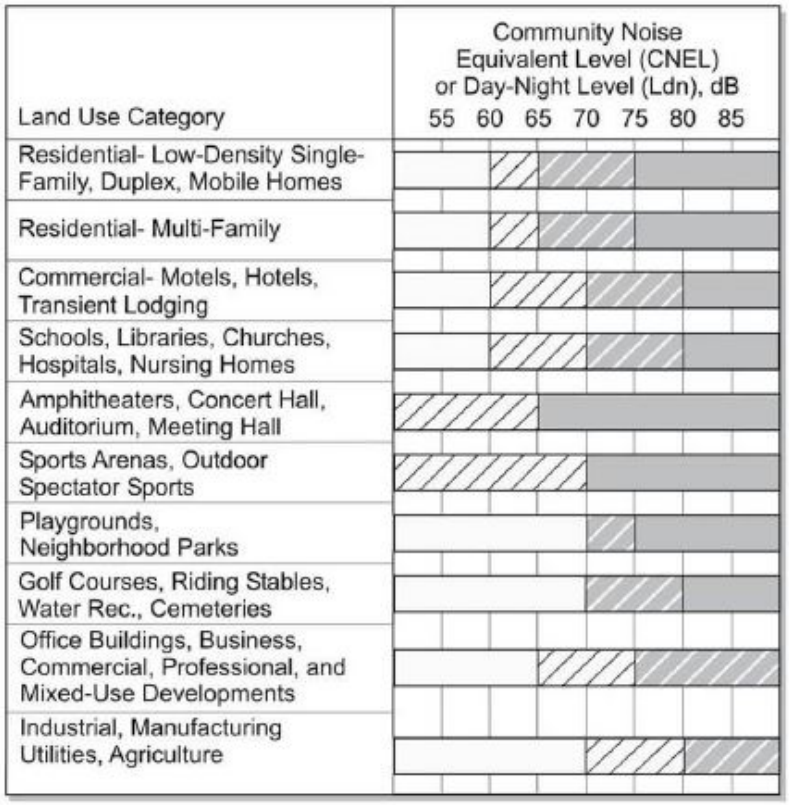
The noise policies specified in the City of Perris Noise Element provide the guidelines necessary to satisfy these objectives. To ensure the appropriate exterior and interior noise levels for existing and new land uses, Exhibit N-1 of the City of Perris General Plan Noise Element, shown on Exhibit 3-A, identifies a maximum allowable exterior *normally acceptable* noise level of 60 dBA CNEL and an interior noise level

limit of 45 dBA CNEL for residential homes impacted by transportation noise sources such as arterial roads, freeways, airports and railroads. This sets an interior noise level limit of 45 dBA CNEL for new residential developments impacted by transportation noise sources such as arterial roads, freeways, airports, railroads, and warehousing uses. The Noise Element also provides several policies to reduce noise impacts from transportation (II.A.1, II.A.2) that includes the use of quieter roadway surface materials, roadway alignment, noise barriers, and pavement surface treatments.

The policies included in the General Plan Noise Element consider land use compatibility and identify exterior noise level compatibility standards for transportation related noise. The *Land Use Compatibility for Community Noise Environments* matrix shown on Exhibit 3-A provides the City with a planning tool to gauge the compatibility of land uses relative to existing and future exterior noise levels.

According to the City's *Land Use Compatibility for Community Noise Environments* (Exhibit N-1), multi-family residential land uses such as the Evans Road and Rider Street Multi-Family Housing Project are considered *normally acceptable* with exterior noise levels below 60 dBA CNEL and *conditionally acceptable* with noise levels below 65 dBA CNEL. For land uses within the *normally unacceptable* category, where exterior noise levels range from 65 to 75 dBA CNEL, *new construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise-insulation features must be included in the design*.

EXHIBIT 3-A: CITY OF PERRIS NOISE COMPATIBILITY GUIDELINE



Nature of the noise environment where the CNEL or Ldn level is:

Below 55 dB
Relatively quiet suburban or urban areas, no arterial streets within 1 block, no freeways within 1/4 mile.

55-65 dB
Most somewhat noisy urban areas, near but not directly adjacent to high volumes of traffic.

65-75 dB
Very noisy urban areas near arterials, freeways or airports.

75+ dB
Extremely noisy urban areas adjacent to freeways or under airport traffic patterns. Hearing damage with constant exposure outdoors.

Normally Acceptable
Specific land use is satisfactory, based on the assumption that any building is of normal conventional construction, without any special noise insulation requirements

Conditionally Acceptable
New construction or development should be undertaken only after a detailed analysis of noise reduction requirements is made and needed noise insulation features included in design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice.

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

Clearly Unacceptable
New construction or development should generally not be undertaken.

The Community Noise Equivalent Level (CNEL) and Day-Night Noise Level (Ldn) are measures of the 24-hour noise environment. They represent the constant A-weighted noise level that would be measured if all the sound energy received over the day were averaged. In order to account for the greater sensitivity of people to noise at night, the CNEL weighting includes a 5-decibel penalty on noise between 7:00 p.m. and 10:00 p.m. and a 10-decibel penalty on noise between 10:00 p.m. and 7:00 a.m. of the next day. The Ldn includes only the 10-decibel weighting for late-night noise events. For practical purposes, the two measures are equivalent for typical urban noise environments.

City of Perris General Plan Noise Element, Exhibit N-1.

3.4 OPERATIONAL NOISE STANDARDS

To analyze noise impacts originating from a designated fixed location or private property such as the Project's operational noise sources, such as the expected air conditioning units, parking lot vehicle movements, trash enclosure activities, swimming pool activities, and outdoor activity areas, are typically evaluated against standards established under a City's Municipal Code.

The City of Perris Municipal Code, Chapter 7.34 *Noise Control*, Section 7.34.040, establishes the permissible noise level at any point on the property line of the affected residential receivers. The City of Perris Municipal Code does not identify any exterior noise level standards for non-residential land use. Therefore, for residential properties, the exterior noise level shall not exceed a maximum noise level of 80 dBA L_{max} during daytime hours (7:01 a.m. to 10:00 p.m.) and shall not exceed a maximum noise level of 60 dBA L_{max} during the nighttime hours (10:01 p.m. to 7:00 a.m.), as shown on Table 3-1. (16) The City of Perris Municipal Code is included in (13) Appendix 3.1.

Additional exterior noise level standards are identified in the City of Perris General Plan Noise Element Implementation Measure V.A.1 which requires that new industrial facilities within 160 feet of the property line of existing noise-sensitive land uses must demonstrate compliance with a 60 dBA CNEL exterior noise level standard. Table 3-1 shows the Municipal Code and General Plan standards used in this analysis to evaluate the potential operational noise levels from the Project.

TABLE 3-1: OPERATIONAL NOISE STANDARDS

Jurisdiction	Land Use	Time Period	Noise Level Standard (dBA)
City of Perris	Residential[1]	Daytime (7:01 a.m. - 10:00 p.m.)	80 dBA L_{max}
		Nighttime (10:01 p.m. - 7:00 a.m.)	60 dBA L_{max}
	Industrial within 160 Feet of PL[2]	24-Hours	60 dBA CNEL

[1] Source: City of Perris Municipal Code, Sections 7.34.040 & 7.34.050 (Appendix 3.1).
[2] Source: City of Perris General Plan Noise Element, Implementation Measure V.A.1.

3.5 CONSTRUCTION NOISE STANDARDS

To analyze noise impacts originating from the construction of the Project, noise from construction activities are typically evaluated against standards established under a City's Municipal Code. The City of Perris Municipal Code, Section 7.34.060 included in Appendix 3.1, identifies the City's construction noise standards and permitted hours of construction activity (refer to Table 3-1). Further, the City of Perris Municipal Code, Section 7.34.060, states that the noise level standard of 80 dBA L_{max} at residential properties shall apply to the noise-sensitive receiver locations located in the City of Perris. (16)

TABLE 3-2: CONSTRUCTION NOISE STANDARDS

Jurisdiction	Permitted Hours of Construction Activity	Construction Noise Level Standard
City of Perris[1]	7:00 a.m. to 7:00 p.m. on any day except Sundays and legal holidays (with the exception of Columbus Day and Washington's birthday).	80 dBA L_{max}

[1] City of Perris Municipal Code, Section 7.34.060 (Appendix 3.1).

3.6 VIBRATION STANDARDS

To analyze vibration impacts originating from the operation and construction of the Evans Road and Rider Street Multi-Family Housing, vibration-generating activities are appropriately evaluated against standards established under a City's Municipal Code, if such standards exist. However, the City of Perris does not identify specific vibration level limits. Therefore, for analysis purposes, the Caltrans *Transportation and Construction Vibration Guidance Manual*, (11 p. 38) Table 19, vibration damage are used in this noise study to assess potential temporary construction-related impacts at adjacent building locations.

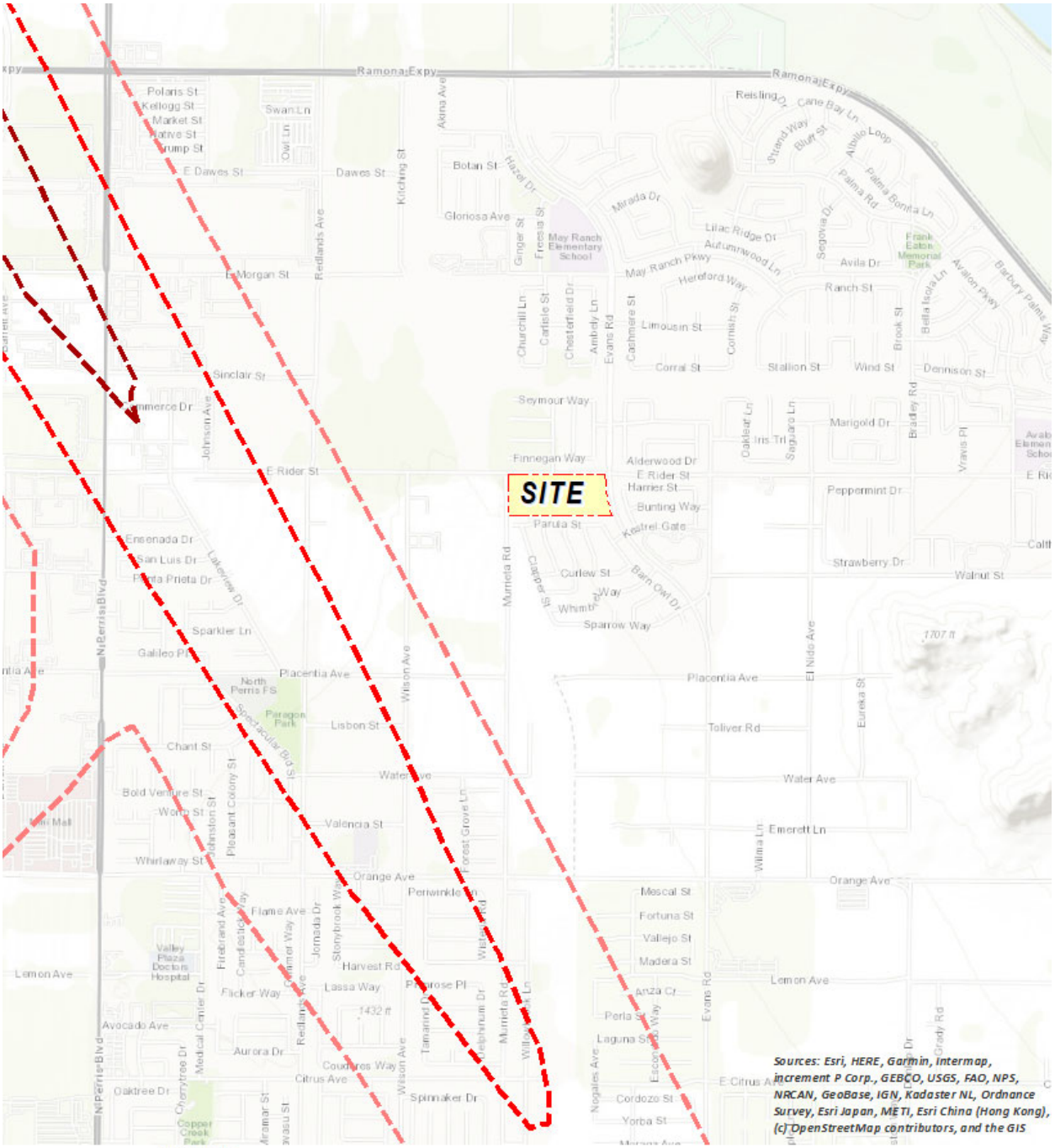
The construction vibration damage potential criteria include consideration of the building conditions. (5 p. 182) Table 3-2 describes the maximum acceptable transient and continuous vibration building damage potential levels by structure type and condition. The existing buildings adjacent to the Project site can best be described as "older residential structures" with a maximum acceptable continuous vibration threshold of 0.30 PPV (in/sec).

3.7 AIRPORT LAND USE COMPATIBILITY

March Air Reserve Base/Inland Port Airport (MARB/IPA) is located approximately 3.1 miles northwest of the Project site boundary. The March Air Reserve Base/Inland Port Airport Land Use Compatibility Plan (MARB/IPA ALUCP) includes the policies for determining the land use compatibility of the Project. (14) The MARB/IPA ALCUP, Map MA-1, indicates that the Project site is located within Compatibility Zone D, and the Table MA-1 Compatibility Zone Factors indicates that this area is considered to have a moderate to low noise impact, and is outside the 55 dBA CNEL noise level contour boundaries. Consistent with the Basic Compatibility Criteria, listed in Table MA-2 of the MARB/IPA ALUCP, noise sensitive outdoor uses are permitted.

The noise level contour boundaries of MARB/IPA are presented on Exhibit 3-A of this report and show that the Project is considered normally acceptable land use since it is located outside the 60 dBA CNEL noise level contour boundaries.

EXHIBIT 3-A: MARB/IPA FUTURE AIRPORT NOISE LEVEL CONTOURS



4 SIGNIFICANCE CRITERIA

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

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

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

C. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

While the City of Perris General Plan Noise Element provides direction on noise compatibility and establish noise standards by land use type that are sufficient to assess the significance of noise impacts, it does not define the levels at which increases are considered substantial for use under Guideline A. State CEQA Guidelines Appendix G noise threshold C applies to nearby public and private airports, if any, and the Project's land use compatibility.

4.1 STATE CEQA GUIDELINES NOT FURTHER ANALYZED

The closest airport which would require additional noise analysis under State CEQA Guidelines Appendix G noise threshold C is MARB/IPA. As previously described in Section 3.7, the Project site is within MARB/IPA Compatibility Zone D, and the MARB/IPA ACLUP Table MA-1 Compatibility Zone Factors indicates that this area is considered to have a *moderate to low* noise impact as the Project site is located outside the 60 dBA CNEL noise level contour. Therefore, the potential impacts under CEQA Appendix G Guideline C, are *less than significant* and are not further analyzed in this noise analysis.

4.2 NOISE-SENSITIVE RECEIVERS

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

Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise or of the corresponding human reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted—the so-called *ambient* environment. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will typically be judged. The Federal Interagency Committee on Noise (FICON) (19) developed guidance to be used for the assessment of project-generated increases in noise levels that consider the ambient noise level. The FICON recommendations are based on studies that relate aircraft noise levels to the percentage of persons highly annoyed by aircraft noise. Although the FICON recommendations were

specifically developed to assess aircraft noise impacts, these recommendations are often used in environmental noise impact assessments involving the use of cumulative noise exposure metrics, such as the average-daily noise level (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 the noise impact significant*, based on a 2008 California Court of Appeal ruling on Gray v. County of Madera. (18) For example, if the ambient noise environment is quiet (<60 dBA) and the new noise source greatly increases the noise levels, an impact may occur if the noise criteria may be exceeded. Therefore, for this analysis, FICON identifies a *readily perceptible* 5 dBA or greater project-related noise level increase is considered a significant impact when the noise criteria for a given land use is exceeded. 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 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 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 (6 p. 9) and Caltrans (20 p. 2_48).

4.3 SIGNIFICANCE CRITERIA SUMMARY

Noise impacts shall be considered significant if any of the following occur as a direct result of the proposed development. Table 4-1 shows the significance criteria summary matrix.

TABLE 4-1: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Receiving Land Use	Condition(s)	Significance Criteria	
			Daytime	Nighttime
On-Site	Noise-Sensitive[1]	See Exhibit 3-A	See Exhibit 3-A	
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	
Operational	Residential	Noise Level Threshold[2]	80 dBA L_{max}	60 dBA L_{max}
Construction	Noise-Sensitive	It is unlawful for any person between the hours of 7:00 p.m. of any day and 7:00 a.m. of the following day, or on a legal holiday, with the exception of Columbus Day and Washington's birthday, or on Sundays to erect, construct, demolish, excavate, alter or repair any building or structure in such a manner as to create disturbing, excessive or offensive noise.[2]		
		Noise Level Threshold[3]	80 dBA L_{max}	n/a
		Vibration Level Threshold[4]	0.30 PPV (in/sec)	n/a

[1] FICON, 1992.
[2] City of Perris Municipal Code, Section 7.34.040 and 7.34.050 (Appendix 3.1).
[3] City of Perris Municipal Code, Section 7.34.060 (Appendix 3.1).
[4] Caltrans Transportation and Construction Vibration Manual, April 2020 Table 19.
"Daytime" = 7:01 a.m. - 10:00 p.m.; "Nighttime" = 10:01 p.m. - 7:00 a.m., "PPV" = Peak Particle Velocity

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5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, 24-hour noise level measurements were taken at five 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 shows the Project site and the noise level measurement locations. To fully describe the existing noise conditions, noise level measurements were collected by Urban Crossroads, Inc. on Thursday, December 16, 2021. Appendix 5.1 includes study area photos.

5.1 MEASUREMENT PROCEDURE AND CRITERIA

To describe the existing noise environment, the hourly noise levels were measured during typical weekday conditions over a 24-hour period. By collecting individual hourly noise level measurements, it is possible to describe the daytime and nighttime hourly noise levels and calculate the 24-hour CNEL. The long-term noise readings were recorded using Piccolo Type 2 integrating sound level meter and dataloggers. The Piccolo sound level meters were calibrated using a Larson-Davis calibrator, Model CAL 150. All noise meters were programmed in "slow" mode to record noise levels in "A" weighted form. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (21)

5.2 NOISE MEASUREMENT LOCATIONS

The long-term noise level measurements were positioned as close to the nearest sensitive receiver locations as possible to assess the existing ambient hourly noise levels surrounding the Project site. Both Caltrans and the FTA recognize that it is not reasonable to collect noise level measurements that can fully represent every part of a private yard, patio, deck, or balcony normally used for human activity when estimating impacts for new development projects. This is demonstrated in the Caltrans general site location guidelines which indicate that, *sites must be free of noise contamination by sources other than sources of interest. Avoid sites located near sources such as barking dogs, lawnmowers, pool pumps, and air conditioners unless it is the express intent of the analyst to measure these sources*. (4) 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* (10).

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 (10). In other words, the area represented by the receiver shares similar shielding, terrain, and geometric relationship to the reference noise source. Receivers represent a location of noise sensitive areas and are used to estimate the future noise level impacts. Collecting reference ambient noise level measurements at the nearby sensitive receiver locations allows for a comparison of the before and after Project noise levels and is necessary to assess potential noise impacts due to the Project's contribution to the ambient noise levels.

EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS

5.3 NOISE MEASUREMENT RESULTS

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

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

	Description	Energy Average Noise Level (dBA L_{eq})[2]	
		Daytime	Nighttime
L1	Located northwest of the Project site near single-family residence at 805 Finnegan Way.	74.2	70.6
L2	Located northeast of the Project site near single-family residence at 985 Finnegan Way.	71.5	68.6
L3	Located east of the Project site near single-family residence at 3176 Shrike Lane.	70.4	68
L4	Located southeast of the Project site near single-family residence at 988 Parula Street.	63.1	60.6
L5	Located southwest of the Project site near single-family residence at 812 Parula Street.	54.3	52.7

[1] See Exhibit 5-A for the noise level measurement locations conducted on December 16, 2021.
[2] Energy (logarithmic) average levels. The long-term 24-hour measurement worksheets are included in Appendix 5.2.
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

Table 5-1 provides the (energy average) noise levels used to describe the daytime and nighttime ambient conditions. These daytime and nighttime energy average noise levels represent the average of all hourly noise levels observed during these time periods expressed as a single number. Appendix 5.2 provides summary worksheets of the noise levels for each hour as well as the minimum, maximum, L_1, L_2, L_5, L_8, L_{25}, L_{50}, L_{90}, L_{95}, and L_{99} percentile noise levels observed during the daytime and nighttime periods. The background ambient noise levels in the Project study area are dominated by the transportation-related noise associated with nearby surface streets and MARB/IPA aircraft flyovers. This includes the auto and heavy truck activities on study area roadway segments near the noise level measurement locations.

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6 METHODS AND PROCEDURES

The following section outlines the methods and procedures used to estimate and analyze the future traffic noise environment. Consistent with the City of Perris General Noise Element, all transportation related noise levels are presented in terms of the 24-hour CNEL's.

6.1 FHWA TRAFFIC NOISE PREDICTION MODEL

The estimated roadway noise impacts from vehicular traffic were calculated using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108. (22) The FHWA Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). In California the national REMELs are substituted with the California Vehicle Noise (Calveno) Emission Levels. (23) 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.

6.2 ON-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

The on-site roadway parameters including the average daily traffic (ADT) volumes used for this study are presented on Table 6-1. Based on the City of Perris General Plan Circulation Element Exhibit CE-4, Evans Road and Rider Street are classified as a 4-lane Secondary Arterials. (24). To predict the future on-site noise environment at the Project site, parameters including the number of lanes and average daily traffic volumes were obtained from the City of Perris General Plan Circulation Element Table CE-2.

TABLE 6-1: ON-SITE ROADWAY PARAMETERS

Roadway	Lanes	Classification[1]	Design Capacity (ADT)[2]	Speeds (MPH)[3]	Site Conditions
Evans Road	4	Secondary Arterial	28,700	45	Soft
Rider Street	4	Secondary Arterial	28,700	45	Soft

[1] City of Perris General Plan Circulation Element, Exhibit CE-4, 2008.
[2] City of Perris General Plan Circulation Element, Table CE-2, 2008.
[3] Speed limits

The traffic volumes shown in Table 6-1 reflect future long-range traffic conditions needed to assess the future on-site traffic noise environment and to identify potential mitigation measures (if any) that address the worst-case future conditions. For the purposes of this analysis, soft site conditions were used to analyze the on-site traffic noise impacts for the Project study area. Soft site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation. 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. (25) Table 6-2 presents the time-of-day vehicle splits by vehicle type used to develop the 24-hour CNEL, and Table 6-3 presents the total traffic flow distributions (vehicle mixes) used for this analysis. The information in Tables 6-2 and 6-3 provides

the hourly distribution percentages of automobile, medium trucks, and heavy trucks for input into the FHWA Model based on roadway types.

TABLE 6-2: TIME OF DAY VEHICLE SPLITS

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

[1] Typical Southern California vehicle mix.
"Daytime" = 7:00 a.m. to 7:00 p.m.; "Evening" = 7:00 p.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

TABLE 6-3: DISTRIBUTION OF TRAFFIC FLOW BY VEHICLE TYPE (VEHICLE MIX)

Roadway	Total % Traffic Flow			Total
	Autos	Medium Trucks	Heavy Trucks	
All Roadways[1]	97.42%	1.84%	0.74%	100.00%

[1] Typical Southern California vehicle mix.

To predict the future noise environment at each building within the Project site, coordinate information was collected to identify the noise transmission path between the noise source and receiver. The coordinate information is based on the site plan showing the plotting of each building in relationship to adjacent analyzed roadways, as shown in Appendix 4.1. The plans are used to identify the relationship between the roadway centerline elevation, the pad elevation and the centerline distance to the noise barrier, and the building façade. The first-floor exterior noise level receivers were placed five feet above the pad elevation. Second- floor receiver locations were placed at 14 feet above the pad elevations. Third-floor receiver locations were placed at 23 feet above the pad elevations (Building 2D adjacent to Rider Street).

6.3 OFF-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

Table 6-4 identifies the fourteen off-site study area roadway segments, the distance from the centerline to adjacent land use based on the functional roadway classifications per the City of Perris General Plan Connected City Element, and the posted vehicle speeds. Consistent with the Traffic Analysis prepared by Urban Crossroads, Inc. for the Project, (26) the off-site traffic noise analysis includes the following traffic scenarios.

- Existing Without Project (E)
- Existing With Project (E+P)
- Opening Year Without Project (OY)
- Opening Year With Project (OY+P)
- Horizon Year (2040) Without Project (HY)
- Horizon Year (2040) With Project (HY+P)

The average daily traffic (ADT) volumes used for this study are presented on Table 6-5. Table 6-2 and Table 6-3 provides the time of day (daytime, evening, and nighttime) vehicle splits used for calculating CNEL values.

TABLE 6-4: OFF-SITE ROADWAY PARAMETERS

ID	Roadway	Segment	Receiving Land Use[1]	Classification[2]	Centerline Distance to Receiving Land Use (Feet)[3]	Vehicle Speed (mph)
1	Rider St.	w/o Driveway 1	Sensitive	Secondary Arterial	55'	45
2	Rider St.	e/o Driveway 1	Sensitive	Secondary Arterial	55'	45
3	Rider St.	e/o Evans Rd.	Sensitive	Secondary Arterial	55'	45
4	Ramona Expressway	w/o Evans Rd.	Sensitive	Expressway	85'	55
5	Ramona Expressway	e/o Evans Rd.	Sensitive	Expressway	85'	55
6	Evans Rd.	n/o Ramona Expressway	Sensitive	Secondary Arterial	65'	45
7	Evans Rd.	s/o Ramona Expressway	Sensitive	Secondary Arterial	65'	45
8	Evans Rd.	s/o Rider St.	Sensitive	Secondary Arterial	65'	45

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] City of Perris General Plan Housing Element.
[3] Based upon the right-of-way distances for each roadway classification provided in the City of Perris General Plan Circulation Element.

TABLE 6-5: AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Existing		Opening Year		Horizon Year (2040)	
			Without Project	With Project	Without Project	With Project	Without Project	With Project
1	Rider St.	w/o Project Driveway	11,160	11,480	12,630	12,950	13,520	13,840
2	Rider St.	e/o Project Driveway	10,770	12,020	12,220	13,470	13,090	14,340
3	Rider St.	e/o Evans Rd.	6,770	7,010	7,400	7,640	7,880	8,120
4	Ramona Expressway	w/o Evans Rd.	28,100	28,500	32,160	32,560	37,420	37,820
5	Ramona Expressway	e/o Evans Rd.	19,370	19,450	22,730	22,810	28,740	28,820
6	Evans Rd.	n/o Ramona Expressway	19,560	19,720	21,600	21,760	29,930	30,090
7	Evans Rd.	s/o Ramona Expressway	13,670	14,310	15,130	15,770	24,170	24,810
8	Evans Rd.	s/o Rider St.	9,990	10,390	11,020	11,420	21,190	21,590

[1]Evans Road and Rider Street Multi-Family Housing Traffic Impact Analysis, translutions, Inc. May 19, 2022

7 ON-SITE TRAFFIC NOISE LEVELS

An on-site exterior noise level analysis has been completed to determine the traffic noise exposure and to identify potential necessary noise abatement measures for the proposed Evans Road and Rider Street Multi-Family Housing Project to meet City standards for new residential land uses. It is expected that the primary source of noise to the Project site will be traffic noise from Rider Street and Evans Road in the Project study area. The Project will also experience some background traffic noise from its internal local streets, however, due to the distance, topography and low traffic volume/speed, traffic noise from these roads will not make a substantial contribution to the noise environment.

7.1 ON-SITE EXTERIOR NOISE ANALYSIS

Using the FHWA traffic noise prediction model and the parameters outlined in Tables 6-1 to 6-3, the expected future exterior noise levels were calculated. Table 7-1 presents a summary of future exterior noise level impacts at the building facades of the proposed residential dwelling units and at the common outdoor activity area (Pool Area) consistent with the standards of the City of Perris General Plan Noise Element. The on-site traffic noise level analysis indicates that the Project will experience unmitigated exterior noise levels ranging from 54.0 to 57.9 dBA CNEL at the Pool Area due to Evans Road and Rider Street, respectively. In addition, traffic noise modeling does not take into account the noise reduction provided by on-site intervening buildings, which would further reduce exterior traffic noise levels at the Pool Area. This noise analysis shows that the Project will satisfy the City of Perris normally acceptable exterior noise standard for multi-family residential land uses of 60 dBA CNEL at the primary exterior use area. All calculations are provided in Appendix 7.1.

TABLE 7-1: EXTERIOR NOISE LEVELS (CNEL)

Building	Roadway	Unmitigated Noise Level Exterior (dBA CNEL)[1]
2D	Rider Street	66.3
1A, 2A, 3A	Rider Street	69.6
2B	Evans Road	68.2
1A, 2A	Evans Road	68.0
Pool Area	Evans Road	54.0
Pool Area	Rider Street	57.9

[1] Exterior noise level calculations are included Appendix 7.1.

7.2 ON-SITE INTERIOR NOISE ANALYSIS

The future noise levels were calculated at the first, second, and third-floor building façades to ensure that the interior noise levels comply with the City of Perris 45 dBA CNEL interior noise standards.

7.2.1 NOISE REDUCTION METHODOLOGY

The interior noise level is the difference between the predicted exterior noise level at the building façade and the noise reduction of the structure. Typical building construction will provide a Noise Reduction (NR)

of approximately 12 dBA with "windows open" and a minimum 25 dBA noise reduction with "windows closed." However, sound leaks, cracks and openings within the window assembly can greatly diminish its effectiveness in reducing noise. Several methods are used to improve interior noise reduction, including: (1) weather-stripped solid core exterior doors; (2) upgraded dual glazed windows; (3) mechanical ventilation/air conditioning; and (4) exterior wall/roof assembles free of cut outs or openings.

7.2.2 INTERIOR NOISE LEVEL ASSESSMENT

Tables 7-2 to 7-4 show that the residential dwelling units nearest Rider Street, and Evans Road will require a windows-closed condition with a means of mechanical ventilation (e.g. air conditioning) to achieve the City of Perris 45 dBA CNEL interior noise level standard. Table 7-2 shows that the future unmitigated noise levels at the first-floor building façade are expected to range from 66.3 to 69.6 dBA CNEL. Table 7-3 shows the future unmitigated interior noise levels at the second-floor building façade will range from 66.8 to 69.9 dBA CNEL, and Table 7-4 shows the future unmitigated interior noise levels at the third-floor building façade will be 66.6 dBA CNEL. The interior noise level analysis shows that the City of Perris 45 dBA CNEL interior noise standards can be satisfied using standard building practices and a windows-closed condition with a means of mechanical ventilation (e.g. air conditioning).

TABLE 7-2: FIRST FLOOR INTERIOR NOISE IMPACTS (CNEL)

Location	Roadway	Noise Level at Façade[1]	Required Interior NR[2]	Calculated Interior NR[3]	Upgraded Windows[4]	Interior Noise Level[5]	Threshold	Threshold Exceeded?
2D	Rider Street	66.3	21.3	25.0	No	41.3	45	No
1A, 2A, 3A	Rider Street	69.6	24.6	25.0	No	44.6	45	No
2B	Evans Road	68.2	23.2	25.0	No	43.2	45	No
1A, 2A	Evans Road	68.0	23.0	25.0	No	43.0	45	No

[1] Exterior noise level at the facade with a windows closed condition requiring a means of mechanical ventilation (e.g. air conditioning).
[2] Noise reduction required to satisfy the 45 dBA CNEL interior noise standards.
[3] Estimated minimum interior noise reduction.
[4] Does the required interior noise reduction trigger upgraded with a minimum STC rating of greater than 27?
[5] Estimated interior noise level with minimum STC rating for all windows.
"NR" = Noise reduction

TABLE 7-3: SECOND FLOOR INTERIOR NOISE IMPACTS (CNEL)

Location	Roadway	Noise Level at Façade[1]	Required Interior NR[2]	Calculated Interior NR[3]	Upgraded Windows[4]	Interior Noise Level[5]	Threshold	Threshold Exceeded?
2D	Rider Street	66.8	21.8	25.0	No	41.8	45.0	No
1A, 2A, 3A	Rider Street	69.9	24.9	25.0	No	44.9	45.0	No
2B	Rider Street	68.6	23.6	25.0	No	43.6	45.0	No
1A, 2A	Evans Road	68.3	23.3	25.0	No	43.3	45.0	No

[1] Exterior noise level at the facade with a windows closed condition requiring a means of mechanical ventilation (e.g. air conditioning).
[2] Noise reduction required to satisfy the 45 dBA CNEL interior noise standards.
[3] Calculated minimum interior noise reduction in second floor bedrooms (Table 5-2)
[4] Does the required interior noise reduction trigger upgraded with a minimum STC rating of 27?
[5] Estimated interior noise level with minimum STC rating for all windows.
"NR" = Noise reduction

TABLE 7-4: THIRD FLOOR INTERIOR NOISE IMPACTS (CNEL)

Location	Roadway	Noise Level at Façade[1]	Required Interior NR[2]	Calculated Interior NR[3]	Upgraded Windows[4]	Interior Noise Level[5]	Threshold	Threshold Exceeded?
2D	Rider Street	66.6	21.6	25.0	No	41.6	45.0	No

[1] Exterior noise level at the facade with a windows closed condition requiring a means of mechanical ventilation (e.g. air conditioning).
[2] Noise reduction required to satisfy the 45 dBA CNEL interior noise standards.
[3] Calculated minimum interior noise reduction in second floor bedrooms (Table 5-2)
[4] Does the required interior noise reduction trigger upgraded with a minimum STC rating of 27?
[5] Estimated interior noise level with minimum STC rating for all windows.
"NR" = Noise reduction

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8 OFF-SITE TRANSPORTATION NOISE IMPACTS

To assess the off-site transportation CNEL noise level impacts associated with the proposed Project, noise level contours were developed based on the *Evans Road and Rider Street Multi-Family Housing Traffic Impact Analysis* (26). Noise level contour boundaries represent the equal levels of noise exposure and are measured in CNEL from the center of the roadway. Noise level contours were developed for the following traffic scenarios:

- Existing Conditions Without Project: This scenario refers to the existing present-day noise conditions without the proposed Project.
    1. Existing With Project: This scenario refers to the existing present-day noise conditions with the proposed Project.
- Opening Year Without the Project: This scenario refers to cumulative near term noise conditions without the proposed Project.
    1. Opening Year With Project: This scenario includes all cumulative projects identified in the *Traffic Impact Analysis*.
- Year 2040 Without the Project: This scenario refers to Year 2045 cumulative noise conditions without the proposed Project.
    1. Year 2040 Year With Project: This scenario includes all cumulative projects identified in the *Traffic Impact Analysis*.

8.1 TRAFFIC NOISE LEVEL CONTOURS

Noise level contours were used to assess the Project's incremental 24-hour dBA CNEL traffic-related noise impacts at land uses adjacent to roadways conveying Project traffic. The noise level contours represent the distance to noise levels of a constant value and are measured from the center of the roadway for the 70, 65, and 60 dBA CNEL noise levels. The noise level contours do not consider the effect of any existing noise barriers or topography that may attenuate ambient noise levels. In addition, because the noise level 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 8-1 through 8-6 present a summary of the exterior dBA CNEL traffic noise levels. Roadway segments are analyzed in each of the following timeframes: Existing without and with Project conditions, OY Year without and with Project conditions, and Year 2040 without and with Project conditions. Appendix 8.1 includes a summary of the dBA CNEL traffic noise level contours for each of the traffic scenarios.

TABLE 8-1: EXISTING WITHOUT PROJECT NOISE LEVEL CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Rider St.	w/o Driveway 1	Sensitive	67.4	RW	RW	155
2	Rider St.	e/o Driveway 1	Sensitive	67.2	RW	RW	151
3	Rider St.	e/o Evans Rd.	Sensitive	65.2	RW	RW	111
4	Ramona Expressway	w/o Evans Rd.	Sensitive	72.4	RW	183	394
5	Ramona Expressway	e/o Evans Rd.	Sensitive	70.8	RW	143	308
6	Evans Rd.	n/o Ramona Expressway	Sensitive	69.8	RW	105	225
7	Evans Rd.	s/o Ramona Expressway	Sensitive	68.3	RW	RW	177
8	Evans Rd.	s/o Rider St.	Sensitive	66.9	RW	RW	144

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

TABLE 8-2: EXISTING WITH PROJECT NOISE LEVEL CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Rider St.	w/o Driveway 1	Sensitive	67.5	RW	RW	158
2	Rider St.	e/o Driveway 1	Sensitive	67.7	RW	RW	163
3	Rider St.	e/o Evans Rd.	Sensitive	65.4	RW	RW	114
4	Ramona Expressway	w/o Evans Rd.	Sensitive	72.4	RW	185	398
5	Ramona Expressway	e/o Evans Rd.	Sensitive	70.8	RW	143	309
6	Evans Rd.	n/o Ramona Expressway	Sensitive	69.8	RW	105	227
7	Evans Rd.	s/o Ramona Expressway	Sensitive	68.4	RW	RW	183
8	Evans Rd.	s/o Rider St.	Sensitive	67.1	RW	RW	148

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

TABLE 8-3: OPENING YEAR NOISE LEVEL CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Rider St.	w/o Driveway 1	Sensitive	67.9	RW	RW	168
2	Rider St.	e/o Driveway 1	Sensitive	67.8	RW	RW	165
3	Rider St.	e/o Evans Rd.	Sensitive	65.6	RW	RW	118
4	Ramona Expressway	w/o Evans Rd.	Sensitive	73.0	RW	200	432
5	Ramona Expressway	e/o Evans Rd.	Sensitive	71.5	RW	159	342
6	Evans Rd.	n/o Ramona Expressway	Sensitive	70.2	RW	112	241
7	Evans Rd.	s/o Ramona Expressway	Sensitive	68.7	RW	88	190
8	Evans Rd.	s/o Rider St.	Sensitive	67.3	RW	RW	154

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

TABLE 8-4: OPENING YEAR NOISE LEVEL CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Rider St.	w/o Driveway 1	Sensitive	68.0	RW	RW	171
2	Rider St.	e/o Driveway 1	Sensitive	68.2	RW	RW	176
3	Rider St.	e/o Evans Rd.	Sensitive	65.7	RW	RW	120
4	Ramona Expressway	w/o Evans Rd.	Sensitive	73.0	RW	202	435
5	Ramona Expressway	e/o Evans Rd.	Sensitive	71.5	RW	159	343
6	Evans Rd.	n/o Ramona Expressway	Sensitive	70.3	RW	112	242
7	Evans Rd.	s/o Ramona Expressway	Sensitive	68.9	RW	91	195
8	Evans Rd.	s/o Rider St.	Sensitive	67.5	RW	RW	157

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

TABLE 8-5: YEAR 2040 NOISE LEVEL CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Rider St.	w/o Driveway 1	Sensitive	68.2	RW	RW	176
2	Rider St.	e/o Driveway 1	Sensitive	68.1	RW	RW	172
3	Rider St.	e/o Evans Rd.	Sensitive	65.9	RW	RW	123
4	Ramona Expressway	w/o Evans Rd.	Sensitive	73.6	RW	222	477
5	Ramona Expressway	e/o Evans Rd.	Sensitive	72.5	RW	186	400
6	Evans Rd.	n/o Ramona Expressway	Sensitive	71.7	RW	139	299
7	Evans Rd.	s/o Ramona Expressway	Sensitive	70.7	RW	120	259
8	Evans Rd.	s/o Rider St.	Sensitive	70.2	RW	110	238

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

TABLE 8-6: YEAR 2040 NOISE LEVEL CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Nearest Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Rider St.	w/o Driveway 1	Sensitive	68.3	RW	RW	179
2	Rider St.	e/o Driveway 1	Sensitive	68.5	RW	RW	183
3	Rider St.	e/o Evans Rd.	Sensitive	66.0	RW	RW	125
4	Ramona Expressway	w/o Evans Rd.	Sensitive	73.7	RW	223	481
5	Ramona Expressway	e/o Evans Rd.	Sensitive	72.5	RW	186	401
6	Evans Rd.	n/o Ramona Expressway	Sensitive	71.7	RW	139	300
7	Evans Rd.	s/o Ramona Expressway	Sensitive	70.8	RW	123	264
8	Evans Rd.	s/o Rider St.	Sensitive	70.2	RW	112	241

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

8.2 EXISTING PROJECT TRAFFIC NOISE LEVELS

Table 8-1 shows the Existing without Project conditions CNEL noise levels. The Existing without Project exterior noise levels are expected to range from 65.2 to 72.4 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 8-2 shows the Existing plus Project conditions will range from 65.4 to 72.4 dBA CNEL. Table 8-7 shows that the Project off-site traffic noise level increases will range from 0.0 to 0.5 dBA CNEL. Based on the significance criteria for off-site traffic noise presented in Section 4.2, land uses adjacent to the study area roadway segments would experience *less than significant* noise level increases due to unmitigated Project-related traffic noise levels.

8.3 OPENING YEAR TRAFFIC NOISE LEVEL INCREASES

Table 8-3 presents the Opening Year without Project conditions CNEL noise levels. The Opening Year without Project exterior noise levels are expected to range from 65.6 to 73.0 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 8-4 shows the Opening Year 2024 with Project conditions will range from 65.7 to 73.0 dBA CNEL. Table 8-8 shows that the Project off-site traffic noise level increases will range from 0.0 to 0.4 dBA CNEL. Based on the significance criteria for off-site traffic noise presented in Section 4.2, land uses adjacent to the study area roadway segments would experience *less than significant* noise level increases due to unmitigated Project-related traffic noise levels.

8.3 YEAR 2040 TRAFFIC NOISE LEVEL INCREASES

Table 8-5 presents the Horizon Year 2045 without Project conditions CNEL noise levels. The Year 2040 without Project exterior noise levels are expected to range from 65.9 to 73.6 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 8-6 shows the Year 2040 with Project conditions will range from 66.0 to 73.7 dBA CNEL. Table 8-9 shows that the Project off-site traffic noise level increases will range from 0.0 to 0.4 dBA CNEL. Based on the significance criteria for off-site traffic noise presented in Section 4.2, land uses adjacent to the study area roadway segments would experience *less than significant* noise level increases due to unmitigated Project-related traffic noise levels.

TABLE 8-7: EXISTING WITH PROJECT TRAFFIC NOISE INCREASES

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]			Incremental Noise Level Increase Threshold[3]	
				No Project	With Project	Project Addition	Limit	Exceeded?
1	Rider St.	w/o Driveway 1	Sensitive	67.4	67.5	0.1	1.5	No
2	Rider St.	e/o Driveway 1	Sensitive	67.2	67.7	0.5	1.5	No
3	Rider St.	e/o Evans Rd.	Sensitive	65.2	65.4	0.2	n/a	No
4	Ramona Expressway	w/o Evans Rd.	Sensitive	72.4	72.4	0.0	3.0	No
5	Ramona Expressway	e/o Evans Rd.	Sensitive	70.8	70.8	0.0	3.0	No
6	Evans Rd.	n/o Ramona Expressway	Sensitive	69.8	69.8	0.0	n/a	No
7	Evans Rd.	s/o Ramona Expressway	Sensitive	68.3	68.4	0.1	n/a	No
8	Evans Rd.	s/o Rider St.	Sensitive	66.9	67.1	0.2	n/a	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)?

TABLE 8-8: OPENING YEAR WITH PROJECT TRAFFIC NOISE INCREASES

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]			Incremental Noise Level Increase Threshold[3]	
				No Project	With Project	Project Addition	Limit	Exceeded?
1	Rider St.	w/o Driveway 1	Sensitive	67.9	68.0	0.1	1.5	No
2	Rider St.	e/o Driveway 1	Sensitive	67.8	68.2	0.4	1.5	No
3	Rider St.	e/o Evans Rd.	Sensitive	65.6	65.7	0.1	n/a	No
4	Ramona Expressway	w/o Evans Rd.	Sensitive	73.0	73.0	0.0	3.0	No
5	Ramona Expressway	e/o Evans Rd.	Sensitive	71.5	71.5	0.0	3.0	No
6	Evans Rd.	n/o Ramona Expressway	Sensitive	70.2	70.3	0.1	3.0	No
7	Evans Rd.	s/o Ramona Expressway	Sensitive	68.7	68.9	0.2	n/a	No
8	Evans Rd.	s/o Rider St.	Sensitive	67.3	67.5	0.2	n/a	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)?

TABLE 8-9: YEAR 2040 WITH PROJECT TRAFFIC NOISE INCREASES

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]			Incremental Noise Level Increase Threshold[3]	
				No Project	With Project	Project Addition	Limit	Exceeded?
1	Rider St.	w/o Driveway 1	Sensitive	68.2	68.3	0.1	1.5	No
2	Rider St.	e/o Driveway 1	Sensitive	68.1	68.5	0.4	1.5	No
3	Rider St.	e/o Evans Rd.	Sensitive	65.9	66.0	0.1	n/a	No
4	Ramona Expressway	w/o Evans Rd.	Sensitive	73.6	73.7	0.1	3.0	No
5	Ramona Expressway	e/o Evans Rd.	Sensitive	72.5	72.5	0.0	3.0	No
6	Evans Rd.	n/o Ramona Expressway	Sensitive	71.7	71.7	0.0	3.0	No
7	Evans Rd.	s/o Ramona Expressway	Sensitive	70.7	70.8	0.1	3.0	No
8	Evans Rd.	s/o Rider St.	Sensitive	70.2	70.2	0.0	3.0	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)?

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9 RECEIVER LOCATIONS

To assess the potential for long-term operational and short-term construction noise impacts, the following sensitive receiver locations, as shown on Exhibit 9-A, were identified as representative locations for analysis. Sensitive receivers are generally defined as locations where people reside or where the presence of unwanted sound could otherwise adversely affect the use of the land. Noise-sensitive land uses are generally considered to include schools, hospitals, single-family dwellings, mobile home parks, churches, libraries, and recreation areas. Moderately noise-sensitive land uses typically include multi-family dwellings, hotels, motels, dormitories, out-patient clinics, cemeteries, golf courses, country clubs, athletic/tennis clubs, and equestrian clubs. Land uses that are considered relatively insensitive to noise include business, commercial, and professional developments. Land uses that are typically not affected by noise include: industrial, manufacturing, utilities, agriculture, undeveloped land, parking lots, warehousing, liquid and solid waste facilities, salvage yards, and transit terminals.

To describe the potential off-site Project noise levels, five receiver locations in the vicinity of the Project site were identified. All distances are measured from the Project site boundary to the outdoor living areas (e.g., private backyards) or at the building façade, whichever is closer to the Project site. The selection of receiver locations is based on FHWA guidelines and is consistent with additional guidance provided by Caltrans and the FTA, as previously described in Section 5.2. Other sensitive land uses in the Project study area that are located at greater distances than those identified in this noise study will experience lower noise levels than those presented in this report due to the additional attenuation from distance and the shielding of intervening structures. Distance is measured in a straight line from the project boundary to each receiver location.

R1: Location R1 represents the property line of the existing residence at 805 Finnegan Way, approximately 62 feet northwest of the Project site. A 24-hour noise measurement was taken near this location, L1, to describe the existing ambient noise environment.

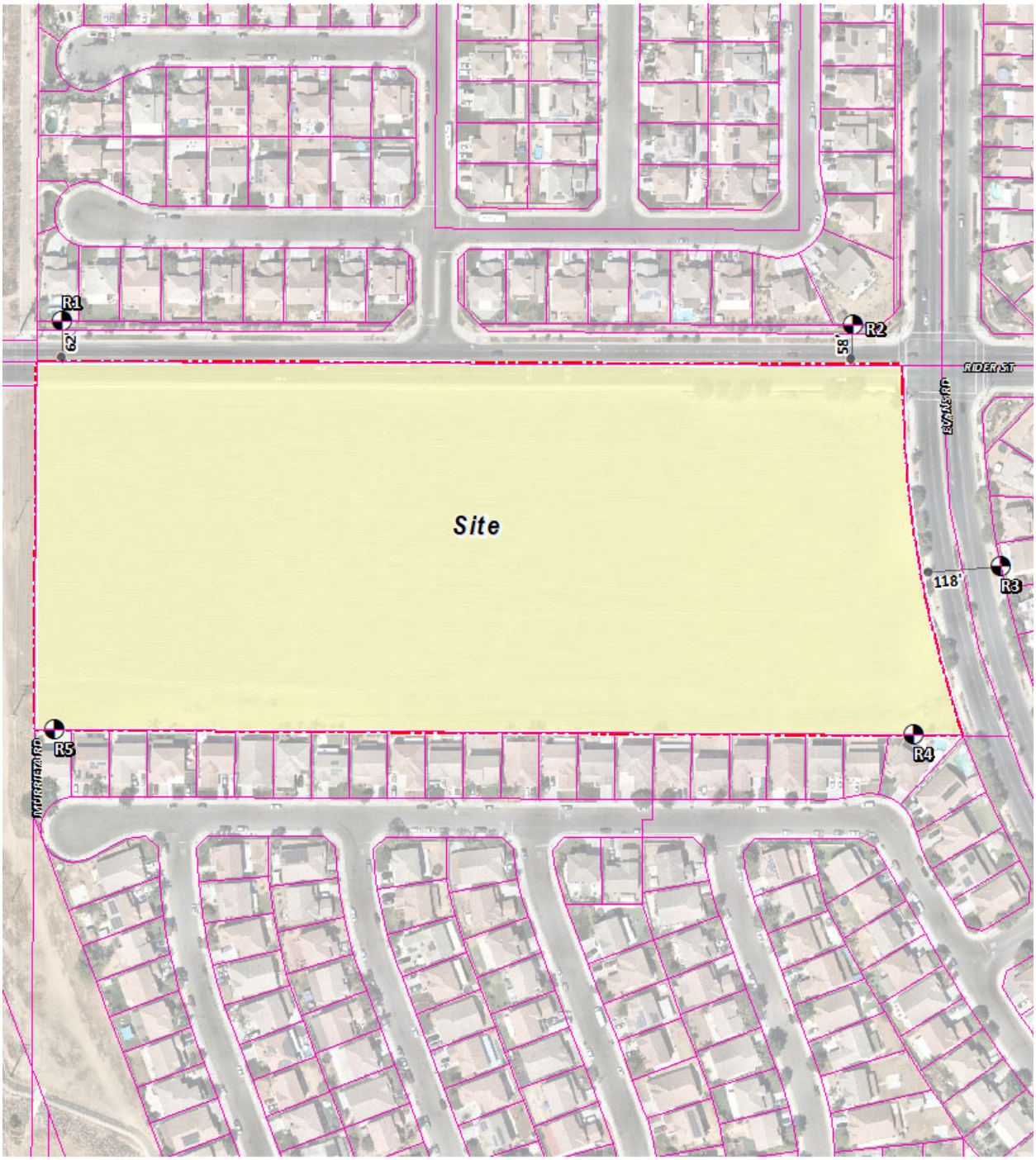
R2: Location R2 represents the property line of the existing noise sensitive residence at 985 Finnegan Way, approximately 58 feet northeast of the Project site. A 24-hour noise measurement was taken near this location, L2, to describe the existing ambient noise environment.

R3: Location R3 represents the property line of the existing noise sensitive residence at 3176 Shrike Lane, approximately 118 feet east of 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 property line of the existing noise sensitive residence at 988 Parula Street, directly south of the Project's property line. A 24-hour noise measurement was taken near this location, L4, to describe the existing ambient noise environment.

R5: Location R5 represents the property line of the existing noise sensitive residence at 812 Parula Street, directly south of the Project's property line. A 24-hour noise measurement was taken near this location, L5, to describe the existing ambient noise environment.

EXHIBIT 9-A: RECEIVER LOCATIONS



10 OPERATIONAL NOISE ANALYSIS

This section analyzes the potential stationary-source operational noise impacts at the nearest receiver locations, identified in Section 8, resulting from the operation of the proposed Project. Exhibit 10-A identifies the noise source locations used to assess the operational noise levels.

10.1 OPERATIONAL NOISE SOURCES

This operational noise analysis is intended to describe noise level impacts associated with the expected typical of daytime and nighttime activities at the Project site. To present the potential worst-case noise conditions, this analysis assumes the Project would be operational 24 hours per day, seven days per week. The on-site Project-related noise sources are expected to include: air conditioning units, parking lot vehicle movements, trash enclosure activities, swimming pool activities, and outdoor activity areas.

AIR CONDITIONING UNITS

To assess the noise levels created by the air conditioning units, reference noise levels were taken from equipment specifications for a 3-ton residential packaged air conditioning unit (Carrier 48VGB24). Each air conditioning unit was modeled as operating 45 minutes per hour during the daytime and 30 minutes during the nighttime. For this noise analysis, the air conditioning units are expected to be ground mounted adjacent to the proposed buildings. The air conditioning units are anticipated to be located 3 feet above the ground level. At a uniform reference distance of 50 feet, each unit would generate a reference noise level of 44.4 dBA L_{max}.

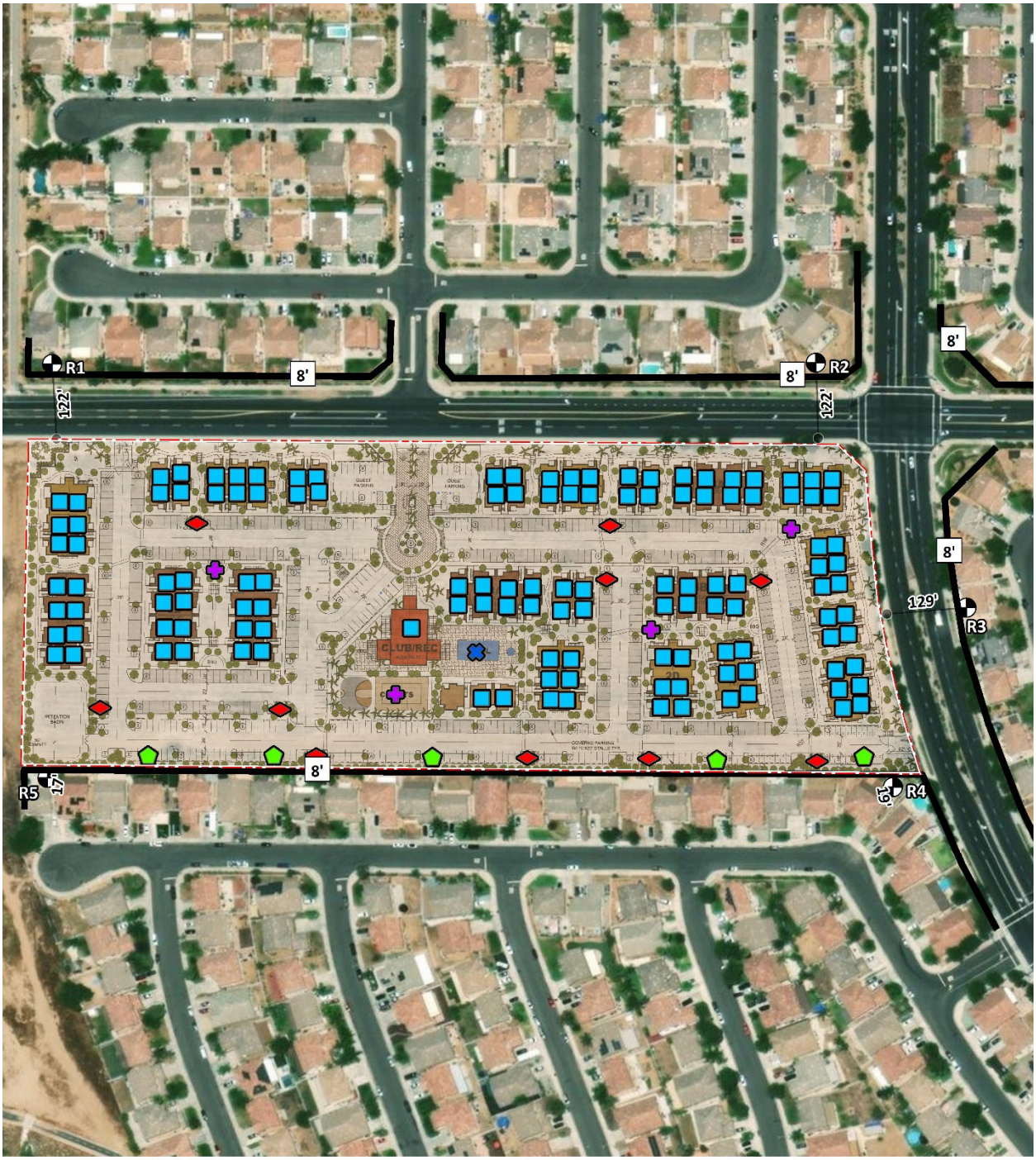
PARKING LOT/GARAGE ACTIVITY

To describe the on-site parking lot activity, a long-term 29-hour reference noise level measurement was collected in the center of activity within the staff parking lot of an Amazon warehouse distribution center. At 50 feet from the center of activity, the parking lot produced a reference noise level of 60.2 dBA L_{max} and 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 cars pulling in and out of parking spaces in combination with car doors opening and closing.

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, 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 71.1 dBA L_{max} and 56.8 dBA L_{eq} for the trash enclosure activity. The reference noise level describes the expected noise source activities associated with the trash enclosures for each of the Project buildings. Typical trash enclosure activities are estimated to occur for 5 minutes per hour.

EXHIBIT 10-A: OPERATIONAL NOISE SOURCE LOCATIONS



POOL/SPA ACTIVITY

To represent the noise levels associated with pool activities, Urban Crossroads collected a reference noise level measurement at the Covenant Hill Clubhouse Pool in the unincorporated community of Ladera Ranch in the County of Orange. The reference noise level at 50 feet is 54.7 dBA L_{eq} for pool activity. The pool activity noise levels include kids playing, running, screaming, splashing, playing with a ball, and parents talking. Pool and Spa activities are estimated to occur for 60 minutes during all the daytime hours, with no nighttime activities.

OUTDOOR ACTIVITY AREA

To describe the outdoor common area courtyards activity areas, a reference noise level measurement was taken by Urban Crossroads, Inc,. At 50 feet, the reference noise level is 59.8 dBA L_{eq} at a noise source height of 5 feet. The reference noise level measurement includes outdoor eating, drinking, with patrons laughing and talking. Outdoor activities are limited to the daytime hours.

10.2 REFERENCE NOISE LEVELS

To estimate the 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. While sound pressure levels (e.g., L_{max}) 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 reference project operational noise levels are based on the Project related noise sources shown on Exhibit 10-A. The reference Project operational sound power levels are summarized in Table 10-1.

TABLE 10-1: REFERENCE NOISE LEVEL MEASUREMENTS

Noise Source	Noise Source Height (Feet)	Min./Hour[3]		Reference Noise Level (dBA L_{max})	Sound Power Level (dBA)[6]
		Day	Night	@ 50 Feet	
Air Conditioning Units[1]	3'	60	60	44.6	76.2
Parking Lot Vehicle Movements[2]	5'	60	60	56.7	88.4
Trash Enclosure Activity[2]	8'	10	10	71.1	102.7
Outdoor Activity[2]	5'	60	0	71.5	103.1
Pool/Spa Activity[2]	5'	60	0	80.6	112.3

[1] Carrier 48VGB24 3-ton model packaged air conditioning unit.
[2] As measured by Urban Crossroads, Inc.
[3] Anticipated duration (minutes within the hour) of noise activity during typical hourly conditions expected at the Project site.
"Daytime" = 7:01 a.m. to 10:00 p.m.; "Nighttime" = 10:01 p.m. to 7:00 a.m.

10.3 CADNAA NOISE PREDICTION MODEL

To fully describe the exterior operational noise levels from the Project, Urban Crossroads, Inc. developed a noise prediction model using the CadnaA (Computer Aided Noise Abatement) computer program. CadnaA can analyze multiple types of noise sources using the spatially accurate Project site plan, georeferenced Nearmap aerial imagery, topography, buildings, and barriers in its calculations to predict outdoor noise levels.

Using the ISO 9613 protocol, CadnaA will calculate the distance from each noise source to the noise receiver locations, using the ground absorption, distance, and barrier/building attenuation inputs to provide a summary of noise level at each receiver and the partial noise level contributions by noise source. Consistent with the ISO 9613 protocol, the CadnaA noise prediction model relies on the reference sound power level (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 simi-hard ground surfaces.

10.4 PROJECT OPERATIONAL NOISE LEVELS

Using the reference noise levels to represent the proposed Project operations that include air conditioning units, parking lot vehicle movements, trash enclosure activities, swimming pool activities, and outdoor activity areas, 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 10-2 shows the Project operational noise levels during the daytime hours of 7:00 a.m. to 10:00 p.m. The daytime hourly noise levels at the off-site receiver locations are expected to range from 42.5 to 51.0 dBA L_{max}.

TABLE 10-2: DAYTIME PROJECT OPERATIONAL NOISE LEVELS

Noise Source[1]	Operational Noise Levels by Receiver Location (dBA L_{max})				
	R1	R2	R3	R4	R5
Air Conditioning Units	32.3	34.4	33.4	34.4	31.9
Parking Lot Vehicle Movements	28.7	29.5	32.5	45.4	38.5
Trash Enclosure Activity	41.9	43.2	42.6	49.5	47.4
Outdoor Activity	44.6	48.1	46.2	46.2	45.2
Pool/Spa Activity	46.6	47.8	45.4	48.4	48.1
Total (All Noise Sources)	**42.5**	**43.9**	**43.5**	**51.0**	**48.0**

[1] See Exhibit 10-A for the noise source locations. CadnaA noise model calculations are included in Appendix 10.1.

Table 10-3 shows the Project operational noise levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. The nighttime hourly noise levels at the off-site receiver locations are expected to range from 41.5 to 50.1 dBA L_{max}. Appendix 10.1 includes the detailed noise model inputs used to estimate the Project operational noise levels.

TABLE 10-3: NIGHTTIME PROJECT OPERATIONAL NOISE LEVELS

Noise Source[1]	Operational Noise Levels by Receiver Location (dBA L_{max})				
	R1	R2	R3	R4	R5
Air Conditioning Units	31.3	33.4	32.5	33.4	30.9
Parking Lot Vehicle Movements	27.7	28.5	31.5	44.4	37.6
Trash Enclosure Activity	40.9	42.2	41.6	48.6	46.4
Outdoor Activity	0.0	0.0	0.0	0.0	0.0
Pool/Spa Activity	0.0	0.0	0.0	0.0	0.0
Total (All Noise Sources)	**41.5**	**42.9**	**42.5**	**50.1**	**47.0**

[1] See Exhibit 10-A for the noise source locations. CadnaA noise model calculations are included in Appendix 10.1.

10.5 PROJECT OPERATIONAL NOISE LEVEL COMPLIANCE

To demonstrate compliance with local noise regulations, the Project-only operational noise levels are evaluated against exterior noise level thresholds based on the City of Perris exterior noise level standards at nearby noise-sensitive receiver locations. Table 10-4 shows the operational noise levels associated with Evans Road and Rider Street Multi-Family Housing Project will satisfy the City of Perris 80 dBA L_{max} daytime and 60 dBA L_{max} nighttime exterior noise level standards at the nearest receiver locations. Therefore, the operational noise impacts are considered *less than significant* at the nearby noise-sensitive receiver locations.

TABLE 10-4: OPERATIONAL NOISE LEVEL COMPLIANCE

Receiver Location[1]	Project Operational Noise Levels (dBA Lmax)[2]		Noise Level Standards (dBA Lmax)[3]		Noise Level Standards Exceeded?[4]	
	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime
R1	42.5	41.5	80.0	60.0	No	No
R2	43.9	42.9	80.0	60.0	No	No
R3	43.5	42.5	80.0	60.0	No	No
R4	51.0	48.6	80.0	60.0	No	No
R5	48.0	46.4	80.0	60.0	No	No

[1] See Exhibit 9-A for the receiver locations.
[2] Proposed Project operational noise levels as shown on Table 10-1.
[3] City of Perris Municipal Code, Section 7.34.060 (Appendix 3.1)
[4] Do the estimated Project operational noise source activities exceed the noise level standards?
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

10.6 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 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. (4) 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 level increases are assessed at location where existing receivers would experience an increase in ambient noise levels. As indicated on Table 10-5, the Project will generate an unmitigated daytime operational noise level increase ranging from 0.0 to 0.9 dBA L_{max} at the nearest receiver locations. Project-related daytime operational noise level increases are predicted to satisfy the noise level increase significance criteria presented on Table 4-1. Table 10-6 shows that the Project will generate an unmitigated nighttime operational noise level increase ranging from 0.0 to 0.7 dBA L_{max} at the nearest receiver locations. Therefore, the incremental Project operational noise level increases are considered *less than significant* at all receiver locations.

TABLE 10-5: DAYTIME PROJECT OPERATIONAL NOISE LEVEL INCREASES

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Increase Criteria	Increase Criteria Exceeded?
R1	42.5	L1	74.2	74.2	0.0	1.5	No
R2	43.9	L2	71.5	71.5	0.0	1.5	No
R3	43.5	L3	70.4	70.4	0.0	1.5	No
R4	51.0	L4	63.1	63.4	0.3	3.0	No
R5	48.0	L5	54.3	55.2	0.9	5.0	No

[1] See Exhibit 10-A for the receiver locations.
[2] Total Project daytime operational noise levels as shown on Table 10-2.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed daytime ambient noise levels as shown on Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.

TABLE 10-6: NIGHTTIME OPERATIONAL NOISE LEVEL INCREASES

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Increase Criteria	Increase Criteria Exceeded?
R1	41.5	L1	74.2	74.2	0.0	1.5	No
R2	42.9	L2	71.5	71.5	0.0	1.5	No
R3	42.5	L3	70.4	70.4	0.0	1.5	No
R4	48.6	L4	63.1	63.3	0.2	3.0	No
R5	46.4	L5	54.3	55.0	0.7	5.0	No

[1] See Exhibit 10-A for the receiver locations.
[2] Total Project nighttime operational noise levels as shown on Table 10-3.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed nighttime ambient noise levels as shown on Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.

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11 CONSTRUCTION ANALYSIS

This section analyzes potential impacts resulting from the short-term construction activities associated with the development of the Project. Exhibit 11-A shows the construction activity boundaries in relation to the nearby sensitive receiver locations previously described in Section 8. City of Perris Municipal Code Section 7.34.060, states that the permitted hours of construction activity are 7:00 a.m. to 7:00 p.m. on any day except Sundays and legal holidays (with the exception of Columbus Day and Washington's birthday) and that the noise level standard of 80 dBA L_{max} at residential properties shall apply to the noise-sensitive receiver locations located in the City of Perris.

If Project construction activity occurs outside of the hours specified in the Municipal Code, noise levels shall satisfy the City of Perris construction noise level thresholds of 80 dBA L_{max} during construction activity.

11.1 CONSTRUCTION NOISE LEVELS

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

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

11.2 CONSTRUCTION REFERENCE NOISE LEVELS

To describe peak construction noise activities, this construction noise analysis was prepared using reference noise level measurements published in the *Road Construction Noise Model* (RCNM) by the Federal Highway Administration (FHWA) (27). The FHWA model provides a comprehensive source of reference construction noise levels. Table 11-1 provides a summary of the RCNM construction reference noise level measurements expressed in hourly average dBA L_{max} using the estimated RCNM usage factors (27) to describe the construction activities for each stage of Project construction.

EXHIBIT 11-A: CONSTRUCTION NOISE SOURCE AND RECEIVER LOCATIONS

TABLE 11-1: TYPICAL CONSTRUCTION REFERENCE NOISE LEVELS

Construction Stage	Reference Construction Equipmnet[1]	Reference Noise Level @ 50 Feet (dBA L_{max})	Highest Reference Noise Level (dBA L_{max})	Reference Power Level (dBA L_w)
Site Preparation	Dozer	82.0	82.0	113.6
	Backhoe	78.0		
	Front End Loader	79.0		
Grading	Scraper	84.0	85.0	116.6
	Grader	85.0		
	Compactor (ground)	83.0		
Building Construction	Gradall	83.0	83.0	114.6
	Generator	81.0		
	Crane	81.0		
Paving	Paver	77.0	80.0	111.6
	Dump Truck	76.0		
	Roller	80.0		
Architectural Coating	Man Lift	75.0	78.0	109.6
	Compressor (air)	78.0		
	Pickup Truck	75.0		

[1] FHWA Road Construction Noise Model, 2006.

11.3 TYPICAL CONSTRUCTION NOISE ANALYSIS

Table 11-2 shows the Project construction equipment reference noise levels used in this analysis and the resulting Project-related construction noise levels at each receiver location when the highest reference noise level is operating at a single point nearest each sensitive receiver location. Table 11-2 shows that the Project-related construction noise levels will range from 59.3 to 74.7 dBA L_{max} at the sensitive receiver locations in the City of Perris.

11.4 TYPICAL CONSTRUCTION NOISE LEVEL COMPLIANCE

To evaluate whether the Project will generate potentially significant short-term noise levels at nearest residential receiver locations, a construction-related daytime noise level threshold of 80 dBA L_{max} is used as the City's threshold to assess the daytime construction noise level impacts. The construction noise analysis shows that the nearest residential receiver locations will satisfy the daytime 80 dBA L_{max} significance threshold during Project construction activities as shown on Table 11-3. Therefore, the noise impacts due to Project construction noise is considered *less than significant*.

TABLE 11-2: CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

Receiver Location[1]	Construction Noise Levels (dBA L_{max})					
	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Highest Levels[2]
R1	64.4	67.4	65.4	62.4	60.4	67.4
R2	65.0	68.0	66.0	63.0	61.0	68.0
R3	63.3	66.3	64.3	61.3	59.3	66.3
R4	71.6	74.6	72.6	69.6	67.6	74.6
R5	71.7	74.7	72.7	69.7	67.7	74.7

[1] Noise receiver locations are shown on Exhibit 11-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 construction noise model inputs are included in Appendix 11.1.

TABLE 11-3: TYPICAL CONSTRUCTION NOISE LEVEL COMPLIANCE

Receiver Location[1]	Construction Noise Levels (dBA L_{max})			
	Highest Construction Noise Levels[2]	Land Use	Threshold[3]	Threshold Exceeded?[4]
R1	67.4	Residential	80	No
R2	68.0	Residential	80	No
R3	66.3	Residential	80	No
R4	74.6	Residential	80	No
R5	74.7	Residential	80	No

[1] Noise receiver locations are shown on Exhibit 11-A.
[2] Highest construction noise level operating at the Project site boundary to nearby receiver locations (Table 11-2).
[3] City of Perris, Section 7.34.060
[4] Do the estimated Project construction noise levels exceed the construction noise level threshold?

11.5 TYPICAL CONSTRUCTION VIBRATION ANALYSIS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods employed. Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Ground vibration levels associated with various types of construction equipment are summarized on Table 11-4. Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the potential for building damage using the following vibration assessment methods defined by the Caltrans. To describe the vibration impacts the Caltrans provides the following equation: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$

TABLE 11-4: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

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

Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual

Table 11-5 presents the expected Project related vibration levels at the nearest receiver locations. At distances ranging from 1 to 118 feet from Project construction activities, construction vibration velocity levels are estimated to range from less than 0.01 to 11.13 PPV (in/sec). Based on maximum acceptable continuous vibration threshold of 0.30 PPV (in/sec) for older residential buildings, the typical Project construction vibration levels will not satisfy the City of Murrieta thresholds at two receiver locations, R4 and R5, and vibration impacts would be significant without mitigation. Therefore, mitigation measure (MM) Noise-1 is recommended to be included in Project construction plans to limit the equipment that would operate along the southern property line. With implementation of mitigation measure MM Noise-1, vibration level would be reduced to a less than significant level.

MM Noise-1: Large loaded trucks and dozers (greater than or equal to 80,000 pounds) (3) shall not be used within 15 feet of the southern Property line, as shown on Exhibit ES-A. Instead, smaller, rubber-tired bulldozers (less than 80,000 pounds) shall be used within this area during Project construction to reduce vibration effects.

TABLE 10-5: CONSTRUCTION EQUIPMENT VIBRATION LEVELS

Receiver 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	Highest Vibration Level		
R1	62'	0.00	0.01	0.02	0.02	0.02	0.30	No
R2	58'	0.00	0.01	0.02	0.03	0.03	0.30	No
R3	118'	0.00	0.00	0.01	0.01	0.01	0.30	No
R4	1'	0.38	4.38	9.50	11.13	11.13	0.30	**Yes**
R5	1'	0.38	4.38	9.50	11.13	11.13	0.30	**Yes**

[1] Construction receiver locations are shown on Exhibit 11-A.
[2] Distance from receiver location to Project construction boundary.
[3] Based on the Vibration Source Levels of Construction Equipment (Table 11-4).
[4] Caltrans Transportation and Construction Vibration Guidance Manual, April 2020, Tables 19, p. 38
[5] Does the peak vibration exceed the acceptable vibration thresholds?
"PPV" = Peak Particle Velocity

12 REFERENCES

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13 CERTIFICATION

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed Evans Road and Rider Street Multi-Family Housing 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 (619) 788-1971.

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EDUCATION

Bachelor of Science in Urban and Regional Planning
California Polytechnic State University, Pomona • June 2000

PROFESSIONAL AFFILIATIONS

ASA – Acoustical Society of America
APA – American Planning Association
AWMA – Air and Waste Management Association

PROFESSIONAL CERTIFICATIONS

Approved Acoustical Consultant • County of San Diego
FHWA Traffic Noise Model of Training • November 2004
CadnaA Basic and Advanced Training Certificate • October 2008.

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APPENDIX 3.1:

CITY OF PERRIS MUNICIPAL CODE

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CHAPTER 7.34. - NOISE CONTROL

Sec. 7.34.010. - Declaration of policy.

Excessive noise levels are detrimental to the health and safety of individuals. Noise is considered a public nuisance, and the city discourages unnecessary, excessive or annoying noises from all sources. Creating, maintaining, causing, or allowing to be created, caused or maintained, any noise or vibration in a manner prohibited by the provisions of the ordinance codified in this chapter is a public nuisance and shall be punishable as a misdemeanor.

(Code 1972, § 7.34.010; Ord. No. 1082, § 2(part), 2000)

Sec. 7.34.020. - Definitions.

(a) *General.* The following words, terms and phrases, when used in this chapter, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

Ambient noise means the all-encompassing noise associated with a given environment usually being composed of sounds from many sources near and far. For the purpose of this chapter, ambient noise level is the level obtained when the noise level is averaged over a period of five minutes without inclusion of noise from isolated identifiable sources at the location and time of day near that at which a comparison is to be made.

Decibel (dB) means an intensity unit which denotes the ratio between two quantities which are proportional to power; the number of decibels corresponding to the ratio is ten times the common logarithm of this ratio.

Sound amplifying equipment means any machine or device for the amplification of the human voice, music or any other sound. The term "sound amplifying equipment" does not include standard vehicle radios when used and heard only by the occupants of the vehicle in which the vehicle radio is installed. The term "sound amplifying equipment," as used in this chapter, does not include warning devices on any vehicle used only for traffic safety purposes and shall not include communications equipment used by public or private utilities when restoring utility service following a public emergency or when doing work required to protect person or property from an imminent exposure to danger.

Sound level (noise level) in decibels is the value of a sound measurement using the "A" weighting network of a sound level meter. Slow response of the sound level meter needle shall be used except where the sound is impulsive or rapidly varying in nature, in which case, fast response shall be used.

Sound level meter means an instrument, including a microphone, an amplifier, an output meter and frequency weighting networks, for the measurement of sound levels, which satisfies the pertinent requirements in American National Standards Institute's specification S1.4-1971 or the most recent revision for type S-2A general purpose sound level meters.

(b) *Supplementary definitions of technical terms.* Definitions of technical terms not defined in this section shall be obtained from the American National Standards Institute's Acoustical Terminology S1-1971 or the most recent revision thereof.

(Code 1972, § 7.34.020; Ord. No. 1082, § 2(part), 2000)

Sec. 7.34.030. - Measurement methods.

(a) Sound shall be measured with a sound level meter as defined in section 7.34.020.

(b) Unless otherwise provided, outdoor measurements shall be taken with the microphone located at any point on the property line of the noise source but no closer than five feet from any wall or vertical obstruction and three to five feet above ground level whenever possible.

(c) Unless otherwise provided, indoor measurements shall be taken inside the structure with the microphone located at any point as follows:

(1) No less than three feet above floor level;

(2) No less than five feet from any wall or vertical obstruction; and

(3) Not under common possession and control with the building or portion of the building from which the sound is emanating.

(Code 1972, § 7.34.030; Ord. No. 1082, § 2(part), 2000)

Sec. 7.34.040. - Sound amplification.

No person shall amplify sound using sound amplifying equipment contrary to any of the following:

(1) The only amplified sound permitted shall be either music or the human voice, or both.

(2) The volume of amplified sound shall not exceed the noise levels set forth in this subsection when measured outdoors at or beyond the property line of the property from which the sound emanates.

Time Period	Maximum Noise Level
10:01 p.m.—7:00 a.m.	60 dBA
7:01 a.m.—10:00 p.m.	80 dBA

(Code 1972, § 7.34.040; Ord. No. 1082, § 2(part), 2000)

Sec. 7.34.050. - General prohibition.

(a) It unlawful for any person to willfully make, cause or suffer, or permit to be made or caused, any loud excessive or offensive noises or sounds which unreasonably disturb the peace and quiet of any residential neighborhood or which are physically annoying to persons of ordinary sensitivity or which are so harsh, prolonged or unnatural or unusual in their use, time or place as to occasion physical discomfort to the inhabitants of the city, or any section thereof. The standards for dBA noise level in section 7.34.040 shall apply to this section. To the extent that the noise created causes the noise level at the property line to exceed the ambient noise level by more than 1.0 decibels, it shall be presumed that the noise being created also is in violation of this section.

(b) The characteristics and conditions which should be considered in determining whether a violation of the provisions of this section exists should include, but not be limited to, the following:

(1) The level of the noise;

(2) Whether the nature of the noise is usual or unusual;

(3) Whether the origin of the noise is natural or unnatural;

(4) The level of the ambient noise;

(5) The proximity of the noise to sleeping facilities;

(6) The nature and zoning of the area from which the noise emanates and the area where it is received;

(7) The time of day or night the noise occurs;

(8) The duration of the noise; and

(9) Whether the noise is recurrent, intermittent or constant.

(Code 1972, § 7.34.050; Ord. No. 1082, § 2(part), 2000)

Sec. 7.34.060. - Construction noise.

It is unlawful for any person between the hours of 7:00 p.m. of any day and 7:00 a.m. of the following day, or on a legal holiday, with the exception of Columbus Day and Washington's birthday, or on Sundays to erect, construct, demolish, excavate, alter or repair any building or structure in such a manner as to create disturbing, excessive or offensive noise. Construction activity shall not exceed 80 dBA in residential zones in the city.

(Code 1972, § 7.34.060; Ord. No. 1082, § 2(part), 2000)

Sec. 7.34.070. - Refuse vehicles and parking lot sweepers.

No person shall operate or permit to be operated a refuse compacting, processing or collection vehicle or parking lot sweeper between the hours of 7:00 p.m. to 7:00 a.m. in any residential area unless a permit has been applied for and granted by the city.

(Code 1972, § 7.34.070; Ord. No. 1082, § 2(part), 2000)

Sec. 7.34.080. - Disturbing, excessive, offensive noises; declaration of certain acts constituting.

The following activities, among others, are declared to cause loud, disturbing, excessive or offensive noises in violation of this section and are unlawful, namely:

(1) *Horns, signaling devices, etc.* Unnecessary use or operation of horns, signaling devices or other similar devices on automobiles,

motorcycles or any other vehicle.

(2) *Radios, television sets, phonographs, loud speaking amplifiers and similar devices.* The use or operation of any sound production or reproduction device, radio receiving set, musical instrument, drums, phonograph, television set, loudspeakers, sound amplifier, or other similar machine or device for the producing or reproducing of sound, in such a manner as to disturb the peace, quiet or comfort of any reasonable person of normal sensitivity in any area of the city is prohibited. This provision shall not apply to any participant in a licensed parade or to any person who has been otherwise duly authorized by the city to engage in such conduct.

(3) *Animals.*

a. The keeping or maintenance, or the permitting to be kept or maintained, upon any premises owned, occupied or controlled by any person of any animal or animals which by any frequent or long-continued noise shall cause annoyance or discomfort to a reasonable person of normal sensitiveness in the vicinity.

b. The noise from any such animal or animals that disturbs two or more residents residing in separate residences adjacent to any part of the property on which the subject animal or animals are kept or maintained, or three or more residents residing in separate residences in close proximity to the property on which the subject animal or animals are kept or maintained, shall be prima facie evidence of a violation of this section.

(4) *Hospitals, schools, libraries, rest homes, long-term medical or mental care facilities.* To make loud, disturbing, excessive noises adjacent to a hospital, school, library, rest home or long-term medical or mental care facility, which noise unreasonably interferes with the workings of such institutions or which disturbs or unduly annoys occupants in said institutions.

(5) *Playing of radios on buses and trolleys.* The operation of any radio, phonograph or tape player on an urban transit bus or trolley so as to emit noise that is audible to any other person in the vehicle is prohibited.

(6) *Playing of radios, phonographs and other sound production or reproduction devices in public parks and public parking lots and streets adjacent thereto.* The operation of any radio, phonograph, television set or any other sound production or reproduction device in any public park or any public parking lot, or street adjacent to such park or beach, without the prior written approval of the city manager or the administrator, in such a manner that such radio, phonograph, television set or sound production or reproduction device emits a sound level exceeding those found in the table in section 7.34.040.

(7) *Leaf blowers.*

a. The term "leaf blower" means any portable, hand-held or backpack, engine-powered device with a nozzle that creates a directable airstream which is capable of and intended for moving leaves and light materials.

b. No person shall operate a leaf blower in any residential zoned area between the hours of 7:00 p.m. and 8:00 a.m. on weekdays and 5:00 p.m. and 9:00 a.m. on weekends or on legal holidays.

c. No person may operate any leaf blower at a sound level in excess of 80 decibels measured at a distance of 50 feet or greater from the point of noise origin.

d. Leaf blowers shall be equipped with functional mufflers and an approved sound limiting device required to ensure that the leaf blower is not capable of generating a sound level exceeding any limit prescribed in this section.

(Code 1972, § 7.34.080; Ord. No. 1082, § 2(part), 2000)

Sec. 7.34.090. - Burglar alarms.

(a) Audible burglar alarms for structures or motor vehicles are prohibited unless the operation of such burglar alarm can be terminated within 20 minutes of being activated.

(b) Notwithstanding the requirements of this provision, any member of the county sheriff's department, Perris Division, shall have the right to take such steps as may be reasonable and necessary to disconnect any such alarm installed in any building, dwelling or motor vehicle at any time during the period of its activation. On or after 30 days from the effective date of the ordinance codified in this chapter, any building, dwelling or motor vehicle upon which a burglar alarm has been installed shall prominently display the telephone number at which communication may be made with the owner of such building, dwelling or motor vehicle.

(Code 1972, § 7.34.090; Ord. No. 1082, § 2(part), 2000)

Sec. 7.34.100. - Motor vehicles.

(a) Off-highway.

(1) Except as otherwise provided for in this chapter, it shall be unlawful to operate any motor vehicle of any type on any site, other than on a public street or highway as defined in the California Vehicle Code, in any manner so as to cause noise in excess of those noise levels permitted for on-highway motor vehicles as specified in the table for "45-mile-per-hour or less speed limits"

contained in section 23130 of the California Vehicle Code and as corrected for distances set forth in subsection (a)(2) of this section.

(2) The maximum noise level as the on-highway vehicle passes may be measured at a distance of other than 50 feet from the centerline of travel, provided the measurement is further adjusted by adding algebraically the application correction as follows:

Distance (feet)	Correction (decibels)
25	−6
28	−5
32	−4
35	−3
40	−2
45	−1
50 (preferred distance)	0
56	+1
63	+2

70	+3
80	+4
90	+5
100	+6

(b) Nothing in this section shall apply to authorized emergency vehicles when being used in emergency situations including the blowing of sirens and/or horns.

(Code 1972, § 7.34.100; Ord. No. 1082, § 2(part), 2000)

CHAPTER 16.22. - CONSTRUCTION LOCATED NEAR ARTERIALS, RAILROADS AND AIRPORTS

Sec. 16.22.010. - Purpose.

The purpose of this chapter is to establish standards of insulation against noise for areas in the vicinity of arterials, railroads, and airports where the exterior community noise equivalent level (CNEL) exceeds 60 dB. Residential developments such as noise impacted areas shall be designed and constructed so as to isolate them appropriately from the interior noise exposures produced by arterial traffic, train pass-bys, and aircraft operations.

(Code 1972, § 16.22.010; Ord. No. 684, § 1(part), 1987)

Sec. 16.22.020. - Definitions.

The following words, terms and phrases, when used in this chapter, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

Ambient noise means the composite noise from all sources near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

A-weighted sound pressure level, db(A) means the sound pressure level, in decibels, as measured on a sound level meter using the A-weighting filter network. The A-weighting filter deemphasizes the very low and very high frequency components of the sound in a manner similar to the response to the human ear and gives good correlation with subjective reactions to noise.

Community noise equivalent level (CNEL) means a measure of noise exposure which recognizes that a given level of noise may be more or less tolerable depending on the duration of exposure and the time of day during which the noise is experienced. This measure weights the average noise level for the evening hours (7:00 p.m. to 10:00 p.m.) by five dB, and the late evening and early morning hours (10:00 p.m. to 7:00 a.m.) by ten dB. The unweighted daytime noise levels are combined with these weighted levels and averaged to obtain a CNEL value.

Decibel (dB) means a unit for describing the amplitude of sound, equal to 20 times the logarithm to the base ten of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals.

Maximum noise level means the maximum instantaneous noise level that occurs during a specific time interval. In acoustics, the maximum sound pressure level is understood to be for single events unless some other kind of level is specified.

Noise means annoying, harmful, or unwanted sound.

Noise contour means a line drawn about a noise source indicating constant levels of noise exposure. CNEL is the metric utilized herein to describe community exposure to noise.

Noise impact area means a specific area exposed to significant levels of noise.

Noise level reduction (NLR) means the difference in noise level from outside to inside of the building. NLR is a difference, in decibels, between A-weighted sound level. It depends primarily on the nature of the wall, ceiling, windows, doors, and vents, and to a lesser extent on the amount of sound absorbing material in the room in which the sound is received. It shall be measured, if so required, in a completed and furnished building.

Noise-sensitive land uses include, but are not limited to, residences, schools, libraries, hospitals, churches, offices, hotels, motels, and outdoor recreational areas. Noise-sensitivity factors include interference with speech communication, subjective judgment of noise acceptability and relative noisiness, priced for freedom from noise intrusion, and sleep interference criteria.

Qualified consultant means a person who by reason of his training and experience in the science and technology of acoustical engineering is considered qualified to pass judgment on acoustical design, materials, and methods of construction for the attenuation of noise. The qualifications of the consultant relative to acoustical design must be submitted to and found to be acceptable by the city and the state office of noise control.

Sound absorption means the capacity of the materials and furnishings in a habitable room to absorb sound.

Sound level means, in decibels, the quantity measured by an instrument that satisfies American National Standards Specification for Sound Level Meters 51.4-1971 or the most recent revision thereof. Sound level is understood to be measured with the A-weighted filter and slow response of the instrument.

Sound level meter means a measurement instrument containing a microphone, an amplifier, an output meter, and one or more frequency weighting networks. It is used for the determination of sound levels.

Sound transmission class (STC) of a partition means a single-figure rating of the sound insulating properties of a partition which takes into account the relative importance of the sound transmission loss of the partition at different frequencies. The determination of the sound transmission class of a partition is described in "Determination of Sound Transmission Class," American Society for Testing and Materials Designation E413-73.

Sound transmission loss of a partition means a measure of the sound insulating properties of a wall, floor, ceiling, window, or door that is a characteristic of the partition itself and not the room of which it is a part. The determination of sound transmission loss of a partition of the field is described in "Measurement of Airborne Sound Insulation in Buildings," American Society for Testing and Materials Designation E336-77 or the latest revision thereof.

(Code 1972, § 16.22.020; Ord. No. 684, § 1(part), 1987)

Sec. 16.22.030. - Noise impacted projects.

Residential projects, or portions thereof, which are exposed to a community noise equivalent level (CNEL) of 60 dB or greater are considered to be impacted by excessive noise. Such projects shall be required to include noise isolation design and construction such that the exterior and interior noise standards of the city's noise element of its general plan are not exceeded. Year 2000 CNEL contour maps maintained by the city's planning department shall be used to identify those areas in proximity to arterials, railroads, and/or airfields that are impacted by a CNEL which is 60 dB or greater.

(Code 1972, § 16.22.030; Ord. No. 684, § 1(part), 1987)

Sec. 16.22.040. - Acceptable building construction.

Residential development will be considered acceptable by the city's building official for mitigating interior noise exposures if it incorporates the features described in section 16.22.060. Alternative materials and methods of construction may be permitted provided such alternatives are demonstrated to the satisfaction of the city's building official to be equivalent to those described in this chapter.

(Code 1972, § 16.22.040; Ord. No. 684, § 1(part), 1987)

Sec. 16.22.050. - Acoustical analysis and design report.

An analysis and design report signed by and prepared under the supervision of a qualified architect or engineer shall be submitted with the application for building permits. The report shall comply with the requirements of section 16.22.070 and shall identify the noise sources and characteristics, provide the predicted noise spectra, indicate the basis for the prediction (measured or obtained from published data), and quantify the effectiveness of the proposed building construction to ensure that the CNEL standard of 45 dB is met within the interior living spaces. In the event that the analysis and design report includes a challenge of the AICUZ noise contours for March Air Force Base, it shall also comply with the requirements and procedures for a challenge study, as established by resolution of the city council.

(Code 1972, § 16.22.050; Ord. No. 684, § 1(part), 1987)

Sec. 16.22.060. - Prescription for the control of aircraft noise within residential construction.

(a) All residential buildings located within a CNEL contour of 60 dB or greater shall be designed to cause isolation against exterior noise with at least a noise level reduction (NLR) that will reduce the exterior noise to an acceptable level. Residential buildings shall be constructed with sufficient sound insulation so that in any habitable room, furnished for normal use with doors and windows closed, the noise exposure due to exterior sources does not exceed a community noise equivalent level (CNEL) of 45 dB. The exterior CNEL at the project site shall be obtained from city approved noise contour maps.

(b) The minimum NLR required at any residential unit shall be determined as follows:

Range of Exterior CNEL	Minimum NLR
60—65 dB	20 dB
66—70 dB	25 dB
71—75 dB	30 dB
76 + dB	Not permitted

(c) The following tables specify the construction standards necessary to meet the minimum NLRs indicated above and the interior noise standards specified in the noise element of the city's general plan.

TABLE 1. CONSTRUCTION STANDARDS TO ACHIEVE
A NOISE LEVEL REDUCTION (NLR) OF 20 dB

Assembly	Construction Standards
Ventilation	Arrangements for any habitable room shall be such that any exterior door or window can be kept closed when the room is in use. A forced air circulation system shall be provided which will give a minimum of two complete air changes per hour, of which at least 20 percent is fresh air in accordance with the requirements of the Uniform Mechanical Code.
Glazing and Doors	All windows and sliding glass doors shall be doors tightly fitted assemblies, and all entry doors from exterior spaces shall be well weather-stripped. Air gaps and rattling shall not be permitted.

TABLE 2. CONSTRUCTION STANDARDS TO ACHIEVE
A NOISE LEVEL REDUCTION (NLR) OF 25 dB

Assembly	Construction
Exterior Walls	If wood construction is used, exterior walls shall be furnished on the outside with siding-on-sheathing, stucco, or brick veneer. The interior surface shall be at least one-half-inch gypsum board. Insulation having a minimum of R-11 shall be placed between the studs.

	Masonry walls, if used, shall have at least one surface of the wall plastered, painted, or covered with gypsum wallboard or approved materials.
	For mobile home construction, the interior surface shall have a minimum density of two psf and the exterior surface should have a minimum density of three psf. At least R-11 insulation shall be placed between the studs.
	There shall be no direct openings such as mail slots or ventilation units.
Glazing	All windows and sliding glass doors shall be well fitted, well weather-stripped assemblies and shall have a minimum STC of 32. Air gaps and rattling shall not be permitted.
	The total area of glass shall not exceed 20 percent of the floor area in any room.
Doors	All exterior doors shall be well weather-stripped solid core assemblies at least 1¾-inch thick.
Roof	Roof sheathing of wood construction shall be well fitted or caulked plywood of at least one-half inch thick. Ceilings shall be well fitted, well sealed gypsum board of at least one-half-inch thick.
	Insulation with at least a rating of R-19 shall be used in the attic space.
	For mobile home construction, the interior surface shall have a minimum density of two psf and the exterior surface shall have a minimum density of three psf. At least R-11 insulation shall be placed between the studs. Skylights shall have a minimum STC of 32.

Floor	For mobile home construction, the skirt shall extend to the ground and shall be of the same construction as the exterior walls. Any access doors or windows shall be tightly fitted and weather-stripped.
Ventilation	Arrangements for any habitable room shall be such that any exterior door or window can be kept closed when the room is in use. A forced air circulation system shall be provided which will give a minimum of two complete air changes per hour, of which at least 20 percent is fresh air per requirements of the Uniform Mechanical Code. Any air duct or connection to an outdoor elevation must contain an interior sound absorbent lining which is at least acoustically equivalent to one-inch thick fiberglassed duct liner. The liner shall be five times greater in length than the diameter of the duct. All such ducts shall contain a bend which eliminates the line-of-sight to the outside. All fireplaces shall be provided with a well-fitted damper.
Furnishings	All rooms, when in use, are expected to contain furniture or other materials that absorb sound equivalent to the absorption provided by wall-to-wall carpeting over a conventional pad.

TABLE 3. CONSTRUCTION STANDARDS TO ACHIEVE
A NOISE LEVEL REDUCTION (NLR) OF 30 dB

Assembly	Construction Standards

Exterior Walls	If wood construction is used, exterior walls shall be finished on the outside with siding-on-sheathing, stucco, or brick veneer. The interior surfaces shall be at least one-half inch gypsum board. Insulation having a minimum value of R-11 shall be placed between the studs.
	Masonry walls, if used, shall have at least one surface of the wall plastered, painted, or covered with gypsum wallboard or approved material.
	The surface weight of the wall should be at least 40 psf. For mobile home construction, the interior surface shall have a minimum density of two psf and the exterior surface shall have a minimum density of five psf. At least R-11 insulation shall be placed between the studs.
	There shall be no direct openings such as mail slots or ventilation units.
Glazing	All windows and sliding glass doors shall be well fitted, well weather-stripped assemblies and shall have a minimum STC of 38. Air gaps and rattling shall not be permitted. The total area of glass shall not exceed 20 percent of the floor area within any room.
Doors	All exterior doors shall be well weather-stripped solid core assemblies at least 1¾-inch thick.
Roof	Roof sheathing of wood construction shall be well fitted or caulked plywood at least one-half-inch thick. Ceiling shall be well fitted, well-sealed gypsum board of at least one-half-inch thick. For mobile home construction, the interior surface shall have a minimum density of five psf. At least R-11 insulation shall be placed between the studs. Insulation with at least a rating of R-19 shall be used in the attic space. Skylights shall have a minimum SW of 38.

Floor	The floor of the lowest occupied room shall be concrete slab or shall be well sealed against the noise intrusion. For mobile home construction, the skirt shall extend to the ground and shall be the same construction as the exterior walls. Any access doors or windows shall be tightly fitted and weather-stripped.
Ventilation	Arrangements for any habitable room shall be such that any exterior door or window can be kept closed when the room is in use. A forced air circulation system shall be provided which will give a minimum of two complete air changes per hour, of which at least 20 percent is fresh air in accordance with the requirements of the Uniform Mechanical Code. Any air duct or connection to an outdoor elevation must contain an interior sound absorbent lining which is at least acoustically equivalent to one-inch thick fiberglass duct liner. The liner shall be five times greater in length than the diameter of the duct. All such ducts shall contain a bend which eliminates the line-of-sight to the outside. Fireplaces shall not be permitted.
Furnishings	All rooms, when in use, are expected to contain furniture or other materials that absorb sound equivalent to the absorption provided by wall-to-wall carpeting over a conventional pad.

(Code 1972, § 16.22.060; Ord. No. 684, § 1(part), 1987)

Sec. 16.22.070. - Requirements for acoustical analysis reports.

(a) Acoustical analysis reports shall be prepared for all residential projects for approval by the city's planning department. Such reports shall describe the exterior noise environment in detail and, as necessary, propose measures to satisfy both interior and exterior noise level criteria. The acoustical consultant shall uniquely identify each acoustical report by a report number and certify

that the report is true and accurate. Each report shall include the following:

(1) A city-issued project identification number (e.g., use permit, site plan, tentative tract, parcel map, etc.);

(2) A street address if one has been assigned;

(3) A vicinity map clearly showing the site for the development;

(4) The conditions of approval applied to the project by the city, in their entirety. (This will notify the consultant if any special modifications were made in the standard conditions of the approval);

(5) A legible plot plan and floor plan at a scale not less than one inch equals 40 feet, folded in an 8½-inch by 11-inch format. The scale is to ensure that distance can be accurately determined and that the exhibit is legible.

(b) The acoustical report shall also state the methodology used for measurement or prediction of motor vehicular noise levels. The procedures in FHWA-RD-77-108, as modified for CNEL, shall be used for traffic noise prediction, with all variables identified and justified where appropriate (e.g., absorptive (soft) or reflective (hard); gradient; stop-and-go conditions; number and width of travel lanes and medians, etc.).

(1) Vehicle speeds, ADTs and traffic mix, per level of service "C," shall be stated and source of information identified.

(2) Equivalent distance, per the FHWA model for calculations of noise impact shall be used.

(3) The centerline of the roadway shall be used for reference distance to observer, structure, etc., not the centerline of the near travel lane for reference.

(4) No credit shall be given for future quieting of motor vehicle noise sources.

(5) CNEL shall be used.

(6) On-site measurement data, if used to validate the predicted noise levels for an acoustical analysis, shall be adjusted to reflect the annualized ADT for the site prior to determination of existing noise impact levels. The dates, times and exact locations of the measurements shall be stated.

(c) Where applicable a detailed barrier analysis shall be submitted with the report, including:

(1) Locations of barriers, usable outdoor living area, etc.;

(2) Worst-case section view of site, including elevations, either scaled or dimensioned;

(3) Barrier geometry (NOTE: Five-foot observer height above datum and source heights per the FHWA model shall be used.);

(4) Discussion of the structural details required to maintain acoustical integrity of the barrier, including treatment of penetrations, gates, etc.

(d) If railroad or aircraft noise affects the site, measurement of noise impact or the method of prediction shall be stated. Where city developed or approved CNEL contour maps are available, their use may be required by the city. If railroad or aircraft noise does not affect the site, so state.

(e) Each report shall further:

(1) Indicate in tabular form the required sound transmission loss of windows, along with typical thickness and configuration, required to satisfy thickness and configuration, required to satisfy city standards for interior noise levels. When specifying windows of greater than 3/16 -inch thickness, list one or more products by manufacturer's name and model number that will satisfy the acoustical requirements.

(2) Include a summary section on colored paper in which specifications and location of all sound attenuating design features or products shall be listed, preferably in a tabular form.

(3) Include worksheets for composite wall analyses including transmission loss assumptions, unless the prescriptive A-weighted insertion losses of 20 dB (windows closed) or 12 dB (windows open) are used.

(4) Specify in text of report which residential structures and units, if any, require closed windows to meet interior noise standards and in such cases, include the following paragraph:

Where windows are required to be openable or kept closed in order to meet the interior noise standards, mechanical ventilation and cooling, if necessary, shall be provided to maintain a habitable environment. The system shall supply two air changes per hour to each habitable room including 20 percent fresh make-up air obtained directly from the outdoors. The fresh air inlet duct shall be of sound attenuating construction and shall consist of a minimum of ten feet plus one sharp 90-degree bend.

(5) State the requirements for maintaining building shell acoustical integrity and enumerate items of a critical nature: e.g., tight-fit chimney damper, exhaust fan backdraft damper, no mail slot, full skirting for mobile home coaches, air-conditioning intake and exhaust ducting, etc. A through-the-wall air-conditioner shall be treated as a separate component when calculating composite wall attenuation values.

(f) The following CNEL data shall be provided as appropriate:

(1) Existing and future CNEL, before mitigation;

(2) Worst case outdoor living area CNEL, before mitigation;

(3) Worst-case CNEL incident upon structure prior to mitigation; and

(4) Worst-case interior CNEL after mitigation by building components and/or exterior barriers.

(Code 1972, § 16.22.070; Ord. No. 684, § 1(part), 1987)

APPENDIX 5.1:

NOISE MEASUREMENT PHOTOS

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JN: 14505 Study Area Photos

L1_E
33, 49' 49.120000"117, 12' 31.160000"

L1_N
33, 49' 49.110000"117, 12' 31.250000"

L1_S
33, 49' 49.080000"117, 12' 31.190000"

L1_W
33, 49' 49.120000"117, 12' 31.160000"

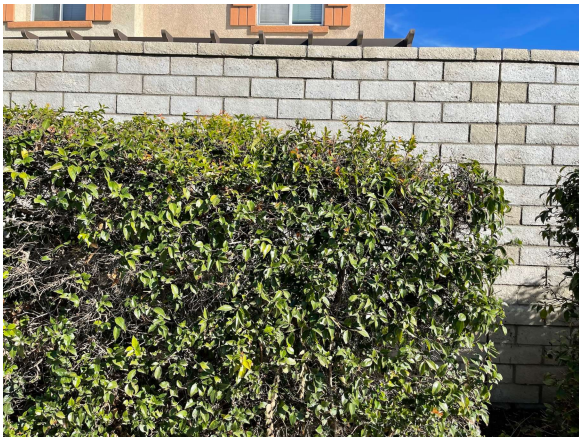
L2_E
33, 49' 49.280000"117, 12' 17.240000"

L2_N
33, 49' 49.420000"117, 12' 17.400000"

JN: 14505 Study Area Photos

L2_S
33, 49' 49.320000"117, 12' 17.270000"

L2_W
33, 49' 49.230000"117, 12' 17.180000"



L3_E
33, 49' 45.730000"117, 12' 14.600000"

L3_N
33, 49' 45.740000"117, 12' 14.660000"

L3_S
33, 49' 45.710000"117, 12' 14.660000"

L3_W
33, 49' 45.740000"117, 12' 14.600000"

JN: 14505 Study Area Photos

L4_E
33, 49' 43.420000"117, 12' 15.810000"

L4_N
33, 49' 43.430000"117, 12' 15.840000"

L4_S
33, 49' 43.430000"117, 12' 15.840000"

L4_W
33, 49' 43.390000"117, 12' 15.840000"

L5_E
33, 49' 43.420000"117, 12' 31.160000"

L5_N
33, 49' 43.380000"117, 12' 31.160000"

JN: 14505 Study Area Photos

L5_S
33, 49' 43.390000"117, 12' 31.190000"

L5_W
33, 49' 43.410000"117, 12' 31.160000"

APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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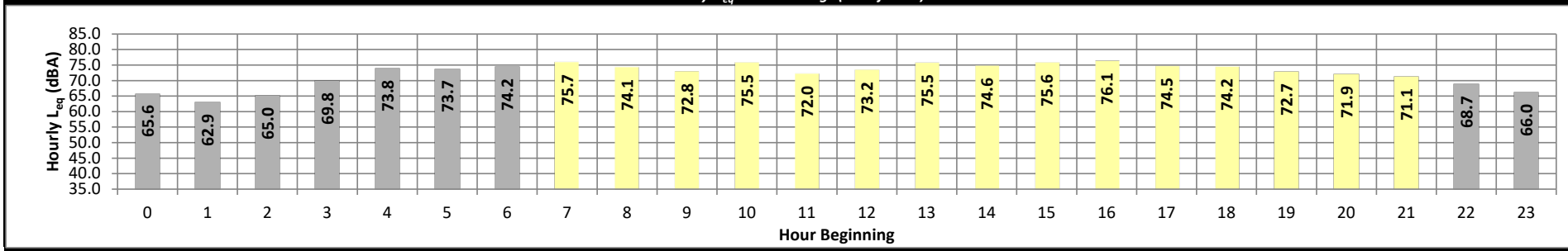
24-Hour Noise Level Measurement Summary

Date: Thursday, December 16, 2021 *Location:* L1 - Located northwest of the Project site near single-family *Meter:* Piccolo II *JN:* 14505

Project: Perris Residential *Source:* residence at 805 Finnegan Way. *Analyst:* A. Khan

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	65.6	76.6	47.9	76.1	75.2	72.9	71.1	65.2	55.9	49.8	48.8	48.0	65.6	10.0	75.6
	1	62.9	75.3	46.5	74.7	73.6	70.7	68.2	59.5	53.3	47.6	47.1	46.6	62.9	10.0	72.9
	2	65.0	77.7	47.3	77.1	76.0	72.8	70.1	60.9	54.0	48.3	47.8	47.4	65.0	10.0	75.0
	3	69.8	81.4	50.7	80.7	79.5	76.7	75.0	69.2	63.9	52.6	51.5	50.9	69.8	10.0	79.8
	4	73.8	84.4	58.9	83.7	82.4	80.1	78.8	74.4	69.0	60.6	59.7	59.1	73.8	10.0	83.8
	5	73.7	84.2	58.2	83.5	82.5	79.9	78.4	74.1	68.9	61.2	59.9	58.5	73.7	10.0	83.7
	6	74.2	84.6	60.0	84.0	82.9	80.2	78.8	74.8	70.1	62.1	60.9	60.1	74.2	10.0	84.2
Day	7	75.7	82.9	63.0	82.3	81.5	80.2	79.5	77.2	74.3	66.6	64.8	63.3	75.7	0.0	75.7
	8	74.1	82.1	60.7	81.5	80.7	79.1	78.3	75.5	72.1	63.9	62.2	60.8	74.1	0.0	74.1
	9	72.8	84.0	56.4	83.3	82.1	78.7	77.2	73.1	68.6	59.0	57.5	56.6	72.8	0.0	72.8
	10	75.5	88.3	55.4	87.4	85.6	81.6	80.5	74.4	68.8	58.9	57.3	55.6	75.5	0.0	75.5
	11	72.0	82.8	55.2	82.0	80.9	78.1	76.6	72.4	67.7	57.9	56.5	55.4	72.0	0.0	72.0
	12	73.2	82.1	58.9	81.6	80.8	78.8	77.7	74.4	70.4	62.6	60.8	59.2	73.2	0.0	73.2
	13	75.5	87.2	58.6	86.6	85.1	81.6	79.1	75.2	71.7	62.3	60.3	58.9	75.5	0.0	75.5
	14	74.6	83.0	62.4	82.4	81.6	79.5	78.3	75.6	72.8	65.9	64.5	63.0	74.6	0.0	74.6
	15	75.6	85.4	63.4	84.9	83.9	81.0	79.1	76.0	73.4	66.8	65.2	63.7	75.6	0.0	75.6
	16	76.1	88.0	60.6	87.2	85.9	82.5	80.0	75.5	71.9	64.2	62.5	60.9	76.1	0.0	76.1
	17	74.5	85.1	58.8	84.5	83.4	80.4	78.7	74.6	71.3	62.7	60.7	59.0	74.5	0.0	74.5
	18	74.2	85.4	58.9	84.7	83.4	79.9	77.9	74.5	71.0	62.0	60.5	59.1	74.2	0.0	74.2
	19	72.7	83.1	57.4	82.4	81.2	78.4	77.0	73.2	69.1	60.6	59.0	57.5	72.7	5.0	77.7
	20	71.9	81.9	56.0	81.3	80.3	77.9	76.5	72.7	68.4	58.9	57.2	56.2	71.9	5.0	76.9
	21	71.1	81.7	53.8	81.0	79.9	77.5	76.1	71.4	65.9	57.1	55.5	54.1	71.1	5.0	76.1
Night	22	68.7	79.9	50.8	79.2	78.1	75.3	73.7	68.6	62.3	52.8	51.8	51.0	68.7	10.0	78.7
	23	66.0	77.2	47.2	76.6	75.7	73.3	71.5	65.3	58.5	48.7	47.8	47.3	66.0	10.0	76.0

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	71.1	81.7	53.8	81.0	79.9	77.5	76.1	71.4	65.9	57.1	55.5	54.1
	Max	76.1	88.3	63.4	87.4	85.9	82.5	80.5	77.2	74.3	66.8	65.2	63.7
Energy Average		74.2	Average:		83.5	82.4	79.7	78.2	74.4	70.5	62.0	60.3	58.9
Night	Min	62.9	75.3	46.5	74.7	73.6	70.7	68.2	59.5	53.3	47.6	47.1	46.6
	Max	74.2	84.6	60.0	84.0	82.9	80.2	78.8	74.8	70.1	62.1	60.9	60.1
Energy Average		70.6	Average:		79.5	78.4	75.8	74.0	68.0	61.8	53.7	52.8	52.1

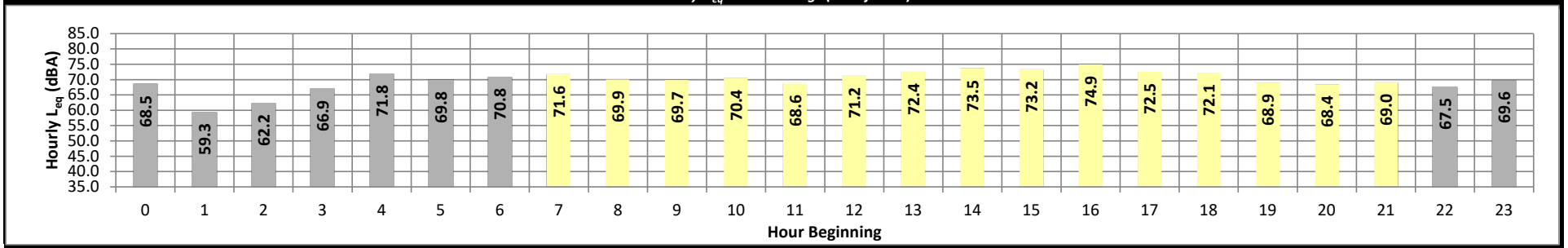
L_{eq} (dBA)		
24-Hour	Daytime (7am-10pm)	Nighttime (10pm-7am)
73.2	**74.2**	**70.6**

24-Hour Noise Level Measurement Summary

Date: Wednesday, December 15, 2021 *Location:* L2 - Located northeast of the Project site near single-family *Meter:* Piccolo II *JN:* 14505

Project: Perris Residential *Source:* residence at 985 Finnegan Way. *Analyst:* A. Khan

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	68.5	86.2	46.0	85.8	85.0	82.8	81.2	65.4	54.0	47.7	47.0	46.2	68.5	10.0	78.5
	1	59.3	71.3	42.1	70.9	70.1	67.6	65.1	55.1	48.9	43.4	42.9	42.2	59.3	10.0	69.3
	2	62.2	73.7	44.2	73.4	73.0	70.6	67.7	58.9	52.6	46.0	45.1	44.5	62.2	10.0	72.2
	3	66.9	80.1	48.5	79.6	78.4	74.5	71.6	63.0	57.9	50.4	49.3	48.6	66.9	10.0	76.9
	4	71.8	84.0	54.4	83.4	82.4	79.2	76.6	69.4	63.5	56.3	55.3	54.6	71.8	10.0	81.8
	5	69.8	81.9	55.5	81.4	80.1	77.1	74.9	68.2	63.5	57.4	56.4	55.7	69.8	10.0	79.8
	6	70.8	83.1	56.5	82.4	81.3	78.0	75.2	68.9	64.4	58.2	57.2	56.6	70.8	10.0	80.8
Day	7	71.6	81.8	60.2	81.4	80.6	78.2	76.0	71.1	68.1	62.6	61.4	60.4	71.6	0.0	71.6
	8	69.9	80.0	58.1	79.6	78.9	76.7	74.3	69.5	66.4	60.6	59.4	58.3	69.9	0.0	69.9
	9	69.7	80.8	54.4	80.4	79.8	78.0	75.8	67.4	63.0	56.4	55.4	54.5	69.7	0.0	69.7
	10	70.4	82.7	53.3	82.1	81.3	78.4	75.2	67.4	62.6	56.0	54.6	53.5	70.4	0.0	70.4
	11	68.6	80.0	52.6	79.5	78.9	76.5	74.0	66.6	62.0	55.3	54.0	52.8	68.6	0.0	68.6
	12	71.2	81.3	55.3	80.8	80.2	78.3	76.4	71.2	64.9	58.2	56.7	55.5	71.2	0.0	71.2
	13	72.4	84.1	57.8	83.6	82.7	80.0	77.7	69.9	65.8	60.4	59.2	58.1	72.4	0.0	72.4
	14	73.5	86.0	58.4	85.3	84.4	81.0	77.9	70.9	66.4	60.7	59.6	58.6	73.5	0.0	73.5
	15	73.2	84.2	60.2	83.7	83.2	80.9	78.4	71.0	67.4	62.5	61.5	60.5	73.2	0.0	73.2
	16	74.9	87.4	57.4	87.0	86.1	83.0	79.7	70.6	65.9	60.0	58.8	57.6	74.9	0.0	74.9
	17	72.5	84.4	57.3	83.9	83.3	80.6	77.6	69.4	65.6	59.8	58.6	57.6	72.5	0.0	72.5
	18	72.1	84.0	57.1	83.5	82.9	80.2	77.0	69.3	65.1	59.6	58.3	57.2	72.1	0.0	72.1
	19	68.9	80.3	55.4	79.7	78.8	75.6	73.4	67.9	63.8	57.6	56.5	55.6	68.9	5.0	73.9
	20	68.4	79.9	53.3	79.4	78.7	75.8	73.3	66.6	62.3	55.8	54.5	53.5	68.4	5.0	73.4
	21	69.0	81.4	52.3	81.0	80.1	76.8	73.8	65.5	61.0	54.6	53.4	52.6	69.0	5.0	74.0
Night	22	67.5	80.0	50.0	79.4	78.5	75.3	72.7	63.9	59.0	52.2	51.3	50.2	67.5	10.0	77.5
	23	69.6	80.9	46.9	80.6	80.3	78.0	75.7	63.2	56.3	49.3	48.2	47.1	69.6	10.0	79.6

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	68.4	79.9	52.3	79.4	78.7	75.6	73.3	65.5	61.0	54.6	53.4	52.6
	Max	74.9	87.4	60.2	87.0	86.1	83.0	79.7	71.2	68.1	62.6	61.5	60.5
Energy Average		71.5	Average:		82.1	81.3	78.7	76.0	69.0	64.7	58.7	57.5	56.4
Night	Min	59.3	71.3	42.1	70.9	70.1	67.6	65.1	55.1	48.9	43.4	42.9	42.2
	Max	71.8	86.2	56.5	85.8	85.0	82.8	81.2	69.4	64.4	58.2	57.2	56.6
Energy Average		68.6	Average:		79.7	78.8	75.9	73.4	64.0	57.8	51.2	50.3	49.5

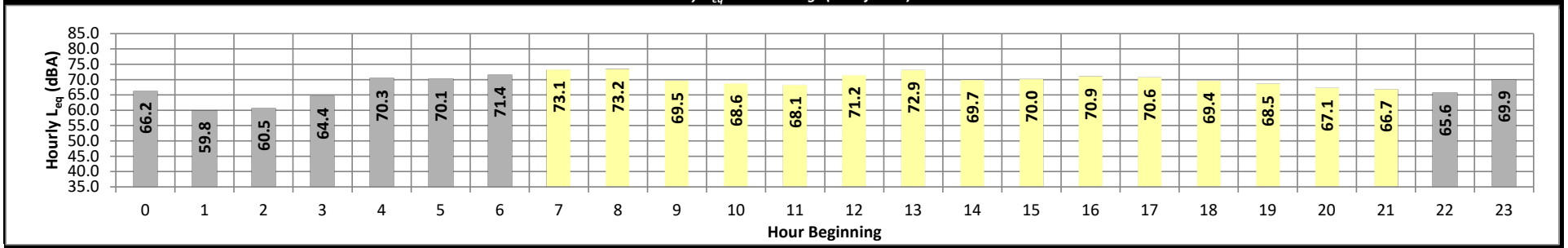
L_{eq} (dBA)		
24-Hour	Daytime (7am-10pm)	Nighttime (10pm-7am)
70.6	**71.5**	**68.6**

24-Hour Noise Level Measurement Summary

Date: Thursday, December 16, 2021 *Location:* L3 - Located east of the Project site near single-family *Meter:* Piccolo II *JN:* 14505

Project: Perris Residential *Source:* residence at 3176 Shrike Lane. *Analyst:* A. Khan

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	66.2	78.3	48.8	77.9	77.0	73.6	71.8	61.8	54.1	50.0	49.5	49.0	66.2	10.0	76.2
	1	59.8	71.8	46.8	71.5	70.9	68.0	65.4	55.1	50.7	47.9	47.5	47.1	59.8	10.0	69.8
	2	60.5	72.2	48.4	71.7	70.9	68.4	65.9	57.7	52.7	49.4	48.9	48.5	60.5	10.0	70.5
	3	64.4	75.8	50.8	75.4	74.6	72.2	70.3	61.9	56.2	51.7	51.3	50.9	64.4	10.0	74.4
	4	70.3	81.4	56.2	81.0	80.3	77.2	75.4	69.1	63.9	57.7	57.0	56.4	70.3	10.0	80.3
	5	70.1	80.7	56.6	80.3	79.5	77.2	75.5	69.5	63.6	57.8	57.3	56.7	70.1	10.0	80.1
	6	71.4	81.6	58.1	81.2	80.4	78.0	76.5	71.4	66.5	59.6	58.8	58.3	71.4	10.0	81.4
Day	7	73.1	83.2	59.0	82.8	81.9	79.4	77.8	73.4	68.7	60.8	60.0	59.1	73.1	0.0	73.1
	8	73.2	83.0	58.2	82.6	81.8	79.5	78.1	73.7	69.0	60.6	59.5	58.4	73.2	0.0	73.2
	9	69.5	79.7	54.5	79.3	78.5	76.4	74.9	69.5	63.8	56.7	55.7	54.7	69.5	0.0	69.5
	10	68.6	79.6	53.7	79.2	78.2	75.4	73.6	67.8	62.6	56.3	55.1	54.0	68.6	0.0	68.6
	11	68.1	78.3	52.6	77.8	77.1	75.0	73.4	68.1	62.6	55.1	53.9	52.8	68.1	0.0	68.1
	12	71.2	81.3	55.8	80.9	80.2	77.8	76.3	71.3	66.4	58.5	57.5	56.4	71.2	0.0	71.2
	13	72.9	85.1	56.2	84.4	83.7	79.8	77.0	71.5	66.8	59.0	57.4	56.3	72.9	0.0	72.9
	14	69.7	79.5	55.7	79.0	78.2	75.9	74.5	70.2	65.5	58.1	56.9	56.0	69.7	0.0	69.7
	15	70.0	78.9	56.5	78.5	77.8	76.2	75.1	70.8	66.4	58.9	57.6	56.7	70.0	0.0	70.0
	16	70.9	80.8	56.8	80.4	79.7	77.5	76.0	71.0	66.0	58.9	57.8	57.0	70.9	0.0	70.9
	17	70.6	79.5	56.2	79.1	78.4	77.1	76.1	70.9	66.1	58.3	57.1	56.3	70.6	0.0	70.6
	18	69.4	78.5	56.2	78.2	77.4	75.5	74.4	70.3	65.5	58.3	57.2	56.4	69.4	0.0	69.4
	19	68.5	78.8	53.3	78.3	77.5	75.2	73.7	68.8	63.5	55.7	54.5	53.6	68.5	5.0	73.5
	20	67.1	77.2	50.2	76.8	76.1	74.0	72.4	67.2	61.8	52.6	51.4	50.4	67.1	5.0	72.1
	21	66.7	77.6	50.3	77.2	76.4	73.7	71.9	66.0	61.0	52.6	51.4	50.5	66.7	5.0	71.7
Night	22	65.6	76.7	49.3	76.3	75.4	72.7	70.9	64.8	58.7	51.4	50.2	49.5	65.6	10.0	75.6
	23	69.9	80.4	46.4	79.6	78.9	77.2	76.0	69.5	57.7	48.2	47.3	46.5	69.9	10.0	79.9

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	66.7	77.2	50.2	76.8	76.1	73.7	71.9	66.0	61.0	52.6	51.4	50.4
	Max	73.2	85.1	59.0	84.4	83.7	79.8	78.1	73.7	69.0	60.8	60.0	59.1
Energy Average		70.4	Average:		79.6	78.9	76.6	75.0	70.0	65.1	57.4	56.2	55.2
Night	Min	59.8	71.8	46.4	71.5	70.9	68.0	65.4	55.1	50.7	47.9	47.3	46.5
	Max	71.4	81.6	58.1	81.2	80.4	78.0	76.5	71.4	66.5	59.6	58.8	58.3
Energy Average		68.0	Average:		77.2	76.5	73.8	72.0	64.5	58.2	52.6	52.0	51.4

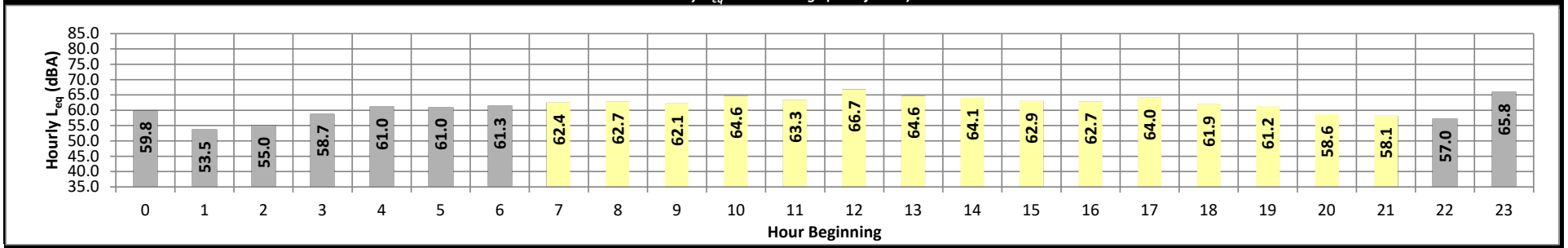
L_{eq} (dBA)		
24-Hour	*Daytime (7am-10pm)*	*Nighttime (10pm-7am)*
69.7	**70.4**	**68.0**

24-Hour Noise Level Measurement Summary

Date: Thursday, December 16, 2021 *Location:* L4 - Located southeast of the Project site near single-family *Meter:* Piccolo II *JN:* 14505

Project: Perris Residential *Source:* residence at 988 Parula Street. *Analyst:* A. Khan

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	59.8	70.5	47.7	69.9	69.0	66.8	65.2	58.8	53.5	48.7	48.3	47.9	59.8	10.0	69.8
	1	53.5	65.0	45.9	64.5	63.7	60.2	57.5	51.1	48.7	46.6	46.3	46.0	53.5	10.0	63.5
	2	55.0	65.7	47.4	64.9	63.7	61.4	59.6	54.1	51.1	48.2	47.9	47.5	55.0	10.0	65.0
	3	58.7	70.9	49.7	70.2	69.3	65.9	62.4	56.2	53.1	50.6	50.2	49.8	58.7	10.0	68.7
	4	61.0	70.7	53.5	70.1	69.4	66.9	65.3	60.9	57.2	54.3	53.9	53.6	61.0	10.0	71.0
	5	61.0	70.1	54.0	69.7	69.0	67.3	65.7	60.9	57.6	54.6	54.3	54.0	61.0	10.0	71.0
	6	61.3	70.0	55.4	69.6	68.9	66.8	65.3	61.5	58.6	56.0	55.8	55.5	61.3	10.0	71.3
Day	7	62.4	72.4	55.1	71.8	70.7	68.0	66.2	62.5	59.5	56.0	55.6	55.3	62.4	0.0	62.4
	8	62.7	73.6	53.7	72.9	71.9	69.4	66.7	62.0	58.9	54.8	54.3	53.9	62.7	0.0	62.7
	9	62.1	72.8	51.6	72.1	71.2	68.4	66.2	61.9	58.7	53.4	52.5	51.8	62.1	0.0	62.1
	10	64.6	72.5	53.1	71.7	71.0	69.3	68.4	65.6	63.0	57.1	55.6	53.7	64.6	0.0	64.6
	11	63.3	71.7	51.1	70.9	70.2	68.4	67.4	64.4	61.2	54.6	53.0	51.6	63.3	0.0	63.3
	12	66.7	77.6	51.8	76.9	75.9	73.8	71.6	66.1	62.4	54.5	53.2	52.1	66.7	0.0	66.7
	13	64.6	75.8	53.0	75.3	74.3	71.0	68.9	63.6	60.3	54.9	54.0	53.2	64.6	0.0	64.6
	14	64.1	74.4	53.7	73.8	73.0	70.6	68.3	63.8	60.5	55.8	54.9	53.9	64.1	0.0	64.1
	15	62.9	72.0	53.5	71.5	70.7	68.7	67.3	63.5	59.9	55.2	54.4	53.7	62.9	0.0	62.9
	16	62.7	72.7	53.0	72.2	71.5	69.0	67.0	62.5	59.0	54.5	53.8	53.1	62.7	0.0	62.7
	17	64.0	75.2	53.2	74.6	73.8	70.8	68.5	62.8	58.9	54.7	54.1	53.4	64.0	0.0	64.0
	18	61.9	71.3	52.9	70.7	69.9	67.7	66.5	62.2	58.6	54.2	53.7	53.1	61.9	0.0	61.9
	19	61.2	72.4	49.0	71.7	70.7	68.0	66.3	60.2	56.1	50.6	49.9	49.3	61.2	5.0	66.2
	20	58.6	68.5	46.2	68.0	67.3	65.5	64.0	58.3	53.8	48.1	47.2	46.4	58.6	5.0	63.6
	21	58.1	68.6	45.7	68.0	67.1	64.7	62.7	57.8	54.0	47.6	46.7	45.9	58.1	5.0	63.1
Night	22	57.0	68.2	44.7	67.5	66.5	63.6	61.8	56.4	51.7	45.9	45.4	44.9	57.0	10.0	67.0
	23	65.8	76.5	44.6	76.2	75.6	73.5	72.1	62.8	56.9	45.8	45.3	44.8	65.8	10.0	75.8

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	58.1	68.5	45.7	68.0	67.1	64.7	62.7	57.8	53.8	47.6	46.7	45.9
	Max	66.7	77.6	55.1	76.9	75.9	73.8	71.6	66.1	63.0	57.1	55.6	55.3
Energy Average		63.1	Average:		72.1	71.3	68.9	67.1	62.5	59.0	53.7	52.9	52.0
Night	Min	53.5	65.0	44.6	64.5	63.7	60.2	57.5	51.1	48.7	45.8	45.3	44.8
	Max	65.8	76.5	55.4	76.2	75.6	73.5	72.1	62.8	58.6	56.0	55.8	55.5
Energy Average		60.6	Average:		69.2	68.3	65.8	63.9	58.1	54.3	50.1	49.7	49.3

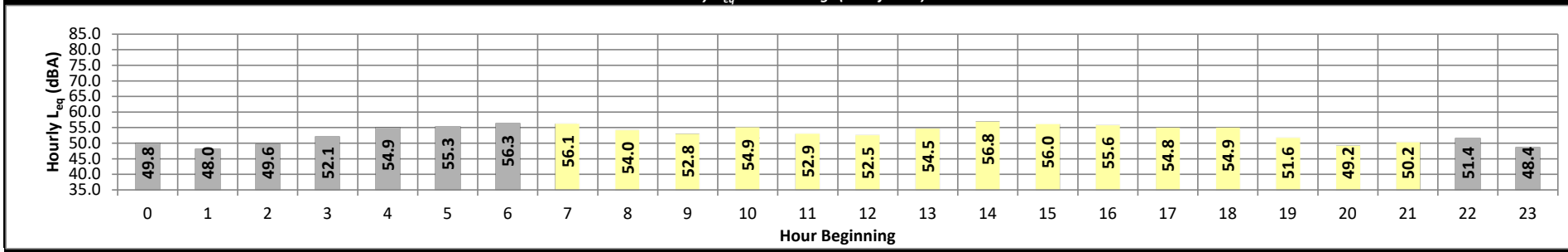
L_{eq} (dBA)		
24-Hour	Daytime (7am-10pm)	Nighttime (10pm-7am)
62.4	**63.1**	**60.6**

24-Hour Noise Level Measurement Summary

Date: Thursday, December 16, 2021 *Location:* L5 - Located southwest of the Project site near single-family *Meter:* Piccolo II *JN:* 14505

Project: Perris Residential *Source:* residence at 812 Parula Street. *Analyst:* A. Khan

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	49.8	62.3	46.1	62.0	61.8	60.5	58.1	53.2	49.4	46.8	46.5	46.2	49.8	10.0	59.8
	1	48.0	52.8	44.9	52.5	52.1	51.2	50.7	48.7	47.1	45.5	45.3	45.0	48.0	10.0	58.0
	2	49.6	55.0	45.8	54.7	54.4	53.4	52.7	50.1	48.6	46.3	46.1	45.9	49.6	10.0	59.6
	3	52.1	58.1	47.6	57.7	57.2	56.1	55.4	52.9	50.8	48.4	48.1	47.7	52.1	10.0	62.1
	4	54.9	58.4	52.5	58.1	57.9	57.3	56.9	55.5	54.5	53.1	52.8	52.6	54.9	10.0	64.9
	5	55.3	58.6	53.0	58.4	58.1	57.6	57.1	56.0	55.0	53.6	53.3	53.1	55.3	10.0	65.3
	6	56.3	60.0	54.1	59.7	59.3	58.5	58.2	56.8	55.9	54.6	54.4	54.2	56.3	10.0	66.3
Day	7	56.1	58.5	54.3	58.3	58.2	57.7	57.4	56.5	55.9	54.8	54.6	54.4	56.1	0.0	56.1
	8	54.0	57.8	52.2	57.5	57.2	56.6	56.0	54.4	53.5	52.6	52.5	52.3	54.0	0.0	54.0
	9	52.8	58.0	49.5	57.7	57.4	56.8	56.3	53.4	51.4	50.0	49.8	49.6	52.8	0.0	52.8
	10	54.9	61.4	47.1	61.1	60.7	59.9	59.5	56.5	51.9	48.3	47.8	47.3	54.9	0.0	54.9
	11	52.9	59.8	47.2	59.1	58.7	57.7	56.8	54.0	50.6	48.1	47.8	47.4	52.9	0.0	52.9
	12	52.5	73.1	47.8	72.5	72.0	69.7	68.6	62.5	56.6	49.0	48.5	48.0	52.5	0.0	52.5
	13	54.5	63.1	48.1	62.5	61.9	60.8	59.7	56.0	52.4	49.1	48.6	48.2	54.5	0.0	54.5
	14	56.8	64.3	50.2	63.9	63.2	62.1	61.3	57.5	54.4	51.2	50.8	50.3	56.8	0.0	56.8
	15	56.0	62.6	50.4	62.2	61.7	60.6	59.9	56.9	54.2	51.4	51.1	50.5	56.0	0.0	56.0
	16	55.6	61.4	50.1	61.0	60.6	59.8	59.4	56.9	54.0	51.0	50.6	50.2	55.6	0.0	55.6
	17	54.8	59.6	50.7	59.3	59.0	58.2	57.8	55.8	54.0	51.6	51.2	50.8	54.8	0.0	54.8
	18	54.9	60.6	50.1	60.3	60.0	59.1	58.4	55.9	53.5	51.0	50.7	50.3	54.9	0.0	54.9
	19	51.6	56.3	48.0	56.0	55.7	55.1	54.4	52.4	50.9	48.8	48.5	48.1	51.6	5.0	56.6
	20	49.2	55.7	43.8	55.4	55.2	54.3	53.2	49.7	47.2	44.9	44.4	44.0	49.2	5.0	54.2
	21	50.2	57.6	42.9	57.1	56.7	55.7	54.8	50.9	47.3	44.0	43.5	43.1	50.2	5.0	55.2
Night	22	51.4	63.6	42.3	62.8	61.8	58.5	55.8	48.8	45.8	43.1	42.8	42.4	51.4	10.0	61.4
	23	48.4	59.4	42.2	59.0	57.7	55.2	53.2	46.4	44.4	42.8	42.6	42.3	48.4	10.0	58.4

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	49.2	55.7	42.9	55.4	55.2	54.3	53.2	49.7	47.2	44.0	43.5	43.1
	Max	56.8	73.1	54.3	72.5	72.0	69.7	68.6	62.5	56.6	54.8	54.6	54.4
Energy Average		54.3	Average:		60.3	59.9	58.9	58.2	55.3	52.5	49.7	49.4	49.0
Night	Min	48.0	52.8	42.2	52.5	52.1	51.2	50.7	46.4	44.4	42.8	42.6	42.3
	Max	56.3	63.6	54.1	62.8	61.8	60.5	58.2	56.8	55.9	54.6	54.4	54.2
Energy Average		52.7	Average:		58.3	57.8	56.5	55.4	52.1	50.2	48.3	48.0	47.7

L_{eq} (dBA)		
24-Hour	*Daytime (7am-10pm)*	*Nighttime (10pm-7am)*
53.8	**54.3**	**52.7**

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APPENDIX 7.1:

ON-SITE TRAFFIC NOISE WORKSHEETS

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Backyard No Wall
Road Name: Rider Street
Lot No: 2D

Project Name: Perris Residential
Job Number: 14505
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,870	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	43	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	0.0	feet
Centerline Dist. to Observer:	114.0	feet
Barrier Distance to Observer:	114.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Barrier Elevation:	0.0	feet
Road Grade:	1.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	90.105
Medium Trucks:	116.407
Heavy Trucks:	122.116

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	2.63	-3.94	-1.20	*-42.05*	0.000	0.000
Medium Trucks:	77.62	-14.61	-5.61	-1.20	*42.26*	-19.045	-22.045
Heavy Trucks:	82.14	-18.57	-5.92	-1.20	*43.54*	-19.071	-22.071

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.8	64.9	63.2	57.1	65.7	66.3
Medium Trucks:	56.2	54.7	48.3	46.8	55.2	55.5
Heavy Trucks:	56.5	55.0	46.0	47.2	55.6	55.7
Vehicle Noise:	67.5	65.7	63.4	57.9	66.5	67.0

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.8	64.9	63.2	57.1	65.7	66.3
Medium Trucks:	37.2	35.7	29.3	27.7	36.2	36.4
Heavy Trucks:	37.4	36.0	26.9	28.2	36.5	36.7
Vehicle Noise:	66.8	64.9	63.2	57.1	65.7	66.3

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Backyard No Wall
Road Name: Rider Street
Lot No: 1A, 2A, 3A

Project Name: Perris Residential
Job Number: 14505
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,870	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	43	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	0.0	feet
Centerline Dist. to Observer:	80.0	feet
Barrier Distance to Observer:	80.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Barrier Elevation:	0.0	feet
Road Grade:	1.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	54.635
Medium Trucks:	82.453
Heavy Trucks:	88.162

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	2.63	-0.68	-1.20	*-42.02*	0.000	0.000
Medium Trucks:	77.62	-14.61	-3.36	-1.20	*42.28*	-19.046	-22.046
Heavy Trucks:	82.14	-18.57	-3.80	-1.20	*43.56*	-19.071	-22.071

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.1	68.2	66.4	60.4	69.0	69.6
Medium Trucks:	58.4	56.9	50.6	49.0	57.5	57.7
Heavy Trucks:	58.6	57.2	48.1	49.4	57.7	57.9
Vehicle Noise:	70.7	68.8	66.6	61.0	69.6	70.1

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.1	68.2	66.4	60.4	69.0	69.6
Medium Trucks:	39.4	37.9	31.5	30.0	38.5	38.7
Heavy Trucks:	39.5	38.1	29.0	30.3	38.7	38.8
Vehicle Noise:	70.1	68.2	66.4	60.4	69.0	69.6

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Backyard No Wall
Road Name: Evans Road
Lot No: 2B

Project Name: Perris Residential
Job Number: 14505
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,870	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	43	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	0.0	feet
Centerline Dist. to Observer:	92.0	feet
Barrier Distance to Observer:	92.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Barrier Elevation:	0.0	feet
Road Grade:	1.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	67.328
Medium Trucks:	94.433
Heavy Trucks:	100.142

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	2.63	-2.04	-1.20	*-42.03*	0.000	0.000
Medium Trucks:	77.62	-14.61	-4.25	-1.20	*42.27*	-19.045	-22.045
Heavy Trucks:	82.14	-18.57	-4.63	-1.20	*43.55*	-19.071	-22.071

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.7	66.8	65.1	59.0	67.6	68.2
Medium Trucks:	57.6	56.1	49.7	48.2	56.6	56.8
Heavy Trucks:	57.7	56.3	47.3	48.5	56.9	57.0
Vehicle Noise:	69.4	67.5	65.3	59.7	68.3	68.8

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.7	66.8	65.1	59.0	67.6	68.2
Medium Trucks:	38.5	37.0	30.7	29.1	37.6	37.8
Heavy Trucks:	38.7	37.3	28.2	29.5	37.8	37.9
Vehicle Noise:	68.7	66.8	65.1	59.0	67.6	68.2

Monday, October 10, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Backyard No Wall
Road Name: Evans Road
Lot No: 1A, 2A

Project Name: Perris Residential
Job Number: 14505
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,870 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	43 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	0.0 feet
Centerline Dist. to Observer:	95.0 feet
Barrier Distance to Observer:	95.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	70.463
Medium Trucks:	97.428
Heavy Trucks:	103.137

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	2.63	-2.34	-1.20	*-42.03*	0.000	0.000
Medium Trucks:	77.62	-14.61	-4.45	-1.20	*42.27*	-19.045	-22.045
Heavy Trucks:	82.14	-18.57	-4.82	-1.20	*43.55*	-19.071	-22.071

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.4	66.5	64.8	58.7	67.3	67.9
Medium Trucks:	57.4	55.9	49.5	47.9	56.4	56.6
Heavy Trucks:	57.6	56.1	47.1	48.3	56.7	56.8
Vehicle Noise:	69.1	67.2	65.0	59.4	68.0	68.6

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.4	66.5	64.8	58.7	67.3	67.9
Medium Trucks:	38.3	36.8	30.4	28.9	37.4	37.6
Heavy Trucks:	38.5	37.1	28.0	29.3	37.6	37.8
Vehicle Noise:	68.4	66.5	64.8	58.7	67.3	68.0

Monday, October 10, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Backyard No Wall
Road Name: Evans Road
Lot No: Pool Area

Project Name: Perris Residential
Job Number: 14505
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,870	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	43	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	0.0	feet
Centerline Dist. to Observer:	625.0	feet
Barrier Distance to Observer:	625.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Barrier Elevation:	0.0	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	603.138
Medium Trucks:	627.317
Heavy Trucks:	633.026

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	2.63	-16.33	-1.20	*-42.07*	0.000	0.000
Medium Trucks:	77.62	-14.61	-16.58	-1.20	*42.20*	-19.044	-22.044
Heavy Trucks:	82.14	-18.57	-16.64	-1.20	*43.49*	-19.070	-22.070

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	54.4	52.5	50.8	44.7	53.3	54.0
Medium Trucks:	45.2	43.7	37.4	35.8	44.3	44.5
Heavy Trucks:	45.7	44.3	35.3	36.5	44.9	45.0
Vehicle Noise:	55.4	53.6	51.1	45.8	54.4	54.9

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	54.4	52.5	50.8	44.7	53.3	54.0
Medium Trucks:	26.2	24.7	18.3	16.8	25.2	25.5
Heavy Trucks:	26.7	25.2	16.2	17.5	25.8	25.9
Vehicle Noise:	54.5	52.6	50.8	44.7	53.4	54.0

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Backyard No Wall
Road Name: Rider Street
Lot No: Pool Area

Project Name: Perris Residential
Job Number: 14505
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,870	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	43	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	0.0	feet
Centerline Dist. to Observer:	350.0	feet
Barrier Distance to Observer:	350.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Barrier Elevation:	0.0	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	327.834
Medium Trucks:	352.333
Heavy Trucks:	358.042

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	2.63	-12.35	-1.20	*-42.07*	0.000	0.000
Medium Trucks:	77.62	-14.61	-12.82	-1.20	*42.22*	-19.044	-22.044
Heavy Trucks:	82.14	-18.57	-12.93	-1.20	*43.50*	-19.070	-22.070

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	58.4	56.5	54.8	48.7	57.3	57.9
Medium Trucks:	49.0	47.5	41.1	39.6	48.0	48.3
Heavy Trucks:	49.4	48.0	39.0	40.2	48.6	48.7
Vehicle Noise:	59.4	57.5	55.0	49.7	58.3	58.8

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	58.4	56.5	54.8	48.7	57.3	57.9
Medium Trucks:	29.9	28.4	22.1	20.5	29.0	29.2
Heavy Trucks:	30.4	29.0	19.9	21.2	29.5	29.7
Vehicle Noise:	58.4	56.5	54.8	48.7	57.3	57.9

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: First Floor With Wall
Road Name: Rider Street
Lot No: 2D

Project Name: Perris Residential
Job Number: 14505
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,870	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	43	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	0.0	feet
Centerline Dist. to Observer:	114.0	feet
Barrier Distance to Observer:	114.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Barrier Elevation:	0.0	feet
Road Grade:	1.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	90.105
Medium Trucks:	116.407
Heavy Trucks:	122.116

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	2.63	-3.94	-1.20	*-42.05*	0.000	0.000
Medium Trucks:	77.62	-14.61	-5.61	-1.20	*42.26*	-19.045	-22.045
Heavy Trucks:	82.14	-18.57	-5.92	-1.20	*43.54*	-19.071	-22.071

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.8	64.9	63.2	57.1	65.7	66.3
Medium Trucks:	56.2	54.7	48.3	46.8	55.2	55.5
Heavy Trucks:	56.5	55.0	46.0	47.2	55.6	55.7
Vehicle Noise:	67.5	65.7	63.4	57.9	66.5	67.0

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.8	64.9	63.2	57.1	65.7	66.3
Medium Trucks:	37.2	35.7	29.3	27.7	36.2	36.4
Heavy Trucks:	37.4	36.0	26.9	28.2	36.5	36.7
Vehicle Noise:	66.8	64.9	63.2	57.1	65.7	66.3

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: First Floor With Wall
Road Name: Rider Street
Lot No: 1A, 2A, 3A

Project Name: Perris Residential
Job Number: 14505
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,870 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	43 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	0.0 feet
Centerline Dist. to Observer:	80.0 feet
Barrier Distance to Observer:	80.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	54.635
Medium Trucks:	82.453
Heavy Trucks:	88.162

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	2.63	-0.68	-1.20	*-42.02*	0.000	0.000
Medium Trucks:	77.62	-14.61	-3.36	-1.20	*42.28*	-19.046	-22.046
Heavy Trucks:	82.14	-18.57	-3.80	-1.20	*43.56*	-19.071	-22.071

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.1	68.2	66.4	60.4	69.0	69.6
Medium Trucks:	58.4	56.9	50.6	49.0	57.5	57.7
Heavy Trucks:	58.6	57.2	48.1	49.4	57.7	57.9
Vehicle Noise:	70.7	68.8	66.6	61.0	69.6	70.1

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.1	68.2	66.4	60.4	69.0	69.6
Medium Trucks:	39.4	37.9	31.5	30.0	38.5	38.7
Heavy Trucks:	39.5	38.1	29.0	30.3	38.7	38.8
Vehicle Noise:	70.1	68.2	66.4	60.4	69.0	69.6

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: First Floor With Wall
Road Name: Evans Road
Lot No: 2B

Project Name: Perris Residential
Job Number: 14505
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,870	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	43	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	0.0	feet
Centerline Dist. to Observer:	92.0	feet
Barrier Distance to Observer:	92.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Barrier Elevation:	0.0	feet
Road Grade:	1.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	67.328
Medium Trucks:	94.433
Heavy Trucks:	100.142

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	2.63	-2.04	-1.20	*-42.03*	0.000	0.000
Medium Trucks:	77.62	-14.61	-4.25	-1.20	*42.27*	-19.045	-22.045
Heavy Trucks:	82.14	-18.57	-4.63	-1.20	*43.55*	-19.071	-22.071

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.7	66.8	65.1	59.0	67.6	68.2
Medium Trucks:	57.6	56.1	49.7	48.2	56.6	56.8
Heavy Trucks:	57.7	56.3	47.3	48.5	56.9	57.0
Vehicle Noise:	69.4	67.5	65.3	59.7	68.3	68.8

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.7	66.8	65.1	59.0	67.6	68.2
Medium Trucks:	38.5	37.0	30.7	29.1	37.6	37.8
Heavy Trucks:	38.7	37.3	28.2	29.5	37.8	37.9
Vehicle Noise:	68.7	66.8	65.1	59.0	67.6	68.2

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: First Floor With Wall
Road Name: Evans Road
Lot No: 1A, 2A

Project Name: Perris Residential
Job Number: 14505
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,870	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	43	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	0.0	feet
Centerline Dist. to Observer:	95.0	feet
Barrier Distance to Observer:	95.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Barrier Elevation:	0.0	feet
Road Grade:	1.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	70.463
Medium Trucks:	97.428
Heavy Trucks:	103.137

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	2.63	-2.34	-1.20	*-42.03*	0.000	0.000
Medium Trucks:	77.62	-14.61	-4.45	-1.20	*42.27*	-19.045	-22.045
Heavy Trucks:	82.14	-18.57	-4.82	-1.20	*43.55*	-19.071	-22.071

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.4	66.5	64.8	58.7	67.3	67.9
Medium Trucks:	57.4	55.9	49.5	47.9	56.4	56.6
Heavy Trucks:	57.6	56.1	47.1	48.3	56.7	56.8
Vehicle Noise:	69.1	67.2	65.0	59.4	68.0	68.6

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.4	66.5	64.8	58.7	67.3	67.9
Medium Trucks:	38.3	36.8	30.4	28.9	37.4	37.6
Heavy Trucks:	38.5	37.1	28.0	29.3	37.6	37.8
Vehicle Noise:	68.4	66.5	64.8	58.7	67.3	68.0

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: First Floor With Wall
Road Name: Evans Road
Lot No: Pool Area

Project Name: Perris Residential
Job Number: 14505
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,870	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	43	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	0.0	feet
Centerline Dist. to Observer:	625.0	feet
Barrier Distance to Observer:	625.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Barrier Elevation:	0.0	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	603.138
Medium Trucks:	627.317
Heavy Trucks:	633.026

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	2.63	-16.33	-1.20	*-42.07*	0.000	0.000
Medium Trucks:	77.62	-14.61	-16.58	-1.20	*42.20*	-19.044	-22.044
Heavy Trucks:	82.14	-18.57	-16.64	-1.20	*43.49*	-19.070	-22.070

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	54.4	52.5	50.8	44.7	53.3	54.0
Medium Trucks:	45.2	43.7	37.4	35.8	44.3	44.5
Heavy Trucks:	45.7	44.3	35.3	36.5	44.9	45.0
Vehicle Noise:	55.4	53.6	51.1	45.8	54.4	54.9

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	54.4	52.5	50.8	44.7	53.3	54.0
Medium Trucks:	26.2	24.7	18.3	16.8	25.2	25.5
Heavy Trucks:	26.7	25.2	16.2	17.5	25.8	25.9
Vehicle Noise:	54.5	52.6	50.8	44.7	53.4	54.0

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: First Floor With Wall
Road Name: Rider Street
Lot No: Pool Area

Project Name: Perris Residential
Job Number: 14505
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,870	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	43	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	0.0	feet
Centerline Dist. to Observer:	350.0	feet
Barrier Distance to Observer:	350.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Barrier Elevation:	0.0	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	327.834
Medium Trucks:	352.333
Heavy Trucks:	358.042

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	2.63	-12.35	-1.20	*-42.07*	0.000	0.000
Medium Trucks:	77.62	-14.61	-12.82	-1.20	*42.22*	-19.044	-22.044
Heavy Trucks:	82.14	-18.57	-12.93	-1.20	*43.50*	-19.070	-22.070

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	58.4	56.5	54.8	48.7	57.3	57.9
Medium Trucks:	49.0	47.5	41.1	39.6	48.0	48.3
Heavy Trucks:	49.4	48.0	39.0	40.2	48.6	48.7
Vehicle Noise:	59.4	57.5	55.0	49.7	58.3	58.8

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	58.4	56.5	54.8	48.7	57.3	57.9
Medium Trucks:	29.9	28.4	22.1	20.5	29.0	29.2
Heavy Trucks:	30.4	29.0	19.9	21.2	29.5	29.7
Vehicle Noise:	58.4	56.5	54.8	48.7	57.3	57.9

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Second Floor With Wall
Road Name: Rider Street
Lot No: 2D

Project Name: Perris Residential
Job Number: 14505
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,870	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	43	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	0.0	feet
Centerline Dist. to Observer:	114.0	feet
Barrier Distance to Observer:	114.0	feet
Observer Height (Above Pad):	14.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Barrier Elevation:	0.0	feet
Road Grade:	1.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	91.049
Medium Trucks:	90.725
Heavy Trucks:	122.862

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	2.63	-4.01	-1.20	*-41.88*	0.000	0.000
Medium Trucks:	77.62	-14.61	-3.98	-1.20	*-42.31*	0.000	0.000
Heavy Trucks:	82.14	-18.57	-5.96	-1.20	*44.13*	-19.083	-22.083

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.8	64.9	63.1	57.0	65.7	66.3
Medium Trucks:	57.8	56.3	50.0	48.4	56.9	57.1
Heavy Trucks:	56.4	55.0	46.0	47.2	55.6	55.7
Vehicle Noise:	67.6	65.8	63.4	58.0	66.6	67.1

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.8	64.9	63.1	57.0	65.7	66.3
Medium Trucks:	57.8	56.3	50.0	48.4	56.9	57.1
Heavy Trucks:	37.3	35.9	26.9	28.1	36.5	36.6
Vehicle Noise:	67.3	65.4	63.3	57.6	66.2	66.8

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Second Floor With Wall
Road Name: Rider Street
Lot No: 1A, 2A, 3A

Project Name: Perris Residential
Job Number: 14505
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,870	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	43	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	0.0	feet
Centerline Dist. to Observer:	80.0	feet
Barrier Distance to Observer:	80.0	feet
Observer Height (Above Pad):	14.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Barrier Elevation:	0.0	feet
Road Grade:	1.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	56.178
Medium Trucks:	55.650
Heavy Trucks:	89.222

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	2.63	-0.86	-1.20	*-41.64*	0.000	0.000
Medium Trucks:	77.62	-14.61	-0.80	-1.20	*-42.25*	0.000	0.000
Heavy Trucks:	82.14	-18.57	-3.88	-1.20	*44.37*	-19.087	-22.087

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.9	68.0	66.2	60.2	68.8	69.4
Medium Trucks:	61.0	59.5	53.1	51.6	60.1	60.3
Heavy Trucks:	58.5	57.1	48.0	49.3	57.6	57.8
Vehicle Noise:	70.7	68.9	66.5	61.1	69.6	70.2

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.9	68.0	66.2	60.2	68.8	69.4
Medium Trucks:	61.0	59.5	53.1	51.6	60.1	60.3
Heavy Trucks:	39.4	38.0	29.0	30.2	38.6	38.7
Vehicle Noise:	70.4	68.6	66.5	60.8	69.4	69.9

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Second Floor With Wall
Road Name: Evans Road
Lot No: 2B

Project Name: Perris Residential
Job Number: 14505
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,870	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	43	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	0.0	feet
Centerline Dist. to Observer:	92.0	feet
Barrier Distance to Observer:	92.0	feet
Observer Height (Above Pad):	14.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Barrier Elevation:	0.0	feet
Road Grade:	1.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	68.586
Medium Trucks:	68.154
Heavy Trucks:	101.065

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	2.63	-2.16	-1.20	*-41.76*	0.000	0.000
Medium Trucks:	77.62	-14.61	-2.12	-1.20	*-42.28*	0.000	0.000
Heavy Trucks:	82.14	-18.57	-4.69	-1.20	*44.27*	-19.085	-22.085

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.6	66.7	64.9	58.9	67.5	68.1
Medium Trucks:	59.7	58.2	51.8	50.3	58.7	59.0
Heavy Trucks:	57.7	56.3	47.2	48.5	56.8	57.0
Vehicle Noise:	69.4	67.6	65.2	59.8	68.4	68.9

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.6	66.7	64.9	58.9	67.5	68.1
Medium Trucks:	59.7	58.2	51.8	50.3	58.7	59.0
Heavy Trucks:	38.6	37.2	28.1	29.4	37.7	37.9
Vehicle Noise:	69.1	67.3	65.2	59.5	68.1	68.6

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Second Floor With Wall
Road Name: Evans Road
Lot No: 1A, 2A

Project Name: Perris Residential
Job Number: 14505
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,870	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	43	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	0.0	feet
Centerline Dist. to Observer:	95.0	feet
Barrier Distance to Observer:	95.0	feet
Observer Height (Above Pad):	14.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Barrier Elevation:	0.0	feet
Road Grade:	1.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	71.666
Medium Trucks:	71.253
Heavy Trucks:	104.032

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	2.63	-2.45	-1.20	*-41.78*	0.000	0.000
Medium Trucks:	77.62	-14.61	-2.41	-1.20	*-42.29*	0.000	0.000
Heavy Trucks:	82.14	-18.57	-4.88	-1.20	*44.25*	-19.085	-22.085

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.3	66.4	64.7	58.6	67.2	67.8
Medium Trucks:	59.4	57.9	51.5	50.0	58.4	58.7
Heavy Trucks:	57.5	56.1	47.0	48.3	56.6	56.8
Vehicle Noise:	69.2	67.3	64.9	59.5	68.1	68.6

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.3	66.4	64.7	58.6	67.2	67.8
Medium Trucks:	59.4	57.9	51.5	50.0	58.4	58.7
Heavy Trucks:	38.4	37.0	28.0	29.2	37.6	37.7
Vehicle Noise:	68.9	67.0	64.9	59.2	67.8	68.3

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Second Floor With Wall
Road Name: Evans Road
Lot No: Pool Area

Project Name: Perris Residential
Job Number: 14505
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,870	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	43	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	0.0	feet
Centerline Dist. to Observer:	625.0	feet
Barrier Distance to Observer:	625.0	feet
Observer Height (Above Pad):	14.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Barrier Elevation:	0.0	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	603.279
Medium Trucks:	627.454
Heavy Trucks:	633.163

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	2.63	-16.33	-1.20	*-42.07*	0.000	0.000
Medium Trucks:	77.62	-14.61	-16.58	-1.20	*42.23*	-19.045	-22.045
Heavy Trucks:	82.14	-18.57	-16.64	-1.20	*43.61*	-19.072	-22.072

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	54.4	52.5	50.8	44.7	53.3	54.0
Medium Trucks:	45.2	43.7	37.4	35.8	44.3	44.5
Heavy Trucks:	45.7	44.3	35.3	36.5	44.9	45.0
Vehicle Noise:	55.4	53.6	51.1	45.8	54.4	54.9

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	54.4	52.5	50.8	44.7	53.3	54.0
Medium Trucks:	26.2	24.7	18.3	16.8	25.2	25.5
Heavy Trucks:	26.7	25.2	16.2	17.5	25.8	25.9
Vehicle Noise:	54.5	52.6	50.8	44.7	53.4	54.0

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Second Floor With Wall
Road Name: Rider Street
Lot No: Pool Area

Project Name: Perris Residential
Job Number: 14505
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,870	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	43	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	0.0	feet
Centerline Dist. to Observer:	350.0	feet
Barrier Distance to Observer:	350.0	feet
Observer Height (Above Pad):	14.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Barrier Elevation:	0.0	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	328.094
Medium Trucks:	352.577
Heavy Trucks:	358.286

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	2.63	-12.36	-1.20	*-42.05*	0.000	0.000
Medium Trucks:	77.62	-14.61	-12.83	-1.20	*42.26*	-19.045	-22.045
Heavy Trucks:	82.14	-18.57	-12.93	-1.20	*43.70*	-19.074	-22.074

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	58.4	56.5	54.7	48.7	57.3	57.9
Medium Trucks:	49.0	47.5	41.1	39.6	48.0	48.3
Heavy Trucks:	49.4	48.0	39.0	40.2	48.6	48.7
Vehicle Noise:	59.4	57.5	55.0	49.7	58.3	58.8

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	58.4	56.5	54.7	48.7	57.3	57.9
Medium Trucks:	29.9	28.4	22.1	20.5	29.0	29.2
Heavy Trucks:	30.4	28.9	19.9	21.2	29.5	29.6
Vehicle Noise:	58.4	56.5	54.8	48.7	57.3	57.9

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Third Floor With Wall
Road Name: Rider Street
Lot No: 2D

Project Name: Perris Residential
Job Number: 14505
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,870	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	43	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	0.0	feet
Centerline Dist. to Observer:	114.0	feet
Barrier Distance to Observer:	114.0	feet
Observer Height (Above Pad):	23.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Barrier Elevation:	0.0	feet
Road Grade:	1.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	92.860
Medium Trucks:	92.318
Heavy Trucks:	124.303

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	2.63	-4.14	-1.20	*-41.56*	0.000	0.000
Medium Trucks:	77.62	-14.61	-4.10	-1.20	*-42.20*	0.000	0.000
Heavy Trucks:	82.14	-18.57	-6.04	-1.20	*44.55*	-19.091	-22.091

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.6	64.7	63.0	56.9	65.5	66.1
Medium Trucks:	57.7	56.2	49.8	48.3	56.8	57.0
Heavy Trucks:	56.3	54.9	45.9	47.1	55.5	55.6
Vehicle Noise:	67.5	65.7	63.3	57.9	66.4	67.0

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.6	64.7	63.0	56.9	65.5	66.1
Medium Trucks:	57.7	56.2	49.8	48.3	56.8	57.0
Heavy Trucks:	37.2	35.8	26.8	28.0	36.4	36.5
Vehicle Noise:	67.2	65.3	63.2	57.5	66.1	66.6

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Third Floor With Wall
Road Name: Rider Street
Lot No: 1A, 2A, 3A

Project Name: Perris Residential
Job Number: 14505
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,870 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	43 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	0.0 feet
Centerline Dist. to Observer:	80.0 feet
Barrier Distance to Observer:	80.0 feet
Observer Height (Above Pad):	23.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	59.068
Medium Trucks:	58.212
Heavy Trucks:	91.247

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	2.63	-1.19	-1.20	*-40.98*	0.000	0.000
Medium Trucks:	77.62	-14.61	-1.09	-1.20	*-41.88*	0.000	0.000
Heavy Trucks:	82.14	-18.57	-4.02	-1.20	*44.80*	-19.096	-22.096

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.6	67.7	65.9	59.9	68.5	69.1
Medium Trucks:	60.7	59.2	52.8	51.3	59.8	60.0
Heavy Trucks:	58.4	56.9	47.9	49.1	57.5	57.6
Vehicle Noise:	70.4	68.6	66.2	60.7	69.3	69.9

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.6	67.7	65.9	59.9	68.5	69.1
Medium Trucks:	60.7	59.2	52.8	51.3	59.8	60.0
Heavy Trucks:	39.3	37.8	28.8	30.0	38.4	38.5
Vehicle Noise:	70.1	68.3	66.1	60.4	69.0	69.6

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Third Floor With Wall
Road Name: Evans Road
Lot No: 2B

Project Name: Perris Residential
Job Number: 14505
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,870	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	43	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	0.0	feet
Centerline Dist. to Observer:	92.0	feet
Barrier Distance to Observer:	92.0	feet
Observer Height (Above Pad):	23.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Barrier Elevation:	0.0	feet
Road Grade:	1.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	70.972
Medium Trucks:	70.261
Heavy Trucks:	102.837

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	2.63	-2.39	-1.20	*-41.26*	0.000	0.000
Medium Trucks:	77.62	-14.61	-2.32	-1.20	*-42.05*	0.000	0.000
Heavy Trucks:	82.14	-18.57	-4.80	-1.20	*44.71*	-19.094	-22.094

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.4	66.5	64.7	58.7	67.3	67.9
Medium Trucks:	59.5	58.0	51.6	50.1	58.5	58.8
Heavy Trucks:	57.6	56.2	47.1	48.4	56.7	56.8
Vehicle Noise:	69.2	67.4	65.0	59.6	68.2	68.7

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.4	66.5	64.7	58.7	67.3	67.9
Medium Trucks:	59.5	58.0	51.6	50.1	58.5	58.8
Heavy Trucks:	38.5	37.1	28.0	29.3	37.6	37.8
Vehicle Noise:	68.9	67.1	64.9	59.2	67.8	68.4

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Third Floor With Wall
Road Name: Evans Road
Lot No: 1A, 2A

Project Name: Perris Residential
Job Number: 14505
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,870 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	43 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	0.0 feet
Centerline Dist. to Observer:	95.0 feet
Barrier Distance to Observer:	95.0 feet
Observer Height (Above Pad):	23.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Barrier Elevation:	0.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	73.953
Medium Trucks:	73.271
Heavy Trucks:	105.751

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	2.63	-2.65	-1.20	*-41.32*	0.000	0.000
Medium Trucks:	77.62	-14.61	-2.59	-1.20	*-42.08*	0.000	0.000
Heavy Trucks:	82.14	-18.57	-4.98	-1.20	*44.69*	-19.094	-22.094

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.1	66.2	64.5	58.4	67.0	67.6
Medium Trucks:	59.2	57.7	51.3	49.8	58.3	58.5
Heavy Trucks:	57.4	56.0	46.9	48.2	56.5	56.7
Vehicle Noise:	69.0	67.1	64.7	59.3	67.9	68.4

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.1	66.2	64.5	58.4	67.0	67.6
Medium Trucks:	59.2	57.7	51.3	49.8	58.3	58.5
Heavy Trucks:	38.3	36.9	27.8	29.1	37.4	37.6
Vehicle Noise:	68.6	66.8	64.7	59.0	67.6	68.1

Monday, October 10, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Third Floor With Wall
Road Name: Evans Road
Lot No: Pool Area

Project Name: Perris Residential
Job Number: 14505
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,870	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	43	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	0.0	feet
Centerline Dist. to Observer:	625.0	feet
Barrier Distance to Observer:	625.0	feet
Observer Height (Above Pad):	23.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Barrier Elevation:	0.0	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	603.555
Medium Trucks:	627.720
Heavy Trucks:	633.429

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	2.63	-16.33	-1.20	*-42.06*	0.000	0.000
Medium Trucks:	77.62	-14.61	-16.59	-1.20	*42.26*	-19.045	-22.045
Heavy Trucks:	82.14	-18.57	-16.64	-1.20	*43.71*	-19.074	-22.074

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	54.4	52.5	50.8	44.7	53.3	54.0
Medium Trucks:	45.2	43.7	37.4	35.8	44.3	44.5
Heavy Trucks:	45.7	44.3	35.3	36.5	44.9	45.0
Vehicle Noise:	55.4	53.6	51.1	45.8	54.4	54.9

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	54.4	52.5	50.8	44.7	53.3	54.0
Medium Trucks:	26.2	24.7	18.3	16.8	25.2	25.5
Heavy Trucks:	26.7	25.2	16.2	17.4	25.8	25.9
Vehicle Noise:	54.5	52.6	50.8	44.7	53.4	54.0

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Third Floor With Wall
Road Name: Rider Street
Lot No: Pool Area

Project Name: Perris Residential
Job Number: 14505
Analyst: B. Maddux

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,700	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	2,870	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	43	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	0.0	feet
Centerline Dist. to Observer:	350.0	feet
Barrier Distance to Observer:	350.0	feet
Observer Height (Above Pad):	23.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Barrier Elevation:	0.0	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.00		
Medium Trucks:	2.30		
Heavy Trucks:	8.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	328.602
Medium Trucks:	353.052
Heavy Trucks:	358.761

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	2.63	-12.37	-1.20	*-42.02*	0.000	0.000
Medium Trucks:	77.62	-14.61	-12.84	-1.20	*42.29*	-19.046	-22.046
Heavy Trucks:	82.14	-18.57	-12.94	-1.20	*43.89*	-19.078	-22.078

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	58.4	56.5	54.7	48.7	57.3	57.9
Medium Trucks:	49.0	47.5	41.1	39.6	48.0	48.3
Heavy Trucks:	49.4	48.0	39.0	40.2	48.6	48.7
Vehicle Noise:	59.3	57.5	55.0	49.7	58.3	58.8

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	58.4	56.5	54.7	48.7	57.3	57.9
Medium Trucks:	29.9	28.4	22.1	20.5	29.0	29.2
Heavy Trucks:	30.4	28.9	19.9	21.1	29.5	29.6
Vehicle Noise:	58.4	56.5	54.7	48.7	57.3	57.9

APPENDIX 8.1:

OFF-SITE TRAFFIC NOISE WORKSHEETS

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: Rider St.
Road Segment: w/o Driveway 1

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,160 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	921 vehicles
Vehicle Speed:	45 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-2.31	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-19.55	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-23.50	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.3	64.2	62.4	56.4	65.0	65.6
Medium Trucks:	59.0	58.4	52.0	50.5	58.9	59.2
Heavy Trucks:	59.9	59.3	50.3	51.5	59.9	60.0
Vehicle Noise:	67.1	66.2	63.0	58.4	66.9	67.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	31	67	144	311
CNEL:	33	72	155	334

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: Rider St.
Road Segment: e/o Driveway 1

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,770 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	889 vehicles
Vehicle Speed:	45 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-2.46	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-19.70	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-23.66	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.1	64.0	62.3	56.2	64.8	65.5
Medium Trucks:	58.9	58.2	51.9	50.3	58.8	59.0
Heavy Trucks:	59.7	59.1	50.1	51.4	59.7	59.8
Vehicle Noise:	67.0	66.0	62.9	58.2	66.8	67.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	30	65	141	304
CNEL:	33	70	151	326

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: Rider St.
Road Segment: e/o Evans Rd.

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,770 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	559 vehicles
Vehicle Speed:	45 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-4.48	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-21.72	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-25.67	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	63.1	62.0	60.3	54.2	62.8	63.4
Medium Trucks:	56.9	56.2	49.8	48.3	56.8	57.0
Heavy Trucks:	57.7	57.1	48.1	49.3	57.7	57.8
Vehicle Noise:	64.9	64.0	60.9	56.2	64.7	65.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	22	48	104	223
CNEL:	24	52	111	239

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: Ramona Expressway
Road Segment: w/o Evans Rd.

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,100 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	2,318 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:	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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	56.409
Medium Trucks:	56.252
Heavy Trucks:	56.268

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	0.83	-0.89	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	82.40	-16.41	-0.87	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-20.37	-0.87	-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:	70.5	69.5	67.7	61.6	70.3	70.9
Medium Trucks:	63.9	63.3	56.9	55.3	63.8	64.0
Heavy Trucks:	64.0	63.4	54.3	55.6	63.9	64.1
Vehicle Noise:	72.1	71.2	68.2	63.3	71.9	72.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	79	170	367	790
CNEL:	85	183	394	850

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: Ramona Expressway
Road Segment: e/o Evans Rd.

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,370	vehicles
Peak Hour Percentage:	8.25%	
Peak Hour Volume:	1,598	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:	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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	56.409
Medium Trucks:	56.252
Heavy Trucks:	56.268

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-0.79	-0.89	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	82.40	-18.02	-0.87	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-21.98	-0.87	-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:	68.9	67.8	66.1	60.0	68.6	69.2
Medium Trucks:	62.3	61.6	55.3	53.7	62.2	62.4
Heavy Trucks:	62.3	61.8	52.7	54.0	62.3	62.5
Vehicle Noise:	70.5	69.6	66.6	61.7	70.3	70.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	62	133	286	616
CNEL:	66	143	308	663

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: Evans Rd.
Road Segment: n/o Ramona Expressway

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,560 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	1,614 vehicles
Vehicle Speed:	45 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.13	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-17.11	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-21.07	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.7	66.6	64.9	58.8	67.4	68.0
Medium Trucks:	61.5	60.8	54.4	52.9	61.4	61.6
Heavy Trucks:	62.3	61.7	52.7	53.9	62.3	62.4
Vehicle Noise:	69.5	68.6	65.5	60.8	69.3	69.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	45	97	210	452
CNEL:	49	105	225	485

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: Evans Rd.
Road Segment: s/o Ramona Expressway

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,670 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	1,128 vehicles
Vehicle Speed:	45 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	Day	Evening	Night	Daily
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	-1.43	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-18.67	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-22.62	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.1	65.1	63.3	57.3	65.9	66.5
Medium Trucks:	59.9	59.2	52.9	51.3	59.8	60.0
Heavy Trucks:	60.8	60.2	51.1	52.4	60.7	60.9
Vehicle Noise:	68.0	67.1	63.9	59.3	67.8	68.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	36	77	165	356
CNEL:	38	82	177	382

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E
Road Name: Evans Rd.
Road Segment: s/o Rider St.

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	9,990 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	824 vehicles
Vehicle Speed:	45 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-2.79	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-20.03	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-23.98	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.8	63.7	62.0	55.9	64.5	65.1
Medium Trucks:	58.6	57.9	51.5	50.0	58.4	58.7
Heavy Trucks:	59.4	58.8	49.8	51.0	59.4	59.5
Vehicle Noise:	66.6	65.7	62.6	57.9	66.4	66.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	29	62	134	289
CNEL:	31	67	144	310

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: Rider St.
Road Segment: w/o Driveway 1

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,480 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	947 vehicles
Vehicle Speed:	45 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-2.19	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-19.43	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-23.38	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.4	64.3	62.6	56.5	65.1	65.7
Medium Trucks:	59.2	58.5	52.1	50.6	59.0	59.3
Heavy Trucks:	60.0	59.4	50.4	51.6	60.0	60.1
Vehicle Noise:	67.2	66.3	63.2	58.5	67.0	67.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	32	68	147	317
CNEL:	34	73	158	340

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: Rider St.
Road Segment: e/o Driveway 1

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,020 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	992 vehicles
Vehicle Speed:	45 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-1.99	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-19.23	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-23.18	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.6	64.5	62.8	56.7	65.3	65.9
Medium Trucks:	59.4	58.7	52.3	50.8	59.2	59.5
Heavy Trucks:	60.2	59.6	50.6	51.8	60.2	60.3
Vehicle Noise:	67.4	66.5	63.4	58.7	67.2	67.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	33	70	152	327
CNEL:	35	76	163	351

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: Rider St.
Road Segment: e/o Evans Rd.

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,010 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	578 vehicles
Vehicle Speed:	45 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-4.33	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-21.57	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-25.52	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	63.2	62.2	60.4	54.4	63.0	63.6
Medium Trucks:	57.0	56.3	50.0	48.4	56.9	57.1
Heavy Trucks:	57.9	57.3	48.2	49.5	57.8	58.0
Vehicle Noise:	65.1	64.2	61.0	56.4	64.9	65.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	23	49	106	228
CNEL:	24	53	114	245

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: Ramona Expressway
Road Segment: w/o Evans Rd.

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,500 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	2,351 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:	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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	56.409
Medium Trucks:	56.252
Heavy Trucks:	56.268

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	0.89	-0.89	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	82.40	-16.35	-0.87	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-20.30	-0.87	-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:	70.6	69.5	67.8	61.7	70.3	70.9
Medium Trucks:	64.0	63.3	57.0	55.4	63.9	64.1
Heavy Trucks:	64.0	63.4	54.4	55.6	64.0	64.1
Vehicle Noise:	72.2	71.2	68.3	63.4	72.0	72.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	80	172	370	797
CNEL:	86	185	398	858

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: Ramona Expressway
Road Segment: e/o Evans Rd.

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,450 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	1,605 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:	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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	56.409
Medium Trucks:	56.252
Heavy Trucks:	56.268

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-0.77	-0.89	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	82.40	-18.01	-0.87	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-21.96	-0.87	-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:	68.9	67.9	66.1	60.0	68.7	69.3
Medium Trucks:	62.3	61.7	55.3	53.7	62.2	62.4
Heavy Trucks:	62.4	61.8	52.7	54.0	62.3	62.5
Vehicle Noise:	70.5	69.6	66.6	61.8	70.3	70.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	62	133	287	618
CNEL:	67	143	309	665

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: Evans Rd.
Road Segment: n/o Ramona Expressway

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,720 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	1,627 vehicles
Vehicle Speed:	45 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.16	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-17.08	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-21.03	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.7	66.7	64.9	58.9	67.5	68.1
Medium Trucks:	61.5	60.8	54.5	52.9	61.4	61.6
Heavy Trucks:	62.4	61.8	52.7	54.0	62.3	62.5
Vehicle Noise:	69.6	68.7	65.5	60.8	69.4	69.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	45	98	211	455
CNEL:	49	105	227	488

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: Evans Rd.
Road Segment: s/o Ramona Expressway

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,310 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	1,181 vehicles
Vehicle Speed:	45 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-1.23	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-18.47	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-22.42	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.3	65.3	63.5	57.5	66.1	66.7
Medium Trucks:	60.1	59.4	53.1	51.5	60.0	60.2
Heavy Trucks:	61.0	60.4	51.3	52.6	60.9	61.1
Vehicle Noise:	68.2	67.3	64.1	59.5	68.0	68.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	37	79	171	367
CNEL:	39	85	183	394

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: E + P
Road Name: Evans Rd.
Road Segment: s/o Rider St.

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,390 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	857 vehicles
Vehicle Speed:	45 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-2.62	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-19.86	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-23.81	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.0	63.9	62.1	56.1	64.7	65.3
Medium Trucks:	58.7	58.1	51.7	50.1	58.6	58.8
Heavy Trucks:	59.6	59.0	50.0	51.2	59.6	59.7
Vehicle Noise:	66.8	65.9	62.7	58.1	66.6	67.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	30	64	138	297
CNEL:	32	69	148	318

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY NP
Road Name: Rider St.
Road Segment: w/o Driveway 1

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,630 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	1,042 vehicles
Vehicle Speed:	45 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-1.77	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-19.01	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-22.97	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.8	64.7	63.0	56.9	65.5	66.1
Medium Trucks:	59.6	58.9	52.5	51.0	59.5	59.7
Heavy Trucks:	60.4	59.8	50.8	52.0	60.4	60.5
Vehicle Noise:	67.6	66.7	63.6	58.9	67.5	67.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	34	73	157	338
CNEL:	36	78	168	363

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY NP
Road Name: Rider St.
Road Segment: e/o Driveway 1

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,220 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	1,008 vehicles
Vehicle Speed:	45 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-1.92	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-19.15	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-23.11	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.7	64.6	62.8	56.8	65.4	66.0
Medium Trucks:	59.4	58.8	52.4	50.9	59.3	59.5
Heavy Trucks:	60.3	59.7	50.7	51.9	60.3	60.4
Vehicle Noise:	67.5	66.6	63.4	58.8	67.3	67.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	33	71	153	331
CNEL:	35	76	165	355

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY NP
Road Name: Rider St.
Road Segment: e/o Evans Rd.

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,400 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	611 vehicles
Vehicle Speed:	45 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-4.09	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-21.33	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-25.29	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	63.5	62.4	60.6	54.6	63.2	63.8
Medium Trucks:	57.3	56.6	50.2	48.7	57.1	57.4
Heavy Trucks:	58.1	57.5	48.5	49.7	58.1	58.2
Vehicle Noise:	65.3	64.4	61.3	56.6	65.1	65.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	24	51	110	237
CNEL:	25	55	118	254

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY NP
Road Name: Ramona Expressway
Road Segment: w/o Evans Rd.

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	32,160 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	2,653 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:	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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	56.409
Medium Trucks:	56.252
Heavy Trucks:	56.268

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	1.42	-0.89	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	82.40	-15.82	-0.87	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-19.78	-0.87	-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:	71.1	70.0	68.3	62.2	70.8	71.5
Medium Trucks:	64.5	63.8	57.5	55.9	64.4	64.6
Heavy Trucks:	64.5	64.0	54.9	56.2	64.5	64.7
Vehicle Noise:	72.7	71.8	68.8	63.9	72.5	73.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	86	186	401	864
CNEL:	93	200	432	930

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY NP
Road Name: Ramona Expressway
Road Segment: e/o Evans Rd.

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	22,730	vehicles
Peak Hour Percentage:	8.25%	
Peak Hour Volume:	1,875	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:	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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	56.409
Medium Trucks:	56.252
Heavy Trucks:	56.268

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-0.09	-0.89	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	82.40	-17.33	-0.87	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-21.29	-0.87	-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:	69.6	68.5	66.8	60.7	69.3	69.9
Medium Trucks:	63.0	62.3	56.0	54.4	62.9	63.1
Heavy Trucks:	63.0	62.5	53.4	54.7	63.0	63.1
Vehicle Noise:	71.2	70.3	67.3	62.4	71.0	71.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	69	148	318	686
CNEL:	74	159	342	738

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY NP
Road Name: Evans Rd.
Road Segment: n/o Ramona Expressway

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,600	vehicles
Peak Hour Percentage:	8.25%	
Peak Hour Volume:	1,782	vehicles
Vehicle Speed:	45	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:	50.0	feet
Centerline Dist. to Observer:	50.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.56	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-16.68	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-20.64	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.1	67.1	65.3	59.2	67.9	68.5
Medium Trucks:	61.9	61.2	54.9	53.3	61.8	62.0
Heavy Trucks:	62.8	62.2	53.1	54.4	62.7	62.9
Vehicle Noise:	70.0	69.1	65.9	61.2	69.8	70.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	48	104	224	483
CNEL:	52	112	241	519

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY NP
Road Name: Evans Rd.
Road Segment: s/o Ramona Expressway

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,130	vehicles
Peak Hour Percentage:	8.25%	
Peak Hour Volume:	1,248	vehicles
Vehicle Speed:	45	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:	50.0	feet
Centerline Dist. to Observer:	50.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.99	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-18.23	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-22.18	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.6	65.5	63.8	57.7	66.3	66.9
Medium Trucks:	60.4	59.7	53.3	51.8	60.2	60.5
Heavy Trucks:	61.2	60.6	51.6	52.8	61.2	61.3
Vehicle Noise:	68.4	67.5	64.4	59.7	68.2	68.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	38	82	177	381
CNEL:	41	88	190	409

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY NP
Road Name: Evans Rd.
Road Segment: s/o Rider St.

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,020	vehicles
Peak Hour Percentage:	8.25%	
Peak Hour Volume:	909	vehicles
Vehicle Speed:	45	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:	50.0	feet
Centerline Dist. to Observer:	50.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-2.36	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-19.60	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-23.56	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.2	64.1	62.4	56.3	64.9	65.6
Medium Trucks:	59.0	58.3	52.0	50.4	58.9	59.1
Heavy Trucks:	59.8	59.2	50.2	51.5	59.8	59.9
Vehicle Noise:	67.0	66.1	63.0	58.3	66.9	67.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	31	67	143	309
CNEL:	33	71	154	331

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY WP
Road Name: Rider St.
Road Segment: w/o Driveway 1

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,950 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	1,068 vehicles
Vehicle Speed:	45 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-1.66	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-18.90	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-22.86	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.9	64.8	63.1	57.0	65.6	66.3
Medium Trucks:	59.7	59.0	52.7	51.1	59.6	59.8
Heavy Trucks:	60.5	59.9	50.9	52.2	60.5	60.6
Vehicle Noise:	67.8	66.8	63.7	59.0	67.6	68.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	34	74	160	344
CNEL:	37	79	171	369

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY WP
Road Name: Rider St.
Road Segment: e/o Driveway 1

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,470 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	1,111 vehicles
Vehicle Speed:	45 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-1.49	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-18.73	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-22.69	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.1	65.0	63.2	57.2	65.8	66.4
Medium Trucks:	59.9	59.2	52.8	51.3	59.7	60.0
Heavy Trucks:	60.7	60.1	51.1	52.3	60.7	60.8
Vehicle Noise:	67.9	67.0	63.9	59.2	67.7	68.2

Centerline Distance to Noise Contour (in feet)

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

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY WP
Road Name: Rider St.
Road Segment: e/o Evans Rd.

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,640 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	630 vehicles
Vehicle Speed:	45 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-3.96	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-21.19	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-25.15	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	63.6	62.6	60.8	54.7	63.4	64.0
Medium Trucks:	57.4	56.7	50.4	48.8	57.3	57.5
Heavy Trucks:	58.2	57.7	48.6	49.9	58.2	58.3
Vehicle Noise:	65.5	64.6	61.4	56.7	65.3	65.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	24	52	112	242
CNEL:	26	56	120	259

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY WP
Road Name: Ramona Expressway
Road Segment: w/o Evans Rd.

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	32,560	vehicles
Peak Hour Percentage:	8.25%	
Peak Hour Volume:	2,686	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:	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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	56.409
Medium Trucks:	56.252
Heavy Trucks:	56.268

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	1.47	-0.89	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	82.40	-15.77	-0.87	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-19.73	-0.87	-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:	71.2	70.1	68.3	62.3	70.9	71.5
Medium Trucks:	64.6	63.9	57.5	56.0	64.4	64.7
Heavy Trucks:	64.6	64.0	55.0	56.2	64.6	64.7
Vehicle Noise:	72.7	71.8	68.9	64.0	72.5	73.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	87	188	405	872
CNEL:	94	202	435	938

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY WP
Road Name: Ramona Expressway
Road Segment: e/o Evans Rd.

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	22,810	vehicles
Peak Hour Percentage:	8.25%	
Peak Hour Volume:	1,882	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:	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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	56.409
Medium Trucks:	56.252
Heavy Trucks:	56.268

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	-0.08	-0.89	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	82.40	-17.32	-0.87	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-21.27	-0.87	-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:	69.6	68.6	66.8	60.7	69.4	70.0
Medium Trucks:	63.0	62.3	56.0	54.4	62.9	63.1
Heavy Trucks:	63.1	62.5	53.4	54.7	63.0	63.2
Vehicle Noise:	71.2	70.3	67.3	62.4	71.0	71.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	69	148	319	687
CNEL:	74	159	343	740

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY WP
Road Name: Evans Rd.
Road Segment: n/o Ramona Expressway

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,760	vehicles
Peak Hour Percentage:	8.25%	
Peak Hour Volume:	1,795	vehicles
Vehicle Speed:	45	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:	50.0	feet
Centerline Dist. to Observer:	50.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.59	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-16.65	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-20.60	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.2	67.1	65.3	59.3	67.9	68.5
Medium Trucks:	61.9	61.3	54.9	53.4	61.8	62.1
Heavy Trucks:	62.8	62.2	53.2	54.4	62.8	62.9
Vehicle Noise:	70.0	69.1	65.9	61.3	69.8	70.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	49	105	225	486
CNEL:	52	112	242	521

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY WP
Road Name: Evans Rd.
Road Segment: s/o Ramona Expressway

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,770 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	1,301 vehicles
Vehicle Speed:	45 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-0.81	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-18.05	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-22.00	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.8	65.7	63.9	57.9	66.5	67.1
Medium Trucks:	60.5	59.9	53.5	52.0	60.4	60.7
Heavy Trucks:	61.4	60.8	51.8	53.0	61.4	61.5
Vehicle Noise:	68.6	67.7	64.5	59.9	68.4	68.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	39	84	182	392
CNEL:	42	91	195	420

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: OY WP
Road Name: Evans Rd.
Road Segment: s/o Rider St.

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,420 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	942 vehicles
Vehicle Speed:	45 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-2.21	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-19.45	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-23.40	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.4	64.3	62.5	56.5	65.1	65.7
Medium Trucks:	59.1	58.5	52.1	50.6	59.0	59.3
Heavy Trucks:	60.0	59.4	50.4	51.6	60.0	60.1
Vehicle Noise:	67.2	66.3	63.1	58.5	67.0	67.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	32	68	147	316
CNEL:	34	73	157	339

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY(2040) NP
Road Name: Rider St.
Road Segment: w/o Driveway 1

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,520 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	1,115 vehicles
Vehicle Speed:	45 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-1.48	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-18.72	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-22.67	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.1	65.0	63.3	57.2	65.8	66.4
Medium Trucks:	59.9	59.2	52.8	51.3	59.8	60.0
Heavy Trucks:	60.7	60.1	51.1	52.3	60.7	60.8
Vehicle Noise:	67.9	67.0	63.9	59.2	67.7	68.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	35	76	164	354
CNEL:	38	82	176	379

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY(2040) NP
Road Name: Rider St.
Road Segment: e/o Driveway 1

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,090 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	1,080 vehicles
Vehicle Speed:	45 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-1.62	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-18.86	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-22.81	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.0	64.9	63.1	57.1	65.7	66.3
Medium Trucks:	59.7	59.1	52.7	51.2	59.6	59.8
Heavy Trucks:	60.6	60.0	51.0	52.2	60.6	60.7
Vehicle Noise:	67.8	66.9	63.7	59.1	67.6	68.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	35	75	161	346
CNEL:	37	80	172	371

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY(2040) NP
Road Name: Rider St.
Road Segment: e/o Evans Rd.

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,880 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	650 vehicles
Vehicle Speed:	45 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-3.82	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-21.06	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-25.02	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	63.8	62.7	60.9	54.9	63.5	64.1
Medium Trucks:	57.5	56.9	50.5	48.9	57.4	57.6
Heavy Trucks:	58.4	57.8	48.8	50.0	58.4	58.5
Vehicle Noise:	65.6	64.7	61.5	56.9	65.4	65.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	25	53	115	247
CNEL:	26	57	123	265

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY(2040) NP
Road Name: Ramona Expressway
Road Segment: w/o Evans Rd.

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	37,420 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	3,087 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:	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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	56.409
Medium Trucks:	56.252
Heavy Trucks:	56.268

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	2.07	-0.89	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	82.40	-15.17	-0.87	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-19.12	-0.87	-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:	71.8	70.7	68.9	62.9	71.5	72.1
Medium Trucks:	65.2	64.5	58.1	56.6	65.0	65.3
Heavy Trucks:	65.2	64.6	55.6	56.8	65.2	65.3
Vehicle Noise:	73.3	72.4	69.5	64.6	73.1	73.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	96	206	444	956
CNEL:	103	222	477	1,029

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY(2040) NP
Road Name: Ramona Expressway
Road Segment: e/o Evans Rd.

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,740 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	2,371 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:	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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	56.409
Medium Trucks:	56.252
Heavy Trucks:	56.268

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	0.93	-0.89	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	82.40	-16.31	-0.87	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-20.27	-0.87	-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:	70.6	69.6	67.8	61.7	70.4	71.0
Medium Trucks:	64.0	63.3	57.0	55.4	63.9	64.1
Heavy Trucks:	64.1	63.5	54.4	55.7	64.0	64.2
Vehicle Noise:	72.2	71.3	68.3	63.4	72.0	72.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	80	173	372	802
CNEL:	86	186	400	863

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY(2040) NP
Road Name: Evans Rd.
Road Segment: n/o Ramona Expressway

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,930 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	2,469 vehicles
Vehicle Speed:	45 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.97	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-15.26	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-19.22	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.5	68.5	66.7	60.7	69.3	69.9
Medium Trucks:	63.3	62.7	56.3	54.7	63.2	63.4
Heavy Trucks:	64.2	63.6	54.5	55.8	64.2	64.3
Vehicle Noise:	71.4	70.5	67.3	62.7	71.2	71.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	60	129	279	601
CNEL:	64	139	299	645

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY(2040) NP
Road Name: Evans Rd.
Road Segment: s/o Ramona Expressway

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	24,170 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	1,994 vehicles
Vehicle Speed:	45 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.05	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-16.19	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-20.15	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.6	67.6	65.8	59.7	68.4	69.0
Medium Trucks:	62.4	61.7	55.4	53.8	62.3	62.5
Heavy Trucks:	63.2	62.7	53.6	54.9	63.2	63.3
Vehicle Noise:	70.5	69.6	66.4	61.7	70.3	70.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	52	112	242	521
CNEL:	56	120	259	559

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY(2040) NP
Road Name: Evans Rd.
Road Segment: s/o Rider St.

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,190 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	1,748 vehicles
Vehicle Speed:	45 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.47	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-16.76	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-20.72	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.0	67.0	65.2	59.2	67.8	68.4
Medium Trucks:	61.8	61.2	54.8	53.2	61.7	61.9
Heavy Trucks:	62.7	62.1	53.0	54.3	62.7	62.8
Vehicle Noise:	69.9	69.0	65.8	61.2	69.7	70.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	48	103	222	477
CNEL:	51	110	238	512

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY(2040) WP
Road Name: Rider St.
Road Segment: w/o Driveway 1

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,840 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	1,142 vehicles
Vehicle Speed:	45 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-1.38	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-18.61	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-22.57	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.2	65.1	63.4	57.3	65.9	66.5
Medium Trucks:	60.0	59.3	52.9	51.4	59.9	60.1
Heavy Trucks:	60.8	60.2	51.2	52.4	60.8	60.9
Vehicle Noise:	68.0	67.1	64.0	59.3	67.8	68.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	36	77	167	359
CNEL:	39	83	179	385

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY(2040) WP
Road Name: Rider St.
Road Segment: e/o Driveway 1

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,340	vehicles
Peak Hour Percentage:	8.25%	
Peak Hour Volume:	1,183	vehicles
Vehicle Speed:	45	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:	50.0	feet
Centerline Dist. to Observer:	50.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Road Grade:	0.0%	
Left View:	-90.0	degrees
Right View:	90.0	degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-1.22	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-18.46	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-22.42	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	66.4	65.3	63.5	57.5	66.1	66.7
Medium Trucks:	60.1	59.5	53.1	51.5	60.0	60.2
Heavy Trucks:	61.0	60.4	51.4	52.6	61.0	61.1
Vehicle Noise:	68.2	67.3	64.1	59.5	68.0	68.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	37	79	171	368
CNEL:	39	85	183	395

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY(2040) WP
Road Name: Rider St.
Road Segment: e/o Evans Rd.

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,120 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	670 vehicles
Vehicle Speed:	45 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	-3.69	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-20.93	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-24.89	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	63.9	62.8	61.1	55.0	63.6	64.2
Medium Trucks:	57.7	57.0	50.6	49.1	57.5	57.8
Heavy Trucks:	58.5	57.9	48.9	50.1	58.5	58.6
Vehicle Noise:	65.7	64.8	61.7	57.0	65.5	66.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	25	54	117	252
CNEL:	27	58	125	270

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY(2040) WP
Road Name: Ramona Expressway
Road Segment: w/o Evans Rd.

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	37,820 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	3,120 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:	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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	56.409
Medium Trucks:	56.252
Heavy Trucks:	56.268

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	2.12	-0.89	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	82.40	-15.12	-0.87	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-19.07	-0.87	-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:	71.8	70.7	69.0	62.9	71.5	72.2
Medium Trucks:	65.2	64.5	58.2	56.6	65.1	65.3
Heavy Trucks:	65.2	64.7	55.6	56.9	65.2	65.4
Vehicle Noise:	73.4	72.5	69.5	64.6	73.2	73.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	96	207	447	963
CNEL:	104	223	481	1,036

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY(2040) WP
Road Name: Ramona Expressway
Road Segment: e/o Evans Rd.

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	28,820 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	2,378 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:	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:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	56.409
Medium Trucks:	56.252
Heavy Trucks:	56.268

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	71.78	0.94	-0.89	-1.20	*-4.69*	0.000	0.000
Medium Trucks:	82.40	-16.30	-0.87	-1.20	*-4.88*	0.000	0.000
Heavy Trucks:	86.40	-20.26	-0.87	-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:	70.6	69.6	67.8	61.7	70.4	71.0
Medium Trucks:	64.0	63.4	57.0	55.5	63.9	64.1
Heavy Trucks:	64.1	63.5	54.4	55.7	64.1	64.2
Vehicle Noise:	72.2	71.3	68.3	63.5	72.0	72.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	80	173	373	803
CNEL:	86	186	401	864

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY(2040) WP
Road Name: Evans Rd.
Road Segment: n/o Ramona Expressway

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,090 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	2,482 vehicles
Vehicle Speed:	45 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	2.00	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-15.24	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-19.20	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.6	68.5	66.7	60.7	69.3	69.9
Medium Trucks:	63.3	62.7	56.3	54.8	63.2	63.5
Heavy Trucks:	64.2	63.6	54.6	55.8	64.2	64.3
Vehicle Noise:	71.4	70.5	67.4	62.7	71.2	71.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	60	130	280	603
CNEL:	65	139	300	647

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY(2040) WP
Road Name: Evans Rd.
Road Segment: s/o Ramona Expressway

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	24,810 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	2,047 vehicles
Vehicle Speed:	45 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	1.16	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-16.08	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-20.03	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.7	67.7	65.9	59.8	68.5	69.1
Medium Trucks:	62.5	61.8	55.5	53.9	62.4	62.6
Heavy Trucks:	63.4	62.8	53.7	55.0	63.3	63.5
Vehicle Noise:	70.6	69.7	66.5	61.8	70.4	70.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	53	114	246	530
CNEL:	57	123	264	569

Tuesday, October 25, 2022

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

Scenario: HY(2040) WP
Road Name: Evans Rd.
Road Segment: s/o Rider St.

Project Name: Perris Residential
Job Number: 14505

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	21,590 vehicles
Peak Hour Percentage:	8.25%
Peak Hour Volume:	1,781 vehicles
Vehicle Speed:	45 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:	50.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

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

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	46.915
Medium Trucks:	46.726
Heavy Trucks:	46.744

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	68.46	0.56	0.31	-1.20	*-4.65*	0.000	0.000
Medium Trucks:	79.45	-16.68	0.34	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	84.25	-20.64	0.34	-1.20	*-5.43*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.1	67.1	65.3	59.2	67.9	68.5
Medium Trucks:	61.9	61.2	54.9	53.3	61.8	62.0
Heavy Trucks:	62.7	62.2	53.1	54.4	62.7	62.9
Vehicle Noise:	70.0	69.1	65.9	61.2	69.8	70.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	48	104	224	483
CNEL:	52	112	241	518

Tuesday, October 25, 2022

APPENDIX 10.1:

OPERATIONAL MODEL

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14505 - Perris Residential

CadnaA Noise Prediction Model: 14505-02_Operation.cna
Date: 25.10.22
Analyst: B. Maddux

Calculation Configuration

Configuration	
Parameter	**Value**
General	
Max. Error (dB)	**0.00**
Max. Search Radius (#(Unit,LEN))	**2000.01**
Min. Dist Src to Rcvr	**0.00**
Partition	
Raster Factor	**0.50**
Max. Length of Section (#(Unit,LEN))	**999.99**
Min. Length of Section (#(Unit,LEN))	**1.01**
Min. Length of Section (%)	**0.00**
Proj. Line Sources	**On**
Proj. Area Sources	**On**
Ref. Time	
Reference Time Day (min)	**960.00**
Reference Time Night (min)	**480.00**
Daytime Penalty (dB)	**0.00**
Recr. Time Penalty (dB)	**5.00**
Night-time Penalty (dB)	**10.00**
DTM	
Standard Height (m)	**0.00**
Model of Terrain	**Triangulation**
Reflection	
max. Order of Reflection	**2**
Search Radius Src	**100.00**
Search Radius Rcvr	**100.00**
Max. Distance Source - Rcvr	**1000.00 1000.00**
Min. Distance Rvcr - Reflector	**1.00 1.00**
Min. Distance Source - Reflector	**0.10**
Industrial (ISO 9613)	
Lateral Diffraction	**some Obj**
Obst. within Area Src do not shield	**On**
Screening	**Incl. Ground Att. over Barrier**
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	**3.0 20.0 0.0**
Temperature (#(Unit,TEMP))	**10**
rel. Humidity (%)	**70**
Ground Absorption G	**0.50**
Wind Speed for Dir. (#(Unit,SPEED))	**3.0**
Roads (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)
R1		R1	49.7	41.6	50.0	0.0	0.0	0.0		x	Total	5.00	a	6270566.06	2247119.46	5.00
R2		R2	51.7	42.9	51.7	0.0	0.0	0.0		x	Total	5.00	a	6271720.58	2247121.19	5.00
R3		R3	49.9	42.5	50.6	0.0	0.0	0.0		x	Total	5.00	a	6271948.01	2246751.40	5.00
R4		R4	53.8	50.1	57.0	0.0	0.0	0.0		x	Total	5.00	a	6271836.90	2246480.57	5.00
R5		R5	52.0	47.0	54.3	0.0	0.0	0.0		x	Total	5.00	a	6270559.12	2246494.46	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		Trash01	102.7	102.7	102.7	Lw	102.7		150.00	0.00	90.00	8.00	a	6270784.28	2246878.69	8.00
POINTSOURCE		Trash02	102.7	102.7	102.7	Lw	102.7		150.00	0.00	90.00	8.00	a	6271409.28	2246874.79	8.00
POINTSOURCE		Trash03	102.7	102.7	102.7	Lw	102.7		150.00	0.00	90.00	8.00	a	6271637.14	2246791.45	8.00
POINTSOURCE		Trash04	102.7	102.7	102.7	Lw	102.7		150.00	0.00	90.00	8.00	a	6271721.78	2246519.32	8.00
POINTSOURCE		Trash05	102.7	102.7	102.7	Lw	102.7		150.00	0.00	90.00	8.00	a	6271404.07	2246794.06	8.00
POINTSOURCE		Trash06	102.7	102.7	102.7	Lw	102.7		150.00	0.00	90.00	8.00	a	6271467.87	2246523.22	8.00
POINTSOURCE		Trash07	102.7	102.7	102.7	Lw	102.7		150.00	0.00	90.00	8.00	a	6271284.28	2246524.53	8.00
POINTSOURCE		Trash08	102.7	102.7	102.7	Lw	102.7		150.00	0.00	90.00	8.00	a	6270965.27	2246528.43	8.00
POINTSOURCE		Trash09	102.7	102.7	102.7	Lw	102.7		150.00	0.00	90.00	8.00	a	6270638.45	2246600.05	8.00
POINTSOURCE		Trash10	102.7	102.7	102.7	Lw	102.7		150.00	0.00	90.00	8.00	a	6270910.58	2246597.44	8.00
POINTSOURCE		Park01	88.4	88.4	88.4	Lw	88.4		900.00	0.00	540.00	5.00	a	6270711.36	2246528.43	5.00
POINTSOURCE		Park02	88.4	88.4	88.4	Lw	88.4		900.00	0.00	540.00	5.00	a	6270901.47	2246528.43	5.00
POINTSOURCE		Park03	88.4	88.4	88.4	Lw	88.4		900.00	0.00	540.00	5.00	a	6271141.05	2246525.83	5.00

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		Park04	88.4	88.4	88.4	Lw	88.4		900.00	0.00	540.00	5.00	a	6271570.74	2246521.92	5.00
POINTSOURCE		Park05	88.4	88.4	88.4	Lw	88.4		900.00	0.00	540.00	5.00	a	6271793.39	2246527.13	5.00
POINTSOURCE		AC001	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270577.47	2246911.03	3.00
POINTSOURCE		AC002	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270604.38	2246910.16	3.00
POINTSOURCE		AC003	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270577.47	2246875.44	3.00
POINTSOURCE		AC004	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270604.38	2246876.31	3.00
POINTSOURCE		AC005	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270576.60	2246847.66	3.00
POINTSOURCE		AC006	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270603.51	2246846.79	3.00
POINTSOURCE		AC007	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270573.99	2246783.42	3.00
POINTSOURCE		AC008	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270602.64	2246782.56	3.00
POINTSOURCE		AC009	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270573.99	2246746.97	3.00
POINTSOURCE		AC010	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270600.90	2246746.97	3.00
POINTSOURCE		AC011	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270572.26	2246709.64	3.00
POINTSOURCE		AC012	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270600.03	2246711.38	3.00
POINTSOURCE		AC013	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270571.39	2246680.13	3.00
POINTSOURCE		AC014	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270598.30	2246680.13	3.00
POINTSOURCE		AC015	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270734.58	2246685.33	3.00
POINTSOURCE		AC016	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270764.10	2246685.33	3.00
POINTSOURCE		AC017	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270736.32	2246720.92	3.00
POINTSOURCE		AC018	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270763.23	2246720.06	3.00
POINTSOURCE		AC019	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270734.58	2246759.12	3.00
POINTSOURCE		AC020	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270764.97	2246760.85	3.00
POINTSOURCE		AC021	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270738.92	2246788.63	3.00
POINTSOURCE		AC022	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270764.97	2246792.10	3.00
POINTSOURCE		AC023	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270860.45	2246789.50	3.00
POINTSOURCE		AC024	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270885.63	2246790.37	3.00
POINTSOURCE		AC025	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270856.11	2246751.31	3.00
POINTSOURCE		AC026	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270883.02	2246751.31	3.00
POINTSOURCE		AC027	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270856.11	2246719.19	3.00
POINTSOURCE		AC028	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270884.76	2246718.32	3.00
POINTSOURCE		AC029	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270853.51	2246686.20	3.00
POINTSOURCE		AC030	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270883.02	2246685.33	3.00
POINTSOURCE		AC031	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270730.24	2246948.35	3.00
POINTSOURCE		AC032	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270729.38	2246924.05	3.00
POINTSOURCE		AC033	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270760.63	2246954.43	3.00
POINTSOURCE		AC034	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270760.63	2246925.79	3.00
POINTSOURCE		AC035	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270813.58	2246950.09	3.00
POINTSOURCE		AC036	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270813.58	2246923.18	3.00
POINTSOURCE		AC037	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270845.69	2246950.09	3.00
POINTSOURCE		AC038	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270845.69	2246924.05	3.00
POINTSOURCE		AC039	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270875.21	2246950.09	3.00
POINTSOURCE		AC040	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270876.08	2246924.05	3.00
POINTSOURCE		AC041	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270936.84	2246947.49	3.00
POINTSOURCE		AC042	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270965.49	2246947.49	3.00
POINTSOURCE		AC043	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270936.84	2246922.31	3.00
POINTSOURCE		AC044	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6270968.96	2246925.79	3.00
POINTSOURCE		AC045	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271235.45	2246949.22	3.00
POINTSOURCE		AC046	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271237.19	2246921.44	3.00
POINTSOURCE		AC047	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271263.23	2246950.09	3.00
POINTSOURCE		AC048	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271265.83	2246923.18	3.00
POINTSOURCE		AC049	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271318.78	2246944.88	3.00
POINTSOURCE		AC050	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271317.92	2246921.44	3.00
POINTSOURCE		AC051	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271350.90	2246947.49	3.00
POINTSOURCE		AC052	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271349.17	2246923.18	3.00
POINTSOURCE		AC053	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271378.68	2246948.35	3.00
POINTSOURCE		AC054	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271377.81	2246921.44	3.00
POINTSOURCE		AC055	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271437.71	2246949.22	3.00
POINTSOURCE		AC056	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271470.69	2246946.62	3.00
POINTSOURCE		AC057	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271467.22	2246919.71	3.00
POINTSOURCE		AC058	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271435.97	2246919.71	3.00
POINTSOURCE		AC059	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271180.76	2246783.42	3.00
POINTSOURCE		AC060	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271179.90	2246755.65	3.00
POINTSOURCE		AC061	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271217.22	2246785.16	3.00
POINTSOURCE		AC062	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271218.09	2246757.38	3.00
POINTSOURCE		AC063	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271255.42	2246779.95	3.00
POINTSOURCE		AC064	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271253.68	2246753.04	3.00
POINTSOURCE		AC065	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271291.88	2246782.56	3.00
POINTSOURCE		AC066	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271290.14	2246753.91	3.00
POINTSOURCE		AC067	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271339.62	2246779.95	3.00
POINTSOURCE		AC068	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271369.13	2246778.22	3.00
POINTSOURCE		AC069	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271335.28	2246746.97	3.00
POINTSOURCE		AC070	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271369.13	2246748.70	3.00
POINTSOURCE		AC071	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271318.78	2246674.05	3.00
POINTSOURCE		AC072	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271350.03	2246673.18	3.00
POINTSOURCE		AC073	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271317.92	2246642.80	3.00
POINTSOURCE		AC074	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271348.30	2246642.80	3.00
POINTSOURCE		AC075	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271319.65	2246612.42	3.00

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		AC076	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271343.96	2246611.55	3.00
POINTSOURCE		AC077	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271215.49	2246614.15	3.00
POINTSOURCE		AC078	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271248.47	2246615.02	3.00
POINTSOURCE		AC079	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271108.72	2246720.06	3.00
POINTSOURCE		AC080	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271492.40	2246786.03	3.00
POINTSOURCE		AC081	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271491.53	2246753.91	3.00
POINTSOURCE		AC082	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271527.12	2246783.42	3.00
POINTSOURCE		AC083	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271526.25	2246756.51	3.00
POINTSOURCE		AC084	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271567.92	2246754.78	3.00
POINTSOURCE		AC085	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271569.65	2246786.03	3.00
POINTSOURCE		AC086	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271601.77	2246786.90	3.00
POINTSOURCE		AC087	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271597.43	2246752.17	3.00
POINTSOURCE		AC088	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271520.17	2246950.09	3.00
POINTSOURCE		AC089	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271519.31	2246922.31	3.00
POINTSOURCE		AC090	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271554.03	2246946.62	3.00
POINTSOURCE		AC091	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271552.29	2246919.71	3.00
POINTSOURCE		AC092	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271594.83	2246944.88	3.00
POINTSOURCE		AC093	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271592.22	2246920.58	3.00
POINTSOURCE		AC094	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271626.94	2246944.88	3.00
POINTSOURCE		AC095	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271625.21	2246919.71	3.00
POINTSOURCE		AC096	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271682.50	2246943.15	3.00
POINTSOURCE		AC097	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271683.37	2246920.58	3.00
POINTSOURCE		AC098	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271714.62	2246944.01	3.00
POINTSOURCE		AC099	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271714.62	2246918.84	3.00
POINTSOURCE		AC100	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271743.26	2246918.84	3.00
POINTSOURCE		AC101	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271745.00	2246944.88	3.00
POINTSOURCE		AC102	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271725.03	2246843.32	3.00
POINTSOURCE		AC103	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271750.21	2246845.92	3.00
POINTSOURCE		AC104	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271725.03	2246812.94	3.00
POINTSOURCE		AC105	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271752.81	2246818.15	3.00
POINTSOURCE		AC106	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271730.24	2246783.42	3.00
POINTSOURCE		AC107	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271755.42	2246787.76	3.00
POINTSOURCE		AC108	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271738.92	2246736.55	3.00
POINTSOURCE		AC109	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271764.97	2246740.89	3.00
POINTSOURCE		AC110	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271743.26	2246706.17	3.00
POINTSOURCE		AC111	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271769.31	2246711.38	3.00
POINTSOURCE		AC112	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271750.21	2246656.69	3.00
POINTSOURCE		AC113	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271778.85	2246662.76	3.00
POINTSOURCE		AC114	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271755.42	2246628.04	3.00
POINTSOURCE		AC115	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271786.67	2246633.25	3.00
POINTSOURCE		AC116	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271761.49	2246599.40	3.00
POINTSOURCE		AC117	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271788.40	2246604.60	3.00
POINTSOURCE		AC118	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271489.79	2246676.65	3.00
POINTSOURCE		AC119	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271517.57	2246675.79	3.00
POINTSOURCE		AC120	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271488.92	2246630.65	3.00
POINTSOURCE		AC121	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271514.10	2246630.65	3.00
POINTSOURCE		AC122	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271486.32	2246601.13	3.00
POINTSOURCE		AC123	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271518.44	2246600.26	3.00
POINTSOURCE		AC124	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271584.41	2246684.47	3.00
POINTSOURCE		AC125	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271609.58	2246687.07	3.00
POINTSOURCE		AC126	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271586.15	2246651.48	3.00
POINTSOURCE		AC127	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271615.66	2246654.95	3.00
POINTSOURCE		AC128	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271591.35	2246613.29	3.00
POINTSOURCE		AC129	76.2	76.2	76.2	Lw	76.2		900.00	0.00	540.00	3.00	g	6271618.26	2246621.10	3.00
POINTSOURCE		Pool1	112.3	112.3	112.3	Lw	112.3		900.00	0.00	0.00	5.00	a	6271206.37	2246684.47	5.00
POINTSOURCE		OUT01	103.1	103.1	103.1	Lw	103.1		900.00	0.00	0.00	5.00	a	6271084.84	2246620.01	5.00
POINTSOURCE		OUT02	103.1	103.1	103.1	Lw	103.1		900.00	0.00	0.00	5.00	a	6271682.93	2246870.01	5.00
POINTSOURCE		OUT03	103.1	103.1	103.1	Lw	103.1		900.00	0.00	0.00	5.00	a	6270812.27	2246808.38	5.00
POINTSOURCE		OUT04	103.1	103.1	103.1	Lw	103.1		900.00	0.00	0.00	5.00	a	6271471.13	2246718.10	5.00

Barrier(s)

Name	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)
BARRIEREXISTING		0						8.00	a		6271993.15	2246993.59	8.00	0.00
											6271915.02	2246915.47	8.00	0.00
											6271919.36	2246851.23	8.00	0.00
											6271930.65	2246777.44	8.00	0.00
											6271943.67	2246698.45	8.00	0.00
											6271980.99	2246576.06	8.00	0.00
											6272028.74	2246451.92	8.00	0.00
											6272082.56	2246340.81	8.00	0.00
BARRIEREXISTING		0						8.00	a		6270524.40	2246446.72	8.00	0.00
											6270523.53	2246506.61	8.00	0.00
											6271881.17	2246499.23	8.00	0.00
											6271919.36	2246413.73	8.00	0.00

Name	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)
											6271941.06	2246362.51	8.00	0.00
											6271994.02	2246264.42	8.00	0.00
BARRIEREXISTING		0						8.00	a		6271782.63	2247290.48	8.00	0.00
											6271784.80	2247117.96	8.00	0.00
											6271760.92	2247100.60	8.00	0.00
											6271172.82	2247097.34	8.00	0.00
											6271154.37	2247119.04	8.00	0.00
											6271156.54	2247197.17	8.00	0.00
BARRIEREXISTING		0						8.00	a		6271078.42	2247186.32	8.00	0.00
											6271076.25	2247124.47	8.00	0.00
											6271046.95	2247100.60	8.00	0.00
											6270529.37	2247103.85	8.00	0.00
											6270530.46	2247159.19	8.00	0.00
BARRIEREXISTING		0						8.00	a		6271908.85	2247209.48	8.00	0.00
											6271908.85	2247173.02	8.00	0.00
											6271993.48	2247088.39	8.00	0.00
											6272434.89	2247081.88	8.00	0.00

APPENDIX 11.1:

CONSTRUCTION MODEL

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12975 - Moreno Valley Trade Center

CadnaA Noise Prediction Model: 14505-02_Construction.cna
Date: 25.10.22
Analyst: B. Lawson

Calculation Configuration

Configuration	
Parameter	**Value**
General	
Max. Error (dB)	**0.00**
Max. Search Radius (#(Unit,LEN))	**2000.01**
Min. Dist Src to Rcvr	**0.00**
Partition	
Raster Factor	**0.50**
Max. Length of Section (#(Unit,LEN))	**999.99**
Min. Length of Section (#(Unit,LEN))	**1.01**
Min. Length of Section (%)	**0.00**
Proj. Line Sources	**On**
Proj. Area Sources	**On**
Ref. Time	
Reference Time Day (min)	**960.00**
Reference Time Night (min)	**480.00**
Daytime Penalty (dB)	**0.00**
Recr. Time Penalty (dB)	**5.00**
Night-time Penalty (dB)	**10.00**
DTM	
Standard Height (m)	**0.00**
Model of Terrain	**Triangulation**
Reflection	
max. Order of Reflection	**2**
Search Radius Src	**100.00**
Search Radius Rcvr	**100.00**
Max. Distance Source - Rcvr	**1000.00 1000.00**
Min. Distance Rvcr - Reflector	**1.00 1.00**
Min. Distance Source - Reflector	**0.10**
Industrial (ISO 9613)	
Lateral Diffraction	**some Obj**
Obst. within Area Src do not shield	**On**
Screening	**Incl. Ground Att. over Barrier**
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	**3.0 20.0 0.0**
Temperature (#(Unit,TEMP))	**10**
rel. Humidity (%)	**70**
Ground Absorption G	**0.50**
Wind Speed for Dir. (#(Unit,SPEED))	**3.0**
Roads (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	67.4	-37.4	64.4	80.0	0.0	0.0				5.00	a	6270562.17	2247104.83	5.00
RECEIVERS		R2	68.0	-36.8	65.0	80.0	0.0	0.0				5.00	a	6271717.94	2247099.58	5.00
RECEIVERS		R3	66.3	-38.5	63.3	80.0	0.0	0.0				5.00	a	6271934.39	2246747.35	5.00
RECEIVERS		R4	74.6	-30.2	71.6	80.0	0.0	0.0				5.00	a	6271806.72	2246501.48	5.00
RECEIVERS		R5	74.7	-30.1	71.7	80.0	0.0	0.0				5.00	a	6270551.88	2246509.25	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)		
ConstructionArea		ConstructionArea001	121.4	16.6	16.6	73.2	-31.5	-31.5	PWL-Pt	116.6					8	a

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
ConstructionArea	8.00	a			6270525.32	2247047.00	8.00	0.00
					6271791.45	2247041.25	8.00	0.00
					6271794.03	2246932.21	8.00	0.00
					6271799.84	2246857.45	8.00	0.00
					6271812.78	2246764.02	8.00	0.00
					6271829.25	2246678.05	8.00	0.00
					6271843.65	2246619.16	8.00	0.00
					6271860.32	2246560.87	8.00	0.00

Name	Height		Coordinates			
	Begin	End	x	y	z	Ground
	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
			6271880.18	2246500.58	8.00	0.00
			6270521.40	2246509.37	8.00	0.00