Torrance Commerce Center Phase 3

NOISE AND VIBRATION IMPACT ANALYSIS

CITY OF TORRANCE

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LIST OF ABBREVIATED TERMS

(1)	Reference
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
mph	Miles per hour
PPV	Peak Particle Velocity
Project	Torrance Commerce Center Phase 3
REMEL	Reference Energy Mean Emission Level
RMS	Root-mean-square
VdB	Vibration Decibels

EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to determine the noise exposure and the necessary noise mitigation measures for the proposed Torrance Commerce Center Phase 3 development ("Project"). The Project is planned to consist of up to 730,000 square feet of industrial park use. This noise study has been prepared to satisfy applicable City of Torrance noise standards and significance criteria based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1)

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

TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS

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

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1 INTRODUCTION

This noise analysis has been completed to determine the noise impacts associated with the development of the proposed Torrance Commerce Center Phase 3 ("Project"). This noise study briefly describes the proposed Project, provides information regarding noise fundamentals, sets out the local regulatory setting, presents the study methods and procedures for transportation related CNEL traffic noise analysis, and evaluates the future exterior noise environment. In addition, this study includes an analysis of the potential Project-related long-term stationary-source operational noise and short-term construction noise and vibration impacts.

1.1 SITE LOCATION

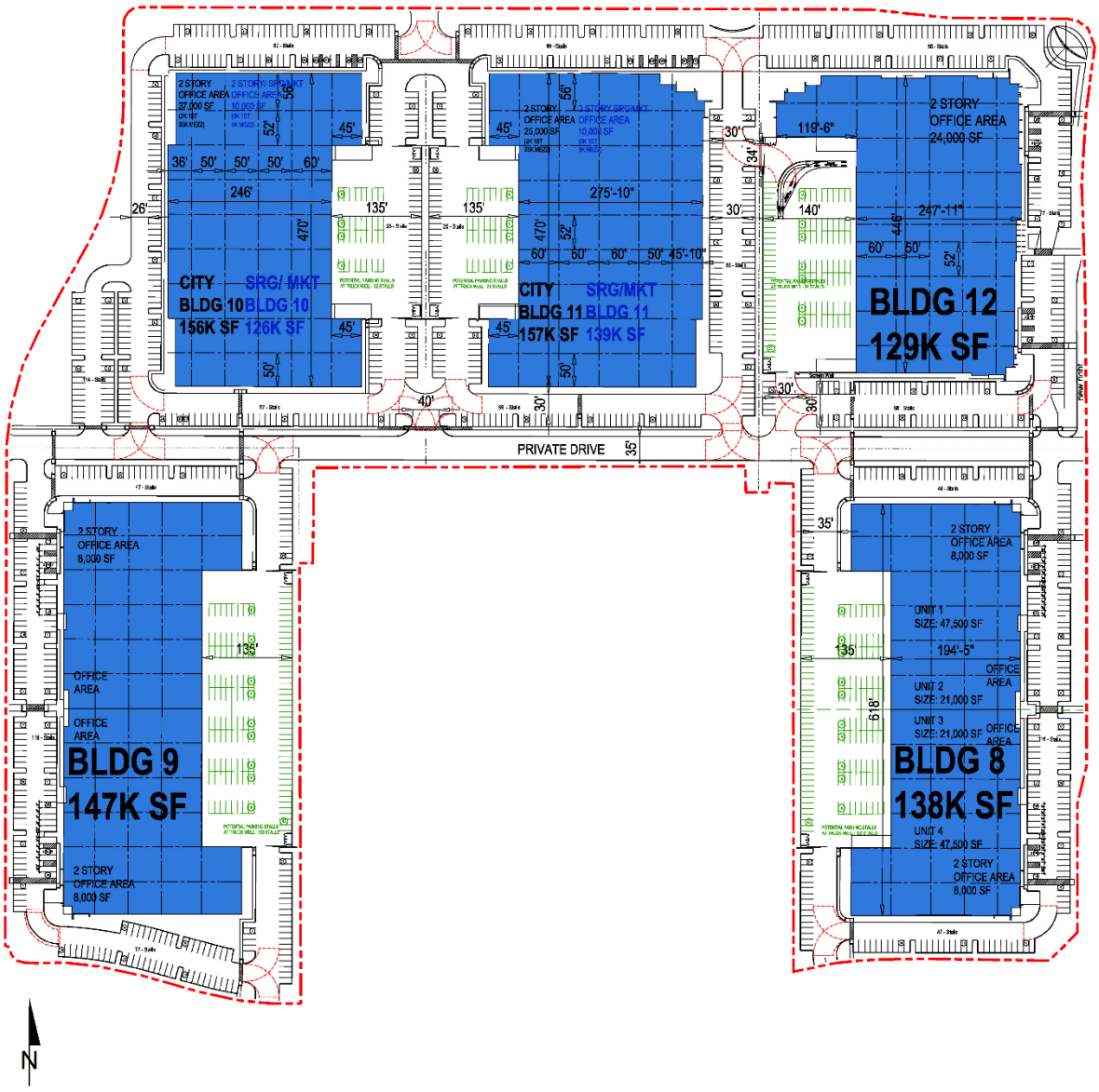
The Torrance Commerce Center Phase 3 Project is located on the southwest corner of Western Avenue and 190th street in the City of Torrance, as shown on Exhibit 1-A. The nearest sensitive residential land use is located northwest of the project site.

1.2 PROJECT DESCRIPTION

The proposed Project is planned to consist of up to 730,000 square feet of industrial park use (as shown on Exhibit 1-B) that will displace the existing uses, which previously was a part of the Toyota Campus. The on-site Project-related noise sources are expected to include: loading dock activity, roof-top air conditioning units, trash enclosure activity, parking lot vehicle movements, and truck movements. This noise analysis is intended to describe noise level impacts associated with the expected typical operational activities at the Project site.

EXHIBIT 1-A: LOCATION MAP

EXHIBIT 1-B: SITE PLAN



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2 FUNDAMENTALS

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

EXHIBIT 2-A: TYPICAL NOISE LEVELS

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

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

2.1 RANGE OF NOISE

Since the range of intensities that the human ear can detect is so large, the scale frequently used to measure intensity is a scale based on multiples of 10, the logarithmic scale. The scale for measuring intensity is the decibel scale. Each interval of 10 decibels indicates a sound energy ten times greater than before, which is perceived by the human ear as being roughly twice as loud. (2) The most common sounds vary between 40 dBA (very quiet) to 100 dBA (very loud). Normal conversation at three feet is roughly at 60 dBA, while loud jet engine noises equate to 110 dBA

at approximately 1,000 feet, which can cause serious discomfort. (3) Another important aspect of noise is the duration of the sound and the way it is described and distributed in time.

2.2 NOISE DESCRIPTORS

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

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

2.3 SOUND PROPAGATION

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

2.3.1 GEOMETRIC SPREADING

Sound from a localized source (i.e., a stationary point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a line source. (2)

2.3.2 GROUND ABSORPTION

The propagation path of noise from a highway to a receiver is usually very close to the ground. Noise attenuation from ground absorption and reflective wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually

sufficiently accurate for distances of less than 200 ft. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a parking lot or body of water), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receiver such as soft dirt, grass, or scattered bushes and trees), an excess ground attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance from a line source. (4)

2.3.3 ATMOSPHERIC EFFECTS

Receivers located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects. (2)

2.3.4 SHIELDING

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

2.4 NOISE CONTROL

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

2.5 NOISE BARRIER ATTENUATION

Effective noise barriers can reduce noise levels by 10 to 15 dBA, cutting the loudness of traffic noise in half. A noise barrier is most effective when placed close to the noise source or receiver. Noise barriers, however, do have limitations. For a noise barrier to work, it must block the line-of-sight path of sound from the noise source.

2.6 LAND USE COMPATIBILITY WITH NOISE

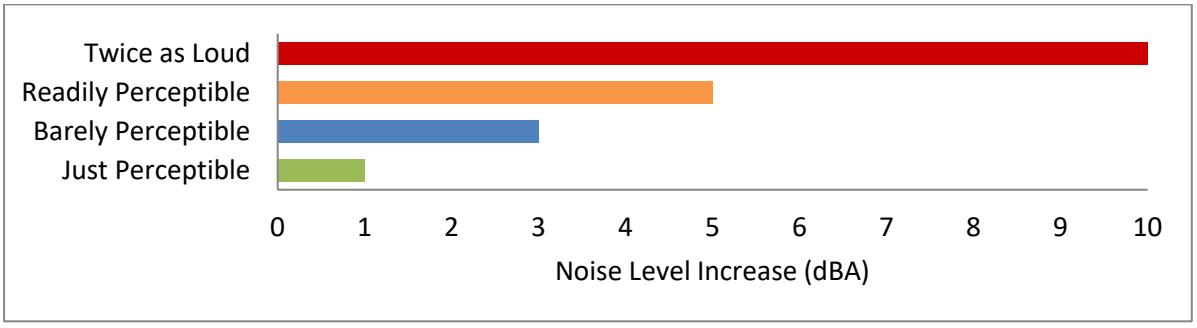
Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches, and residences are more sensitive to noise intrusion than are commercial or industrial developments and related activities. As ambient noise levels affect the perceived amenity or livability of a development,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

2.7 COMMUNITY RESPONSE TO NOISE

Approximately sixteen percent of the population has a very low tolerance for noise and will object to any noise not of their making. Consequently, even in the quietest environment, some complaints may occur. Twenty to thirty percent of the population will not complain even in very severe noise environments. (7 pp. 8-6) Thus, a variety of reactions can be expected from people exposed to any given noise environment.

Surveys have shown that community response to noise varies from no reaction to vigorous action for newly introduced noises averaging from 10 dB below existing to 25 dB above existing. (8) According to research originally published in the Noise Effects Handbook (7), the percentage of high annoyance ranges from approximately 0 percent at 45 dB or less, 10 percent are highly annoyed around 60 dB, and increases rapidly to approximately 70 percent being highly annoyed at approximately 85 dB or greater. Despite this variability in behavior on an individual level, the population can be expected to exhibit the following responses to changes in noise levels as shown on Exhibit 2-B. A change of 3 dBA is considered barely perceptible, and changes of 5 dBA are considered readily perceptible. (4)

EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION



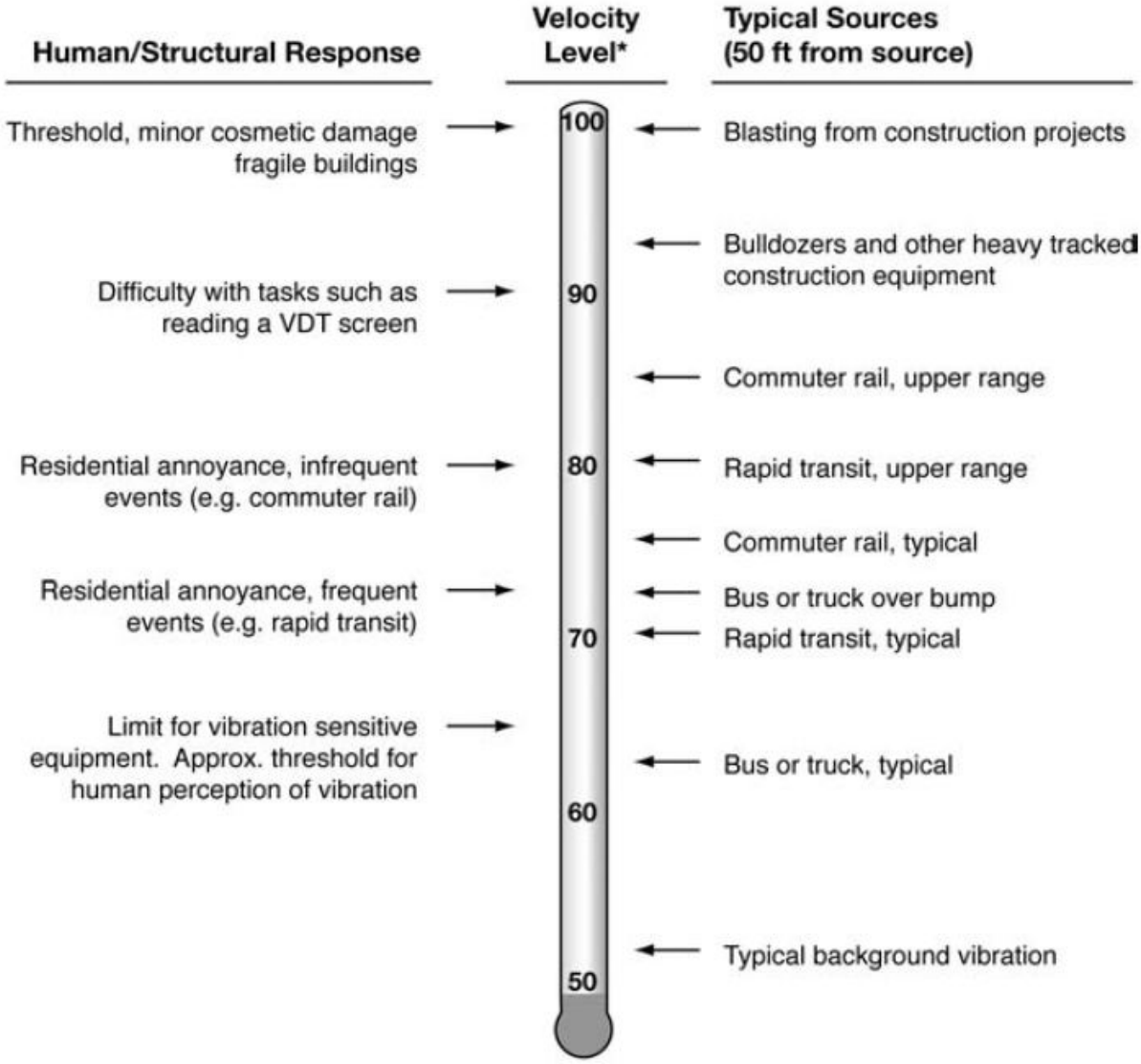
2.8 VIBRATION

Per the Federal Transit Administration (FTA) *Transit Noise Impact and Vibration Impact Assessment Manual* (8) , vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called structure-borne noise. Sources of ground-borne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, such as factory machinery, or transient, such as explosions. As is the case with airborne sound, ground-borne vibrations may be described by amplitude and frequency.

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

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

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



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

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

3 REGULATORY SETTING

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

3.2 CITY OF TORRANCE GENERAL PLAN NOISE ELEMENT

The City of Torrance General Plan Noise Element's goals and policies aim to minimize adverse noise impacts and to preserve high quality of life for city residents. Torrance will maintain a peaceful environment by identifying noise impacts and mitigating noise problems through acoustical treatments and appropriate land use policies. (10) To protect City of Torrance residents from excessive noise levels, the Noise Element contains the following four objectives:

N. I *To identify noise pollution and establish effective noise abatement methods*
N. 2 *To minimize transportation-related noise impacts*
N. 3 *To minimize noise incompatibilities between land uses*
N. 4 *To research and implement new means of noise abatement*

The noise policies specified in the City of Torrance Noise Element provide the guidelines necessary to satisfy these objectives. The noise criteria identified in the City of Torrance Noise Element (Table N-3) are guidelines to evaluate the land use compatibility of transportation-related noise. The compatibility criteria, shown on Exhibit 3-A, provides the City with a planning tool to gauge the compatibility of land uses relative to existing and future exterior noise levels. The *Noise/Land Use Compatibility Guidelines* indicate that the maximum exterior noise level standard for industrial land uses, such as the Project, is 75 dBA CNEL.

EXHIBIT 3-A: TORRANCE NOISE / LAND USE COMPATIBILITY GUIDELINES

Property Receiving Noise		Maximum Noise Level Ldn or CNEL, dB(A)	
Type of Use	**Land Use Designations**	**Interior**	**Exterior**
Residential[3]	Low Density Residential Low Medium Density Residential Medium Density Residential	45	60/65[1]
	Medium High Density Residential	45	65 / 70[2]
	High Density Residential	45	70[1]
Commercial and Office	General Commercial Commercial Center	--	70
	Residential Office	50	70
Industrial	Business Park Light Industrial Heavy Industrial	55	75
Public and Medical Uses	Public/Quasi-Public/Open Space	50	65
	Hospital/Medical	50	70
Airport	Airport	--	70

1. The normally acceptable standard is 60 db(A). The higher standard is acceptable subject to inclusion of noise-reduction features in project design and construction.
2. Maximum exterior noise levels up to 70 dB CNEL are allowed for Multiple-Family Housing.
3. Regarding aircraft-related noise, the maximum acceptable exposure for new residential development is 60 dB(A) CNEL.

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

3.3 CITY OF TORRANCE MUNICIPAL CODE

The City of Torrance Municipal Code (Municipal Code) establishes operational noise standards applicable to the Torrance Commerce Center Phase 3 Project. For the purposes of regulating operational noise, the Municipal Code at Chapter 6 Noise Regulation, Article 7, Section 46.7.2 divides the City into four "Noise Regions." The Project site is in Noise Region 1 as shown on Figure N-5 of City of Torrance General Plan and Article 8 Exhibit A of the Municipal Code.

Municipal Code Section 46.7.2[b] establishes exterior noise level standards for the noise sensitive residential land uses within 500 feet of the City's Noise Region 1 boundaries. In this context, and for the purposes of this analysis, the Municipal Code standards presented at Table 3-1 are employed in evaluation of noise levels that would be received at the nearest noise sensitive residential land uses located within Region 4. The City of Torrance Municipal Code noise standards are included in Appendix 3.1.

TABLE 3-1: OPERATIONAL NOISE LEVEL STANDARDS

Jurisdiction	Land Use	Time Period	Noise Level Standard (dBA L_{eq})[2]
City of Torrance[1]	Residential (Region 4)[1]	Daytime (7:00 a.m. - 10:00 p.m.)	55
		Nighttime (10:00 p.m. - 7:00 a.m.)	50

[1] City of Torrance Municipal Code, Article 7, Section 46.7.2(a) (Appendix A).

[2] L_{eq} represents a steady state sound level containing the same total energy as a time varying signal over a given sample period.

3.4 CONSTRUCTION NOISE STANDARDS

To control noise impacts associated with construction, the City has established limits to the hours of construction activities in Section 46.3.1[a] of the City's Municipal Code. Per Section 46.3.1[a] construction activities are permitted within the hours of 7:30 a.m. to 6:00 p.m. Monday through Friday and 9:00 a.m. to 5:00 p.m. on Saturdays; with no activity allowed on Sundays and holidays. (11) In addition, the Municipal Code identifies an exterior construction noise level limit of 50 dBA L_{eq} for all other time periods outside the permitted hours. Section 46.3.1[b] indicates that The Community Development Director may allow expanded hours and days of construction if unusual circumstances and conditions exist. Such requests must be made in writing and must receive approval by the Director prior to any expansion of the hour and day restrictions listed.

While the City establishes limits to the hours during which construction activity may take place, neither the City's General Plan nor Municipal Code establish numeric maximum acceptable construction source noise levels at potentially affected receivers during the permitted construction hours. Therefore, a numerical construction threshold based on Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual* is used for analysis of daytime construction impacts, as discussed below. According to the FTA, local noise ordinances are typically not very useful in evaluating construction noise. They usually relate to nuisance and hours of allowed activity, and sometimes specify limits in terms of maximum levels, but are generally not practical for assessing the impact of a construction project. Project construction noise criteria should account for the existing noise environment, the absolute noise levels during construction activities, the duration of the construction, and the adjacent land use. Due to the lack of standardized construction noise thresholds, the FTA provides guidelines that can be considered reasonable criteria for construction noise assessment. The FTA considers a daytime exterior construction noise level of 80 dBA L_{eq} as a reasonable threshold for noise sensitive residential land use. (8 p. 179)

3.5 CONSTRUCTION VIBRATION STANDARDS

Construction activity can result in varying degrees of ground-borne vibration, depending on the equipment and methods used, distance to the affected structures and soil type. Construction vibration is generally associated with pile driving and rock blasting. Other construction equipment such as air compressors, light trucks, hydraulic loaders, etc., generates little or no ground vibration. (8)

To analyze vibration impacts originating from the operation and construction of the Torrance Commerce Center Phase 3, vibration-generating activities are appropriately evaluated against standards established under a City's Municipal Code, if such standards exist. However, the City of Torrance does not identify specific vibration level limits. Therefore, for analysis purposes, the Caltrans *Transportation and Construction Vibration Guidance Manual*, (12 p. 38) Table 19, vibration damage are used in this noise study to assess potential temporary construction-related impacts at adjacent building locations. The nearest noise sensitive buildings adjacent to the Project site can best be described as "older residential structures" with a maximum acceptable continuous vibration threshold of 0.3 PPV (in/sec).

4 SIGNIFICANCE CRITERIA

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

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

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

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

4.1 NOISE LEVEL INCREASES (THRESHOLD A)

Noise level increases resulting from the Project are evaluated based on the Appendix G CEQA Guidelines. Under CEQA, consideration must be given to the magnitude of the increase, the existing baseline ambient noise levels, and the location of receivers to determine if a noise increase represents a significant adverse environmental impact. This approach recognizes *that there is no single noise increase that renders the noise impact significant.* (13) 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.

4.1.1 NOISE SENSITIVE RECEIVERS

The Federal Interagency Committee on Noise (FICON) (14) 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. (13) For example, if the ambient noise environment is quiet (<60 dBA) and the new noise source greatly increases the noise levels, an impact may occur if the noise criteria may be exceeded. Therefore, for this analysis, a *readily perceptible* 5 dBA or greater project-related noise level increase is considered a significant impact when the without project noise levels are below 60 dBA. Per the FICON, in areas where the without project noise levels range from 60 to 65 dBA, a 3 dBA *barely perceptible* noise level increase appears to be

appropriate for most people. When the without project noise levels already exceed 65 dBA, any increase in community noise louder than 1.5 dBA or greater is considered a significant impact if the noise criteria for a given land use is exceeded, since it likely contributes to an existing noise exposure exceedance. The FICON guidance provides an established source of criteria to assess the impacts of substantial temporary or permanent increase in baseline ambient noise levels. Based on the FICON criteria, the amount to which a given noise level increase is considered acceptable is reduced when the without Project (baseline) noise levels are already shown to exceed certain land-use specific exterior noise level criteria. The specific levels are based on typical responses to noise level increases of 5 dBA or *readily perceptible*, 3 dBA or *barely perceptible*, and 1.5 dBA depending on the underlying without Project noise levels for noise-sensitive uses. These levels of increases and their perceived acceptance are consistent with guidance provided by both the Federal Highway Administration (4 p. 9) and Caltrans (15 p. 2_48).

4.1.1 NON-NOISE SENSITIVE RECEIVERS

The City of Torrance General Plan Noise Element, Table N-3, *Torrance Noise/Land Use Compatibility Guidelines* was used to establish the satisfactory noise levels of significance for non-noise-sensitive land uses in the Project study area. As previously shown on Exhibit 3-A, the *maximum acceptable* exterior noise level for non-noise-sensitive land use, such as commercial and office, is 70 dBA CNEL and 75 dBA CNEL for industrial uses. To determine if Project-related traffic noise level increases are significant at off-site non-noise-sensitive land uses, a *barely perceptible* 3 dBA criteria is used. (4) When the without Project noise levels are greater than the *normally acceptable* 70 dBA CNEL land use compatibility criteria, a *barely perceptible* 3 dBA or greater noise level increase is considered a *significant impact* since the noise level criteria is already exceeded.

4.2 VIBRATION (THRESHOLD B)

As described in Section 3.5, the vibration impacts originating from the construction of Torrance Commerce Center Phase 3, vibration-generating activities are appropriately evaluated using the Caltrans vibration damage thresholds to assess potential temporary construction-related impacts at adjacent building locations. The nearest noise sensitive buildings adjacent to the Project site can best be described as “older residential structures” with a maximum acceptable continuous vibration threshold of 0.3 PPV (in/sec).

4.3 CEQA GUIDELINES NOT FURTHER ANALYZED (THRESHOLD C)

CEQA Noise Threshold C applies when there are nearby public and private airports and/or air strips and focuses on land use compatibility of the Project to nearby airports and airstrips. The Project site is not located within two miles of an airport or airstrip. The closest airport is the Torrance Airport located roughly 3.6 miles southwest of the Project site. As such, the Project site would not be exposed to excessive noise levels from airport operations, and therefore, impacts are considered *less than significant,* and no further noise analysis is conducted in relation to Appendix G to the CEQA Guidelines, Noise Threshold C.

4.4 SIGNIFICANCE CRITERIA SUMMARY

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

TABLE 4-1: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Receiving Land Use	Condition(s)	Significance Criteria	
			Daytime	Nighttime
Off-Site	Noise-Sensitive[1]	if ambient is < 60 dBA CNEL	≥ 5 dBA CNEL Project increase	
		if ambient is 60 - 65 dBA CNEL	≥ 3 dBA CNEL Project increase	
		if ambient is > 65 dBA CNEL	≥ 1.5 dBA CNEL Project increase	
	Non-Noise-Sensitive[2]	if ambient is > 70 dBA CNEL	≥ 3 dBA CNEL Project increase	
Operational	Noise-Sensitive	See Table 3-1	55 dBA L_{eq}	50 dBA L_{eq}
		if ambient is < 60 dBA L_{eq}[1]	≥ 5 dBA L_{eq} Project increase	
		if ambient is 60 - 65 dBA L_{eq}[1]	≥ 3 dBA L_{eq} Project increase	
		if ambient is > 65 dBA L_{eq}[1]	≥ 1.5 dBA L_{eq} Project increase	
Construction	Noise-Sensitive	Permitted hours of 7:30 a.m. to 6:00 p.m. on weekdays, 9:00 a.m. to 5:00 p.m. on Saturdays with no activity on Sundays and federal holidays[3]		
		Noise Level Threshold	80 dBA L_{eq}[4]	50 dBA L_{eq}[3]
		Building Damage Vibration Threshold[5]	0.5 PPV (in/sec)	
		Human Annoyance Vibration Threshold[5]	0.04 PPV (in/sec)	

[1] FICON, 1992.
[2] City of Torrance General Plan Noise Element Table N-3
[3] City of Torrance Municipal Code, Section 46.3.1 (Appendix 3.1).
[4] Federal Transit Administration, Transit Noise and Vibration Impact Assessment.
[5] Caltrans Transportation and Construction Vibration Guidance Manual, April 2020, Tables 19 & 20, p. 38.
"Daytime" = 7:00 a.m. - 10:00 p.m.; "Nighttime" = 10:00 p.m. - 7:00 a.m.

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5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, 24-hour noise level measurements were taken at 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 provides the boundaries of the Project study area and the noise level measurement locations. To fully describe the existing noise conditions, noise level measurements were collected by Urban Crossroads, Inc. on Monday, December 6th, 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 equivalent daytime and nighttime hourly noise levels. The long-term noise readings were recorded using Piccolo Type 2 integrating sound level meter and dataloggers. The Piccolo sound level meters were calibrated using a Larson-Davis calibrator, Model CAL 150. All noise meters were programmed in "slow" mode to record noise levels in "A" weighted form. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (16)

5.2 NOISE MEASUREMENT LOCATIONS

The long-term noise level measurements were positioned as close to the nearest sensitive receiver locations as possible to assess the existing ambient hourly noise levels surrounding the Project site. Both Caltrans and the FTA recognize that it is not reasonable to collect noise level measurements that can fully represent every part of a private yard, patio, deck, or balcony normally used for human activity when estimating impacts for new development projects. This is demonstrated in the Caltrans general site location guidelines which indicate that, *sites must be free of noise contamination by sources other than sources of interest. Avoid sites located near sources such as barking dogs, lawnmowers, pool pumps, and air conditioners unless it is the express intent of the analyst to measure these sources*. (2) Further, FTA guidance states, t*hat it is not necessary nor recommended that existing noise exposure be determined by measuring at every noise-sensitive location in the project area. Rather, the recommended approach is to characterize the noise environment for clusters of sites based on measurements or estimates at representative locations in the community*. (8)

Based on recommendations of Caltrans and the FTA, it is not necessary to collect measurements at each individual building or residence, because each receiver measurement represents a group of buildings that share acoustical equivalence. (8) In other words, the area represented by the receiver shares similar shielding, terrain, and geometric relationship to the reference noise source. Receivers represent a location of noise sensitive areas and are used to estimate the future noise level impacts. Collecting reference ambient noise level measurements at the nearby sensitive receiver locations allows for a comparison of the before and after Project noise levels

and is necessary to assess potential noise impacts due to the Project's contribution to the ambient noise levels.

5.3 NOISE MEASUREMENT RESULTS

The noise measurements presented below focus on the equivalent or the hourly energy average 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.

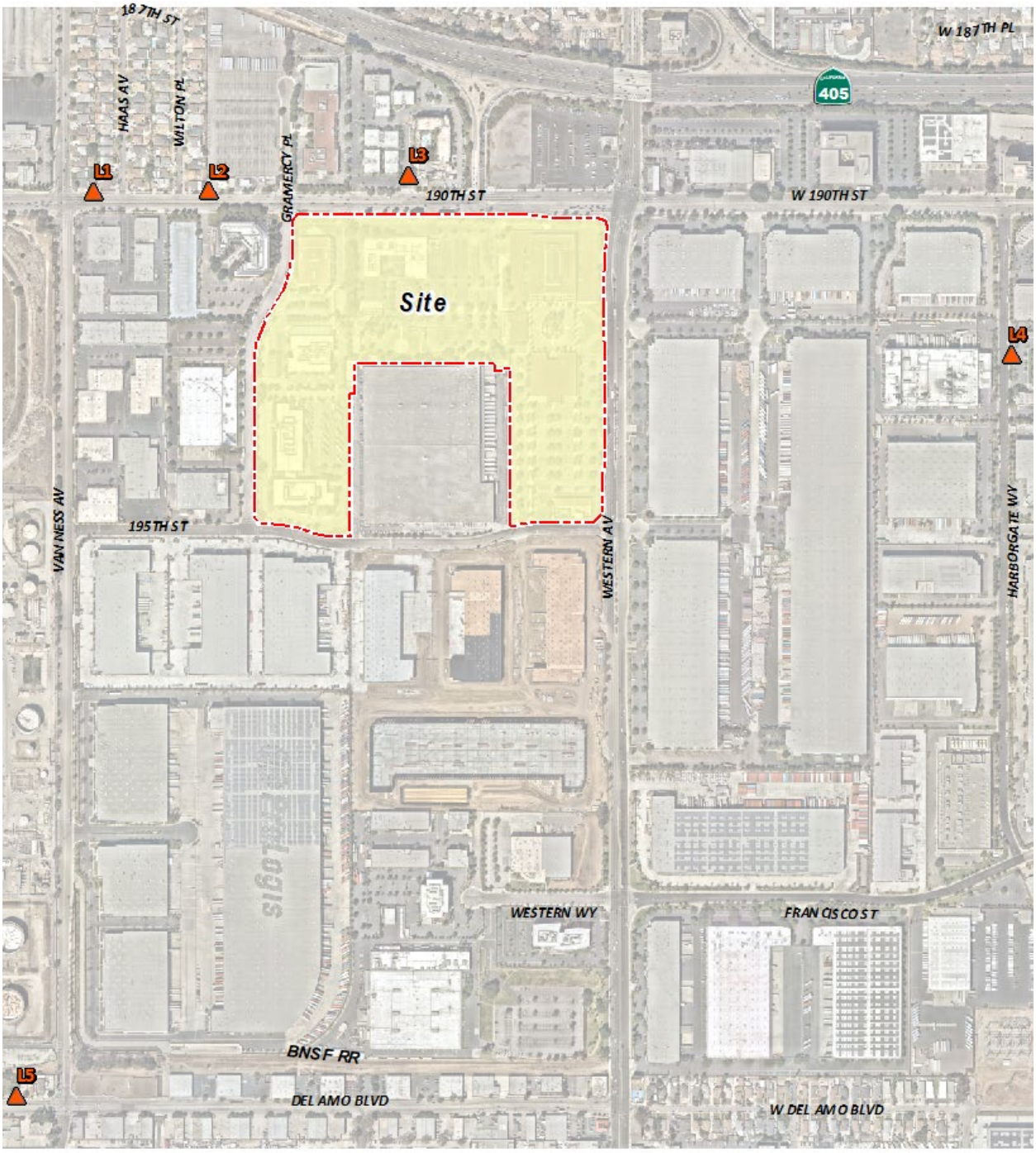
TABLE 5-1: AMBIENT NOISE LEVEL MEASUREMENTS

Location[1]	Description	Energy Average Noise Level (dBA L_{eq})[2]	
		Daytime	Nighttime
L1	Located northwest of the Project site near single-family residence at 18931 Haas Avenue.	76.3	71.6
L2	Located northwest of the Project site near single-family residence at 18932 Wilton Place.	74.5	70.6
L3	Located north of the Project site near Sonesta Select Los Angeles Torrance at 1925 West 190th Street.	64.4	60.6
L4	Located east of the Project site near Extended Stay America - Los Angeles Torrance Harbor at 19200 Harborgate Way.	66.0	57.9
L5	Located southwest of the Project site near single-family residence at 2063 Del Amo Boulevard.	66.7	61.5

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

Table 5-1 provides the equivalent 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 of the daytime and nighttime hours.

EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS



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6 TRAFFIC NOISE METHODS AND PROCEDURES

The following section outlines the methods and procedures used to estimate and analyze the future traffic noise environment. Consistent with City of Torrance *Land Use Compatibility for Community Noise Environments* Guidelines for Land Use Planning (see Exhibit 3-A), all transportation related noise levels are presented in terms of the 24-hour CNEL's.

6.1 FHWA TRAFFIC NOISE PREDICTION MODEL

The expected roadway noise level increases from vehicular traffic were calculated by Urban Crossroads, Inc. using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108. (17) This methodology is commonly used to describe the off-site traffic noise levels throughout California and is consistent with the City of Torrance General Plan Noise Element.

The FHWA Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). In California the national REMELs are substituted with the California Vehicle Noise (Calveno) Emission Levels. (18) Adjustments are then made to the REMEL to account for: the roadway classification (e.g., collector, secondary, major or arterial), the roadway active width (i.e., the distance between the center of the outermost travel lanes on each side of the roadway), the total average daily traffic (ADT), the travel speed, the percentages of automobiles, medium trucks, and heavy trucks in the traffic volume, the roadway grade, the angle of view (e.g., whether the roadway view is blocked), the site conditions ("hard" or "soft" relates to the absorption of the ground, pavement, or landscaping), and the percentage of total ADT which flows each hour throughout a 24-hour period. Research conducted by Caltrans has shown that the use of soft site conditions is appropriate for the application of the FHWA traffic noise prediction model used in this analysis. (19)

6.1.1 OFF-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

Table 6-1 presents the roadway parameters used to assess the Project's off-site transportation noise impacts. Table 6-1 identifies the twenty 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 Torrance General Plan Circulation Element, and the posted vehicle speeds. The ADT volumes used in this study area presented on Table 6-2 are based on *Torrance Commerce Center Phase 3 Traffic Study by RK Engineering Group, Inc.* for the following traffic scenarios. (20)

1. Existing (2021)
2. Existing (2021) + Project
3. Opening Year (2023) (Existing traffic plus Ambient Growth)
4. Opening Year + Project (2023) (Existing traffic plus Ambient Growth plus Proposed Project)

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

TABLE 6-1: OFF-SITE ROADWAY PARAMETERS

ID	Roadway	Segment	Classification[1]	Receiving Land Use[2]	Distance from Centerline to Receiving Land Use (Feet)[3]	Vehicle Speed (mph)
1	Van Ness Av.	n/o 190th St.	Minor Arterial	Sensitive	50'	35
2	Van Ness Av.	s/o 190th St.	Minor Arterial	Non-Sensitive	50'	35
3	Van Ness Av.	s/o 195th St.	Minor Arterial	Sensitive	50'	35
4	Van Ness Av.	s/o Del Amo Blvd.	Minor Arterial	Non-Sensitive	50'	35
5	Western Av.	n/o I-405 NB Ramp	Major Arterial	Non-Sensitive	67'	40
6	Western Av.	n/o 190th St.	Major Arterial	Non-Sensitive	67'	40
7	Western Av.	s/o 190th St.	Major Arterial	Non-Sensitive	67'	40
8	Western Av.	s/o 195th St.	Major Arterial	Non-Sensitive	67'	40
9	Western Av.	n/o Del Amo Blvd.	Major Arterial	Sensitive	67'	40
10	Western Av.	s/o Del Amo Blvd.	Major Arterial	Sensitive	67'	40
11	190th St.	w/o Van Ness Av.	Major Arterial	Non-Sensitive	67'	45
12	190th St.	e/o Van Ness Av.	Major Arterial	Sensitive	67'	45
13	190th St.	w/o Western Av.	Major Arterial	Non-Sensitive	67'	45
14	195th St.	w/o Gramercy Pl.	Collector	Non-Sensitive	40'	25
15	Del Amo Blvd.	w/o Van Ness Av.	Major Arterial	Sensitive	61'	35

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

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

TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic Volumes[1]			
			Existing		Opening Year (2023)	
			Without Project	With Project	Without Project	With Project
1	Van Ness Av.	n/o 190th St.	13,250	13,742	13,400	13,892
2	Van Ness Av.	s/o 190th St.	12,680	13,049	12,820	13,189
3	Van Ness Av.	s/o 195th St.	12,620	13,112	12,860	13,352
4	Van Ness Av.	s/o Del Amo Blvd.	10,840	11,086	10,970	11,216
5	Western Av.	n/o I-405 NB Ramp	22,560	23,052	22,770	23,262
6	Western Av.	n/o 190th St.	30,180	31,730	30,480	32,030
7	Western Av.	s/o 190th St.	29,610	30,840	29,890	31,120
8	Western Av.	s/o 195th St.	29,800	30,292	30,090	30,582
9	Western Av.	n/o Del Amo Blvd.	31,290	31,782	31,600	32,092
10	Western Av.	s/o Del Amo Blvd.	25,770	26,262	26,030	26,522
11	190th St.	w/o Van Ness Av.	26,640	27,378	26,920	27,658
12	190th St.	e/o Van Ness Av.	25,290	26,151	25,560	26,421
13	190th St.	w/o Western Av.	25,060	25,700	25,310	25,950
14	195th St.	w/o Gramercy Pl.	700	1,561	700	1,561
15	Del Amo Blvd.	w/o Van Ness Av.	14,330	14,576	14,480	14,726

[1] Torrance Commerce Center Phase 3 Traffic Study, RK Engineering Group, Inc.

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

TABLE 6-3: TIME OF DAY VEHICLE SPLITS

Vehicle Type	Time of Day Splits			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%

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

TABLE 6-4: WITHOUT PROJECT VEHICLE MIX

Classification	Total % Traffic Flow			Total
	Autos	Medium Trucks	Heavy Trucks	
All Segments	97.02%	2.36%	0.62%	100.00%

Caltrans Data Branch Annual Average Daily Truck Traffic on the California Highways System, 2020.

TABLE 6-5: EXISTING WITH PROJECT VEHICLE MIX

ID	Roadway	Segment	With Project[1]			
			Autos	Medium Trucks	Heavy Trucks	Total[2]
1	Van Ness Av.	n/o 190th St.	96.66%	2.31%	1.03%	100.00%
2	Van Ness Av.	s/o 190th St.	96.74%	2.32%	0.94%	100.00%
3	Van Ness Av.	s/o 195th St.	96.64%	2.31%	1.05%	100.00%
4	Van Ness Av.	s/o Del Amo Blvd.	96.80%	2.33%	0.87%	100.00%
5	Western Av.	n/o I-405 NB Ramp	96.81%	2.33%	0.86%	100.00%
6	Western Av.	n/o 190th St.	96.53%	2.30%	1.17%	100.00%
7	Western Av.	s/o 190th St.	96.62%	2.31%	1.07%	100.00%
8	Western Av.	s/o 195th St.	96.86%	2.34%	0.80%	100.00%
9	Western Av.	n/o Del Amo Blvd.	96.86%	2.34%	0.80%	100.00%
10	Western Av.	s/o Del Amo Blvd.	96.83%	2.34%	0.83%	100.00%
11	190th St.	w/o Van Ness Av.	96.75%	2.32%	0.93%	100.00%
12	190th St.	e/o Van Ness Av.	96.69%	2.32%	0.99%	100.00%
13	190th St.	w/o Western Av.	96.77%	2.33%	0.90%	100.00%
14	195th St.	w/o Gramercy Pl.	91.49%	1.63%	6.87%	100.00%
15	Del Amo Blvd.	w/o Van Ness Av.	96.85%	2.34%	0.81%	100.00%

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

TABLE 6-6: OPENING YEAR 2023 WITH PROJECT VEHICLE MIX

ID	Roadway	Segment	With Project[1]			
			Autos	Medium Trucks	Heavy Trucks	Total[2]
1	Van Ness Av.	n/o 190th St.	96.67%	2.31%	1.02%	100.00%
2	Van Ness Av.	s/o 190th St.	96.74%	2.32%	0.94%	100.00%
3	Van Ness Av.	s/o 195th St.	96.65%	2.31%	1.04%	100.00%
4	Van Ness Av.	s/o Del Amo Blvd.	96.80%	2.33%	0.87%	100.00%
5	Western Av.	n/o I-405 NB Ramp	96.81%	2.33%	0.86%	100.00%
6	Western Av.	n/o 190th St.	96.54%	2.30%	1.17%	100.00%
7	Western Av.	s/o 190th St.	96.62%	2.31%	1.07%	100.00%
8	Western Av.	s/o 195th St.	96.86%	2.34%	0.80%	100.00%
9	Western Av.	n/o Del Amo Blvd.	96.87%	2.34%	0.79%	100.00%
10	Western Av.	s/o Del Amo Blvd.	96.83%	2.34%	0.83%	100.00%
11	190th St.	w/o Van Ness Av.	96.75%	2.32%	0.92%	100.00%
12	190th St.	e/o Van Ness Av.	96.69%	2.32%	0.99%	100.00%
13	190th St.	w/o Western Av.	96.77%	2.33%	0.90%	100.00%
14	195th St.	w/o Gramercy Pl.	91.49%	1.63%	6.87%	100.00%
15	Del Amo Blvd.	w/o Van Ness Av.	96.85%	2.34%	0.81%	100.00%

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

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7 OFF-SITE TRAFFIC NOISE ANALYSIS

To assess the off-site transportation CNEL noise level impacts associated with the proposed Project, noise contours were developed based on the Torrance Commerce Center Phase 3 *Traffic Analysis*. (20) Noise contour boundaries represent the equal levels of noise exposure and are measured in CNEL from the center of the roadway.

7.1 TRAFFIC NOISE CONTOURS

Noise contours were used to assess the Project's incremental traffic-related noise impacts at land uses adjacent to roadways conveying Project traffic. The noise contours represent the distance to noise levels of a constant value and are measured from the center of the roadway for the 70, 65, and 60 dBA noise levels. The noise contours do not consider the effect of any existing noise barriers or topography that may attenuate ambient noise levels. In addition, because the noise contours reflect modeling of vehicular noise on area roadways, they appropriately do not reflect noise contributions from the surrounding stationary noise sources within the Project study area. Tables 7-1 to 7-4 present a summary of the exterior traffic noise levels for each traffic condition. Appendix 7.1 includes the traffic noise level contours worksheets.

TABLE 7-1: EXISTING WITHOUT PROJECT CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Van Ness Av.	n/o 190th St.	Sensitive	65.4	RW	RW	115
2	Van Ness Av.	s/o 190th St.	Non-Sensitive	65.2	RW	RW	112
3	Van Ness Av.	s/o 195th St.	Sensitive	65.2	RW	RW	112
4	Van Ness Av.	s/o Del Amo Blvd.	Non-Sensitive	64.6	RW	RW	101
5	Western Av.	n/o I-405 NB Ramp	Non-Sensitive	67.3	RW	96	206
6	Western Av.	n/o 190th St.	Non-Sensitive	68.6	RW	116	251
7	Western Av.	s/o 190th St.	Non-Sensitive	68.5	RW	115	247
8	Western Av.	s/o 195th St.	Non-Sensitive	68.5	RW	115	248
9	Western Av.	n/o Del Amo Blvd.	Sensitive	68.7	55	119	257
10	Western Av.	s/o Del Amo Blvd.	Sensitive	67.9	RW	105	225
11	190th St.	w/o Van Ness Av.	Non-Sensitive	69.3	60	130	281
12	190th St.	e/o Van Ness Av.	Sensitive	69.1	58	126	271
13	190th St.	w/o Western Av.	Non-Sensitive	69.1	58	125	270
14	195th St.	w/o Gramercy Pl.	Non-Sensitive	51.4	RW	RW	RW
15	Del Amo Blvd.	w/o Van Ness Av.	Sensitive	64.4	RW	56	121

[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 the receiving adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-2: EXISTING WITH PROJECT CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Van Ness Av.	n/o 190th St.	Sensitive	66.1	RW	59	127
2	Van Ness Av.	s/o 190th St.	Non-Sensitive	65.8	RW	56	121
3	Van Ness Av.	s/o 195th St.	Sensitive	65.9	RW	58	124
4	Van Ness Av.	s/o Del Amo Blvd.	Non-Sensitive	65.0	RW	RW	107
5	Western Av.	n/o I-405 NB Ramp	Non-Sensitive	67.7	RW	101	218
6	Western Av.	n/o 190th St.	Non-Sensitive	69.4	61	132	283
7	Western Av.	s/o 190th St.	Non-Sensitive	69.2	59	127	274
8	Western Av.	s/o 195th St.	Non-Sensitive	68.8	56	120	259
9	Western Av.	n/o Del Amo Blvd.	Sensitive	69.0	58	124	267
10	Western Av.	s/o Del Amo Blvd.	Sensitive	68.2	RW	110	237
11	190th St.	w/o Van Ness Av.	Non-Sensitive	69.7	64	139	299
12	190th St.	e/o Van Ness Av.	Sensitive	69.6	63	136	293
13	190th St.	w/o Western Av.	Non-Sensitive	69.5	62	133	286
14	195th St.	w/o Gramercy Pl.	Non-Sensitive	60.5	RW	RW	43
15	Del Amo Blvd.	w/o Van Ness Av.	Sensitive	64.8	RW	59	127

[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 the receiving adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-3: OPENING YEAR 2023 WITHOUT PROJECT CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Van Ness Av.	n/o 190th St.	Sensitive	65.5	RW	RW	116
2	Van Ness Av.	s/o 190th St.	Non-Sensitive	65.3	RW	RW	113
3	Van Ness Av.	s/o 195th St.	Sensitive	65.3	RW	RW	113
4	Van Ness Av.	s/o Del Amo Blvd.	Non-Sensitive	64.6	RW	RW	102
5	Western Av.	n/o I-405 NB Ramp	Non-Sensitive	67.4	RW	96	208
6	Western Av.	n/o 190th St.	Non-Sensitive	68.6	RW	117	252
7	Western Av.	s/o 190th St.	Non-Sensitive	68.5	RW	116	249
8	Western Av.	s/o 195th St.	Non-Sensitive	68.6	RW	116	250
9	Western Av.	n/o Del Amo Blvd.	Sensitive	68.8	56	120	258
10	Western Av.	s/o Del Amo Blvd.	Sensitive	67.9	RW	105	227
11	190th St.	w/o Van Ness Av.	Non-Sensitive	69.4	61	131	283
12	190th St.	e/o Van Ness Av.	Sensitive	69.2	59	127	273
13	190th St.	w/o Western Av.	Non-Sensitive	69.1	58	126	271
14	195th St.	w/o Gramercy Pl.	Non-Sensitive	51.4	RW	RW	RW
15	Del Amo Blvd.	w/o Van Ness Av.	Sensitive	64.5	RW	56	122

[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 the receiving adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-4: OPENING YEAR 2023 WITH PROJECT CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Van Ness Av.	n/o 190th St.	Sensitive	66.1	RW	60	128
2	Van Ness Av.	s/o 190th St.	Non-Sensitive	65.8	RW	57	122
3	Van Ness Av.	s/o 195th St.	Sensitive	66.0	RW	58	125
4	Van Ness Av.	s/o Del Amo Blvd.	Non-Sensitive	65.0	RW	RW	108
5	Western Av.	n/o I-405 NB Ramp	Non-Sensitive	67.7	RW	102	219
6	Western Av.	n/o 190th St.	Non-Sensitive	69.4	61	132	285
7	Western Av.	s/o 190th St.	Non-Sensitive	69.2	59	128	275
8	Western Av.	s/o 195th St.	Non-Sensitive	68.9	56	121	261
9	Western Av.	n/o Del Amo Blvd.	Sensitive	69.1	58	125	269
10	Western Av.	s/o Del Amo Blvd.	Sensitive	68.3	RW	111	238
11	190th St.	w/o Van Ness Av.	Non-Sensitive	69.8	65	140	301
12	190th St.	e/o Van Ness Av.	Sensitive	69.7	64	137	295
13	190th St.	w/o Western Av.	Non-Sensitive	69.5	62	133	288
14	195th St.	w/o Gramercy Pl.	Non-Sensitive	60.5	RW	RW	43
15	Del Amo Blvd.	w/o Van Ness Av.	Sensitive	64.8	RW	59	128

[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 the receiving adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

7.2 EXISTING PROJECT TRAFFIC NOISE LEVEL INCREASES

An analysis of existing traffic noise levels plus traffic noise generated by the proposed Project has been included in this report for informational purposes and to fully analyze all the existing traffic scenarios identified in the Traffic Study. However, the analysis of existing off-site traffic noise levels plus traffic noise generated by the proposed Project scenario will not actually occur since the Project would not be fully constructed and operational until 2023 conditions. Table 7-1 shows the Existing without Project conditions CNEL noise levels. The Existing without Project exterior noise levels range from 51.4 to 69.3 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-2 shows the Existing with Project conditions ranging from 60.5 to 69.7 dBA CNEL. Table 7-5 shows that the Project off-site traffic noise level increases range from 0.3 to 9.1 dBA CNEL on the study area roadway segments.

Based on the significance criteria for off-site traffic noise presented in Section 4.1, land uses adjacent to the study area roadway segments would experience *less than significant* noise level impacts due to unmitigated Project-related traffic noise levels. For an off-site traffic noise level impact to be considered significant, receivers need to perceive an increase of traffic noise levels over time. Therefore, off-site traffic impacts are generally limited to noise sensitive residential receivers that are likely to perceive this increase over time. While the analysis shows that the

non-sensitive industrial uses will experience an off-site traffic noise level increase of 9.1 dBA CNEL, this is not considered a significant noise level impact since there are no adjacent receivers that will experience this increase over time. In addition, the Project-related off-site traffic noise level increase are largely due to the low traffic volumes that currently exist.

7.3 2023 TRAFFIC NOISE LEVEL INCREASES

Table 7-3 presents the 2023 without Project conditions CNEL noise levels. The 2023 without Project exterior noise levels range from 51.4 to 69.4 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-4 shows that the 2023 with Project conditions will range from 60.5 to 69.8 dBA CNEL. Table 7-6 shows that the Project off-site traffic noise level increases range from 0.3 to 9.1 dBA CNEL on the study area roadway segments.

Based on the significance criteria for off-site traffic noise presented in Section 4.1, land uses adjacent to the study area roadway segments would experience *less than significant* noise level impacts due to unmitigated Project-related traffic noise levels. For an off-site traffic noise level impact to be considered significant, receivers need to perceive an increase of traffic noise levels over time. Therefore, off-site traffic impacts are generally limited to noise sensitive residential receivers that are likely to perceive this increase over time. While the analysis shows that the non-sensitive industrial uses will experience an off-site traffic noise level increase of 9.1 dBA CNEL, this is not considered a significant noise level impact since there are no adjacent receivers that will experience this increase over time. In addition, the Project-related off-site traffic noise level increase are largely due to the low traffic volumes that currently exist.

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

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[1]			Incremental Noise Level Increase Threshold[2]	
				No Project	With Project	Project Addition	Limit	Exceeded?
1	Van Ness Av.	n/o 190th St.	Sensitive	65.4	66.1	0.7	1.5	No
2	Van Ness Av.	s/o 190th St.	Non-Sensitive	65.2	65.8	0.6	n/a	No
3	Van Ness Av.	s/o 195th St.	Sensitive	65.2	65.9	0.7	1.5	No
4	Van Ness Av.	s/o Del Amo Blvd.	Non-Sensitive	64.6	65.0	0.4	n/a	No
5	Western Av.	n/o I-405 NB Ramp	Non-Sensitive	67.3	67.7	0.4	n/a	No
6	Western Av.	n/o 190th St.	Non-Sensitive	68.6	69.4	0.8	n/a	No
7	Western Av.	s/o 190th St.	Non-Sensitive	68.5	69.2	0.7	n/a	No
8	Western Av.	s/o 195th St.	Non-Sensitive	68.5	68.8	0.3	n/a	No
9	Western Av.	n/o Del Amo Blvd.	Sensitive	68.7	69.0	0.3	1.5	No
10	Western Av.	s/o Del Amo Blvd.	Sensitive	67.9	68.2	0.3	1.5	No
11	190th St.	w/o Van Ness Av.	Non-Sensitive	69.3	69.7	0.4	n/a	No
12	190th St.	e/o Van Ness Av.	Sensitive	69.1	69.6	0.5	1.5	No
13	190th St.	w/o Western Av.	Non-Sensitive	69.1	69.5	0.4	n/a	No
14	195th St.	w/o Gramercy Pl.	Non-Sensitive	51.4	60.5	9.1	n/a	No
15	Del Amo Blvd.	w/o Van Ness Av.	Sensitive	64.4	64.8	0.4	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)?

TABLE 7-6: 2023 WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[1]			Incremental Noise Level Increase Threshold[2]	
				No Project	With Project	Project Addition	Limit	Exceeded?
1	Van Ness Av.	n/o 190th St.	Sensitive	65.5	66.1	0.6	1.5	No
2	Van Ness Av.	s/o 190th St.	Non-Sensitive	65.3	65.8	0.5	n/a	No
3	Van Ness Av.	s/o 195th St.	Sensitive	65.3	66.0	0.7	1.5	No
4	Van Ness Av.	s/o Del Amo Blvd.	Non-Sensitive	64.6	65.0	0.4	n/a	No
5	Western Av.	n/o I-405 NB Ramp	Non-Sensitive	67.4	67.7	0.3	n/a	No
6	Western Av.	n/o 190th St.	Non-Sensitive	68.6	69.4	0.8	n/a	No
7	Western Av.	s/o 190th St.	Non-Sensitive	68.5	69.2	0.7	n/a	No
8	Western Av.	s/o 195th St.	Non-Sensitive	68.6	68.9	0.3	n/a	No
9	Western Av.	n/o Del Amo Blvd.	Sensitive	68.8	69.1	0.3	1.5	No
10	Western Av.	s/o Del Amo Blvd.	Sensitive	67.9	68.3	0.4	1.5	No
11	190th St.	w/o Van Ness Av.	Non-Sensitive	69.4	69.8	0.4	n/a	No
12	190th St.	e/o Van Ness Av.	Sensitive	69.2	69.7	0.5	1.5	No
13	190th St.	w/o Western Av.	Non-Sensitive	69.1	69.5	0.4	n/a	No
14	195th St.	w/o Gramercy Pl.	Non-Sensitive	51.4	60.5	9.1	n/a	No
15	Del Amo Blvd.	w/o Van Ness Av.	Sensitive	64.5	64.8	0.3	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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8 SENSITIVE RECEIVER LOCATIONS

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

To describe the potential off-site Project noise levels, six sensitive 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 proposed noise sensitive residence at 18931 Haas Avenue, approximately 929 feet northwest of the Project site. Since there are no private outdoor living areas (backyards) facing the Project site, receiver R1 is placed at the building façade. A 24-hour noise measurement was taken near this location, L1, to describe the existing ambient noise environment.

R2: Location R2 represents the existing noise sensitive residence at 18932 Wilton Place, approximately 451 feet northwest of the Project site. Receiver R2 is placed in the outdoor living area (private backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L2, to describe the existing ambient noise environment.

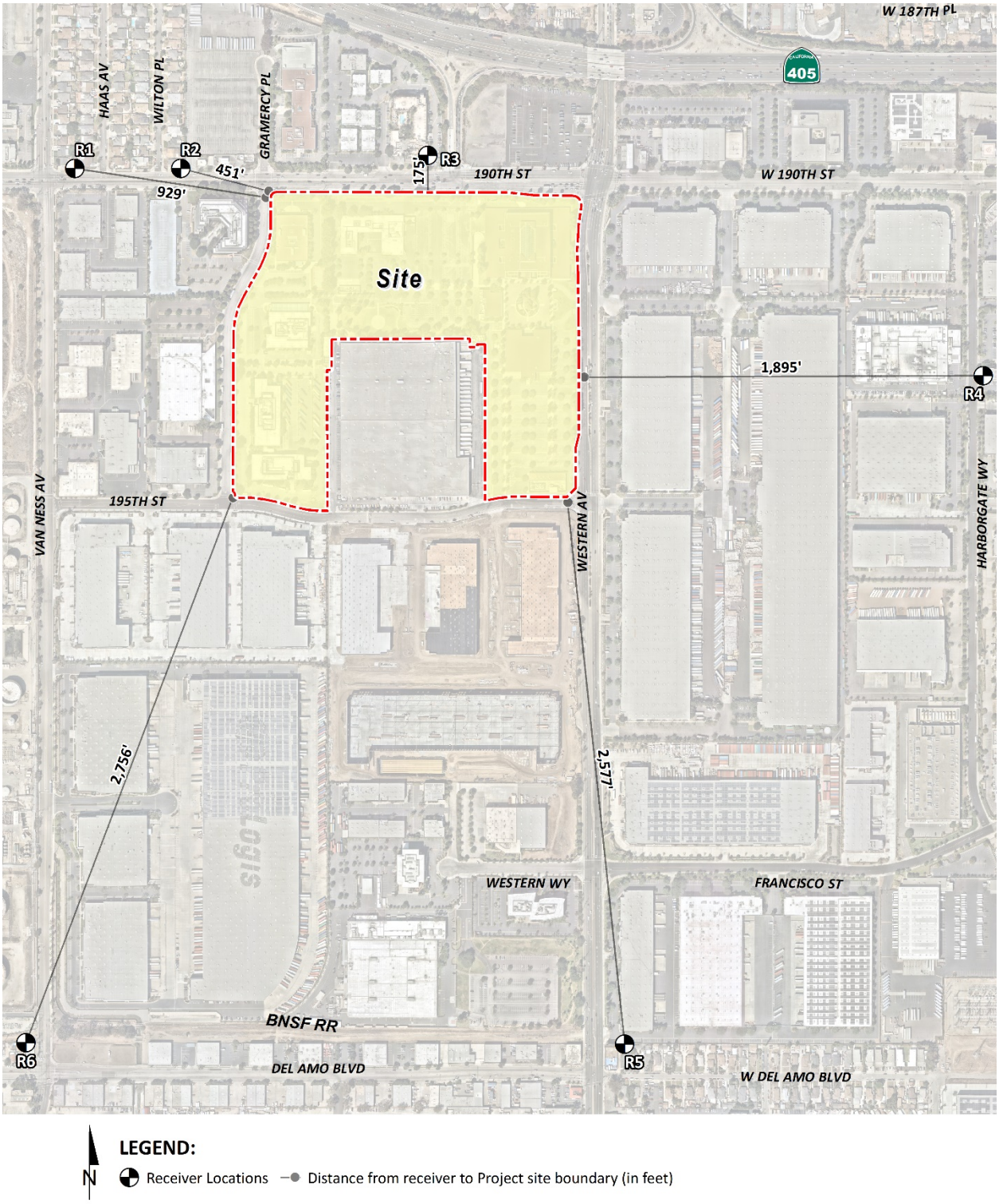
R3: Location R3 represents the proposed noise sensitive Sonesta Select Los Angeles Torrance at 1925 West 190th Street, approximately 175 feet north of the Project site. Since there are no private outdoor living areas (backyards) facing the Project site, receiver R3 is placed at the building façade. A 24-hour noise measurement was taken near this location, L3, to describe the existing ambient noise environment.

R4: Location R4 represents the proposed noise sensitive Extended Stay America - Los Angeles Torrance Harbor at 19200 Harborgate Way, approximately 1,895 feet east of the Project site. Since there are no private outdoor living areas (backyards) facing the Project site, receiver R4 is placed at the building façade. A 24-hour noise measurement was taken near this location, L4, to describe the existing ambient noise environment.

R5: Location R5 represents the existing noise sensitive residence at 1663 Del Amo Boulevard, approximately 2,577 feet southeast of the Project site. Receiver R5 is placed at the private outdoor living areas (backyards) facing the Project site. A 24-hour noise measurement was taken, L5, to describe the existing ambient noise environment.

R6: Location R6 represents the proposed noise sensitive residence at 2057 Del Amo Boulevard, approximately 2,756 feet southwest of the Project site. Receiver R6 is placed in the outdoor living area (private backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L5, to describe the existing ambient noise environment.

EXHIBIT 8-A: RECEIVER LOCATIONS



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9 OPERATIONAL NOISE IMPACTS

This section analyzes the potential stationary-source operational noise impacts at the nearest receiver locations, identified in Section 8, resulting from the operation of the proposed Torrance Commerce Center Phase 3 Project. Exhibit 9-A identifies the noise source locations used to assess the operational noise levels.

9.1 OPERATIONAL NOISE SOURCES

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

9.2 REFERENCE NOISE LEVELS

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

9.2.1 MEASUREMENT PROCEDURES

The reference noise level measurements presented in this section were collected using Piccolo Type 2 integrating sound level meter and dataloggers. The Piccolo sound level meters were calibrated using a Larson-Davis calibrator, Model CAL 150. All noise meters were programmed in "slow" mode to record noise levels in "A" weighted form. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (16)

EXHIBIT 9-A: OPERATIONAL NOISE SOURCE LOCATIONS

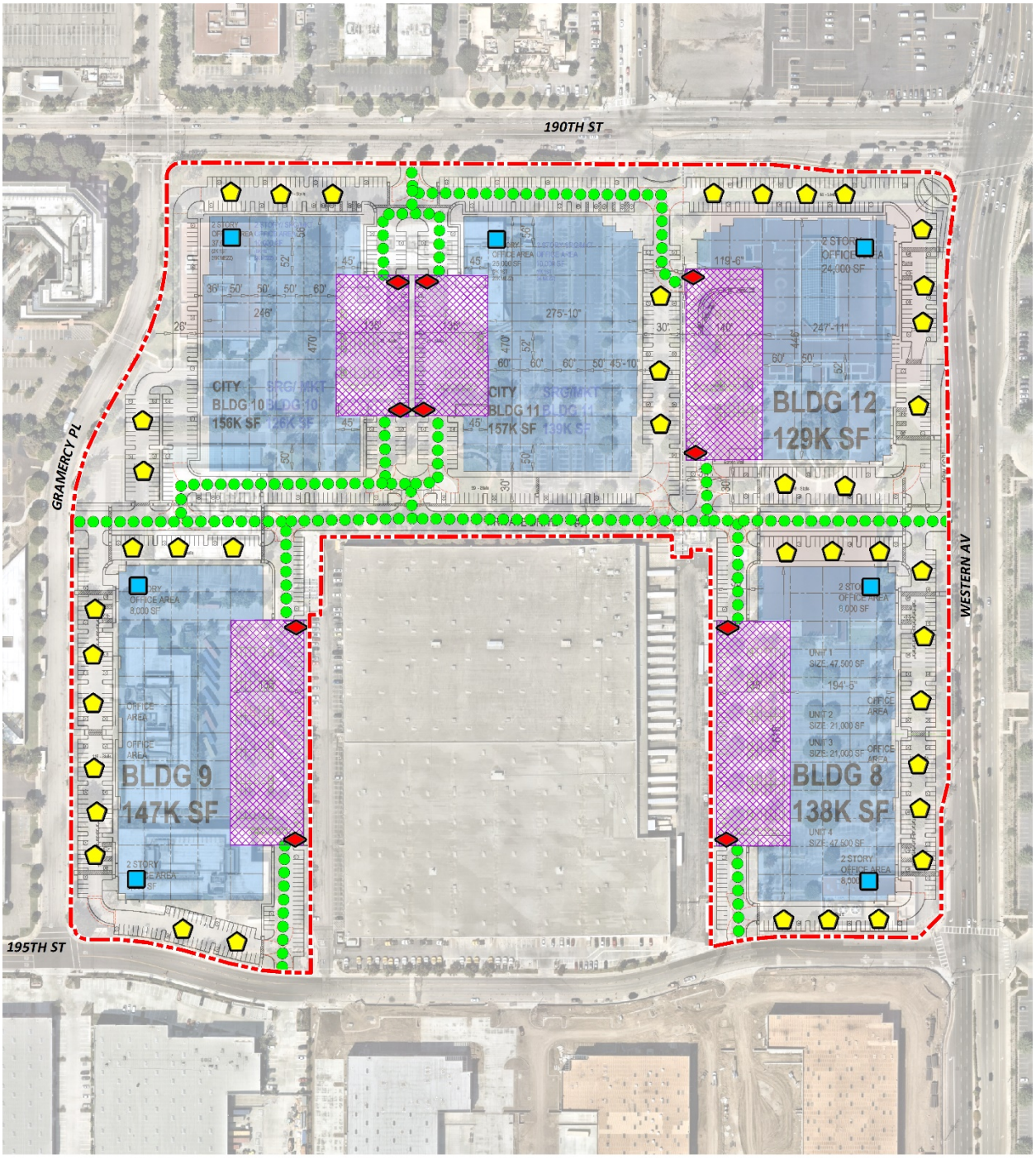


TABLE 9-1: REFERENCE NOISE LEVEL MEASUREMENTS

Noise Source[1]	Noise Source Height (Feet)	Min./ Hour[2]		Reference Noise Level (dBA L_{eq}) @ 50 Feet	Sound Power Level (dBA)[3]
		Day	Night		
Loading Dock Activity	8'	60	60	62.8	103.4
Roof-Top Air Conditioning Units	5'	39	28	57.2	88.9
Trash Enclosure Activity	5'	10	10	57.3	89.0
Parking Lot Vehicle Movements	5'	60	60	56.1	87.8
Truck Movements	8'	60	60	58.0	93.2

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

9.2.2 LOADING DOCK ACTIVITY

The reference loading dock activities are intended to describe the typical operational noise source levels associated with the Project. This includes truck idling, deliveries, backup alarms, unloading/loading, docking including a combination of tractor trailer semi-trucks, two-axle delivery trucks, and background forklift operations. At a uniform reference distance of 50 feet, Urban Crossroads collected a reference noise level of 62.8 dBA L_{eq}. The loading dock activity noise level measurement was taken over a fifteen-minute period and represents multiple noise sources taken from the center of activity. The reference noise level measurement includes employees unloading a docked truck container included the squeaking of the truck's shocks when weight was removed from the truck, employees playing music over a radio, as well as a forklift horn and backup alarm. In addition, during the noise level measurement a truck entered the loading dock area and proceeded to reverse and dock in a nearby loading bay, adding truck engine, idling, air brakes noise, in addition to on-going idling of an already docked truck.

9.2.3 ROOF-TOP AIR CONDITIONING UNITS

The noise level measurements describe a single mechanical roof-top air conditioning unit. The reference noise level represents a Lennox SCA120 series 10-ton model packaged air conditioning unit. At the uniform reference distance of 50 feet, the reference noise levels are 57.2 dBA L_{eq}. Based on the typical operating conditions observed over a four-day measurement period, the roof-top air conditioning units are estimated to operate for and average 39 minutes per hour during the daytime hours, and 28 minutes per hour during the nighttime hours. These operating conditions reflect peak summer cooling requirements with measured temperatures approaching 96 degrees Fahrenheit (°F) with average daytime temperatures of 82°F. For this noise analysis, the air conditioning units are expected to be located on the roof of the Project buildings.

9.2.4 TRASH ENCLOSURE ACTIVITY

To describe the noise levels associated with a trash enclosure activity, Urban Crossroads collected a reference noise level measurement at an existing trash enclosure containing two dumpster bins. The trash enclosure noise levels describe metal gates opening and closing, metal scraping against concrete floor sounds, dumpster movement on metal wheels, and trash dropping into the metal dumpster. The reference noise levels describe trash enclosure noise activities when trash is dropped into an empty metal dumpster, as would occur at the Project Site. The measured reference noise level at the uniform 50-foot reference distance is 57.3 dBA L_{eq} for the trash enclosure activity. The reference noise level describes the expected noise source activities associated with the trash enclosures for the Project's proposed building. Typical trash enclosure activities are estimated to occur for 10 minutes per hour.

9.2.5 PARKING LOT VEHICLE MOVEMENTS

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

9.2.6 TRUCK MOVEMENTS

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

9.3 CADNAA NOISE PREDICTION MODEL

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

Using the ISO 9613-2 protocol, CadnaA will calculate the distance from each noise source to the noise receiver locations, using the ground absorption, distance, and barrier/building attenuation inputs to provide a summary of noise level at each receiver and the partial noise level contributions by noise source. Consistent with the ISO 9613-2 protocol, the CadnaA noise prediction model relies on the reference sound power level (L_w) to describe individual noise sources. While sound pressure levels (e.g., L_{eq}) quantify in decibels the intensity of given sound sources at a reference distance, sound power levels (L_w) are connected to the sound source and are independent of distance. Sound pressure levels vary substantially with distance from the source and diminish because of intervening obstacles and barriers, air absorption, wind, and

other factors. Sound power is the acoustical energy emitted by the sound source and is an absolute value that is not affected by the environment.

The operational noise level calculations provided in this noise study account for the distance attenuation provided due to geometric spreading, when sound from a localized stationary source (i.e., a point source) propagates uniformly outward in a spherical pattern. A default ground attenuation factor of 0.5 was used in the CadnaA noise analysis to account for mixed ground representing a combination of hard and soft surfaces. Appendix 9.1 includes the detailed noise model inputs used to estimate the Project operational noise levels presented in this section.

9.4 PROJECT OPERATIONAL NOISE LEVELS

Using the reference noise levels to represent the proposed Project operations that include loading dock activity, roof-top air conditioning units, trash enclosure activity, parking lot vehicle movements, and truck movements, Urban Crossroads, Inc. calculated the operational source noise levels that are expected to be generated at the Project site and the Project-related noise level increases that would be experienced at each of the sensitive receiver locations. Table 9-2 shows 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 34.4 to 49.9 dBA L_{eq}.

TABLE 9-2: DAYTIME PROJECT OPERATIONAL NOISE LEVELS

Noise Source[1]	Operational Noise Levels by Receiver Location (dBA Leq)					
	R1	R2	R3	R4	R5	R6
Loading Dock Activity	30.8	30.6	47.0	28.2	34.1	32.2
Roof-Top Air Conditioning Units	27.7	29.7	32.8	23.0	20.6	19.8
Trash Enclosure Activity	12.6	11.8	29.6	12.3	15.5	13.6
Parking Lot Vehicle Movements	35.2	38.4	39.9	31.5	26.8	25.8
Truck Movements	35.1	37.7	45.4	31.1	29.8	27.8
Total (All Noise Sources)	**39.2**	**41.7**	**49.9**	**35.5**	**36.2**	**34.4**

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

Tables 9-3 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 34.0 to 49.4 dBA L_{eq}. The differences between the daytime and nighttime noise levels are largely related to the estimated duration of noise activity as outlined in Table 9-1 and Appendix 9.1.

TABLE 9-3: NIGHTTIME PROJECT OPERATIONAL NOISE LEVELS

Noise Source[1]	Operational Noise Levels by Receiver Location (dBA Leq)					
	R1	R2	R3	R4	R5	R6
Loading Dock Activity	30.8	30.6	47.0	28.2	34.1	32.2
Roof-Top Air Conditioning Units	25.3	27.3	30.4	20.6	18.2	17.4
Trash Enclosure Activity	11.6	10.8	28.6	11.3	14.5	12.6
Parking Lot Vehicle Movements	34.3	37.4	38.9	30.5	25.8	24.8
Truck Movements	34.1	36.7	44.4	30.2	28.9	26.9
Total (All Noise Sources)	**38.3**	**40.7**	**49.4**	**34.7**	**35.8**	**34.0**

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

9.5 PROJECT OPERATIONAL NOISE LEVEL COMPLIANCE

To demonstrate compliance with local noise regulations, the Project-only operational noise levels are evaluated against exterior noise level thresholds based on the City of Torrance exterior noise level standards at nearby noise-sensitive receiver locations. Table 9-4 shows the operational noise levels associated with Torrance Commerce Center Phase 3 Project will satisfy the City of Torrance daytime and nighttime exterior noise level standards. Therefore, the operational noise impacts are considered *less than significant* at the nearby noise-sensitive receiver locations.

TABLE 9-4: OPERATIONAL NOISE LEVEL COMPLIANCE

Receiver Location[1]	Project Operational Noise Levels (dBA Leq)[2]		Noise Level Standards (dBA Leq)[3]		Noise Level Standards Exceeded?[4]	
	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime
R1	39.2	38.3	55	50	No	No
R2	41.7	40.7	55	50	No	No
R3	49.9	49.4	55	50	No	No
R4	35.5	34.7	55	50	No	No
R5	36.2	35.8	55	50	No	No
R6	34.4	34.0	55	50	No	No

[1] See Exhibit 8-A for the receiver locations.
[2] Proposed Project operational noise levels as shown on Tables 9-2 and 9-3.
[3] Exterior noise level standards, as shown on Table 4-1.
[4] Do the estimated Project operational noise source activities exceed the noise level standards?
"Daytime" = 7:00 a.m. - 10:00 p.m.; "Nighttime" = 10:00 p.m. - 7:00 a.m.

9.5 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. (2) Instead, they must be logarithmically added using the following base equation:

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

Where "SPL1," "SPL2," etc. are equal to the sound pressure levels being combined, or in this case, the Project-operational and existing ambient noise levels. The difference between the combined Project and ambient noise levels describes the Project noise level increases to the existing ambient noise environment. Noise levels that would be experienced at receiver locations when Project-source noise is added to the daytime and nighttime ambient conditions are presented on Tables 9-5 and 9-6, respectively. As indicated on Tables 9-5, the Project will generate a daytime operational noise level increases ranging from 0.0 to 0.2 dBA L_{eq} at the nearest receiver locations. Table 9-6 shows that the Project will generate a nighttime operational noise level increases ranging from 0.0 to 0.3 dBA L_{eq} at the nearest receiver locations. Project-related operational noise level increases will satisfy the operational noise level increase significance criteria presented in Table 4-1. Therefore, the increases at the sensitive receiver locations will be *less than significant.*

TABLE 9-5: 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[7]	Increase Criteria Exceeded?
R1	39.2	L1	76.3	76.3	0.0	1.5	No
R2	41.7	L2	74.5	74.5	0.0	1.5	No
R3	49.9	L3	64.4	64.6	0.2	5.0	No
R4	35.5	L4	66.0	66.0	0.0	1.5	No
R5	36.2	L5	66.7	66.7	0.0	1.5	No
R6	34.4	L5	66.7	66.7	0.0	1.5	No

[1] See Exhibit 8-A for the receiver locations.
[2] Total Project daytime operational noise levels as shown on Table 9-2.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed daytime ambient noise levels as shown on Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.
[7] Significance increase criteria as shown on Table 4-1.

TABLE 9-6: 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[7]	Increase Criteria Exceeded?
R1	38.3	L1	71.6	71.6	0.0	1.5	No
R2	40.7	L2	70.6	70.6	0.0	1.5	No
R3	49.4	L3	60.6	60.9	0.3	5.0	No
R4	34.7	L4	57.9	57.9	0.0	5.0	No
R5	35.8	L5	61.5	61.5	0.0	5.0	No
R6	34.0	L5	61.5	61.5	0.0	5.0	No

[1] See Exhibit 8-A for the receiver locations.
[2] Total Project nighttime operational noise levels as shown on Table 9-3.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed nighttime ambient noise levels as shown on Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.
[7] Significance increase criteria as shown on Table 4-1.

10 CONSTRUCTION IMPACTS

This section analyzes potential impacts resulting from the short-term construction activities associated with the development of the Project. Exhibit 10-A shows the construction noise source locations in relation to the nearby sensitive receiver locations previously described in Section 8. Section 46.3.1[a] construction activities are permitted within the hours of 7:30 a.m. to 6:00 p.m. Monday through Friday and 9:00 a.m. to 5:00 p.m. on Saturdays; with no activity allowed on Sundays and holidays. (11)

In addition, since neither the City of Torrance General Plan or County Code establish numeric maximum acceptable construction source noise levels at potentially affected receivers for CEQA analysis purposes, a numerical construction threshold based on Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual is used for analysis of daytime construction impacts. The FTA considers a daytime exterior construction noise level of 80 dBA L_{eq} as a reasonable threshold for noise sensitive residential land use. (8 p. 179)

10.1 CONSTRUCTION NOISE LEVELS

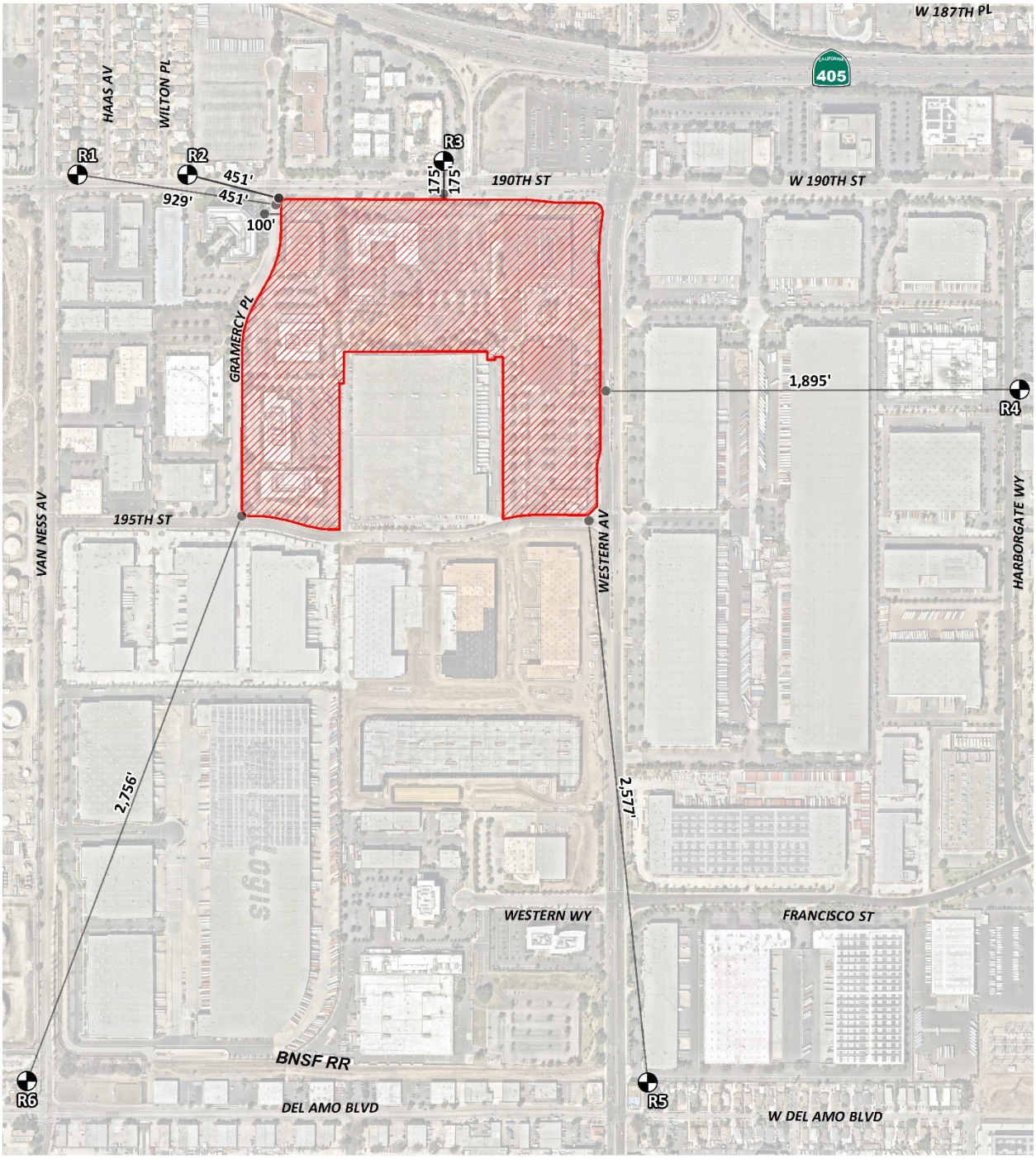
The FTA *Transit Noise and Vibration Impact Assessment Manual* recognizes that construction projects are accomplished in several different stages and outlines the procedures for assessing noise impacts during construction. Each stage has a specific equipment mix, depending on the work to be completed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

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

10.2 CONSTRUCTION REFERENCE NOISE LEVELS

To describe construction noise activities, this construction noise analysis was prepared using reference construction equipment noise levels from the Federal Highway Administration (FHWA) published the Roadway Construction Noise Model (RCNM), which includes a national database of construction equipment reference noise emission levels. (21) The RCNM equipment database, provides a comprehensive list of the noise generating characteristics for specific types of construction equipment. In addition, the database provides an acoustical usage factor to estimate the fraction of time each piece of construction equipment is operating at full power (i.e., its loudest condition) during a construction operation.

EXHIBIT 10-A: TYPICAL CONSTRUCTION NOISE SOURCE LOCATIONS



10.3 CONSTRUCTION NOISE ANALYSIS

Using the reference construction equipment noise levels and the CadnaA noise prediction model, calculations of the Project construction noise level impacts at the nearby sensitive receiver locations were completed. Consistent with FTA guidance for general construction noise assessment, Table 10-1 presents the combined noise levels for the loudest construction equipment, assuming they operate at the same time. As shown on Table 10-2, the construction noise levels are expected to range from 34.6 to 55.9 dBA L_{eq} at the nearby receiver locations. Appendix 10.1 includes the detailed CadnaA construction noise model inputs.

TABLE 10-1: CONSTRUCTION REFERENCE NOISE LEVELS

Construction Stage	Reference Construction Activity	Reference Noise Level @ 50 Feet (dBA L_{eq})[1]	Combined Noise Level (dBA L_{eq})[2]	Combined Sound Power Level (PWL)[3]
Demolition	Demolition Equipment	82	83	115
	Backhoes	74		
	Hauling Trucks	72		
Site Preparation	Crawler Tractors	78	80	112
	Hauling Trucks	72		
	Rubber Tired Dozers	75		
Grading	Graders	81	83	115
	Excavators	77		
	Compactors	76		
Building Construction	Cranes	73	81	113
	Tractors	80		
	Welders	70		
Paving	Pavers	74	83	115
	Paving Equipment	82		
	Rollers	73		
Architectural Coating	Cranes	73	77	109
	Air Compressors	74		
	Generator Sets	70		

[1] FHWA Roadway Construction Noise Model (RCNM).
[2] Represents the combined noise level for all equipment assuming they operate at the same time consistent with FTA Transit Noise and Vibration Impact Assessment guidance.
[3] Sound power level represents the total amount of acoustical energy (noise level) produced by a sound source independent of distance or surroundings. Sound power levels calibrated using the CadnaA noise model at the reference distance to the noise source.

TABLE 10-2: CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})						
	Demolition	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Highest Levels[2]
R1	48.9	45.9	48.9	46.9	48.9	42.9	48.9
R2	52.0	49.0	52.0	50.0	52.0	46.0	52.0
R3	55.9	52.9	55.9	53.9	55.9	49.9	55.9
R4	44.5	41.5	44.5	42.5	44.5	38.5	44.5
R5	41.4	38.4	41.4	39.4	41.4	35.4	41.4
R6	40.6	37.6	40.6	38.6	40.6	34.6	40.6

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

10.4 CONSTRUCTION NOISE LEVEL COMPLIANCE

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

TABLE 10-3: CONSTRUCTION NOISE LEVEL COMPLIANCE

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})		
	Highest Construction Noise Levels[2]	Threshold[3]	Threshold Exceeded?[4]
R1	48.9	80	No
R2	52.0	80	No
R3	55.9	80	No
R4	44.5	80	No
R5	41.4	80	No
R6	40.6	80	No

[1] Noise receiver locations are shown on Exhibit 10-A.
[2] Highest construction noise level calculations based on distance from the construction noise source activity to the nearest receiver locations as shown on Table 10-2.
[3] Construction noise level thresholds as shown on Table 4-1.
[4] Do the estimated Project construction noise levels exceed the construction noise level threshold?

10.5 CONSTRUCTION VIBRATION ANALYSIS

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

TABLE 10-4: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

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

Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual

Table 10-5 presents the expected Project related vibration levels at the nearby receiver locations. At distances ranging from 175 to 2,756 feet from Project construction activities, construction vibration velocity levels are estimated to range from 0.000 to 0.005 in/sec PPV. Based on maximum acceptable continuous vibration threshold of 0.3 PPV (in/sec), the typical Project construction vibration levels will fall below the building damage thresholds at all the noise sensitive receiver locations. Therefore, the Project-related vibration impacts are considered *less than significant* during typical construction activities at the Project site. Moreover, the vibration levels reported at the sensitive receiver locations are unlikely to be sustained during the entire construction period but will occur rather only during the times that heavy construction equipment is operating adjacent to the Project site perimeter.

TABLE 10-5: PROJECT CONSTRUCTION VIBRATION LEVELS

Receiver[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	Jackhammer	Loaded Trucks	Large bulldozer	Highest Vibration Level		
R1	929'	0.000	0.000	0.000	0.000	0.000	0.3	No
R2	451'	0.000	0.000	0.001	0.001	0.001	0.3	No
R3	175'	0.000	0.002	0.004	0.005	0.005	0.3	No
R4	1,895'	0.000	0.000	0.000	0.000	0.000	0.3	No
R5	2,577'	0.000	0.000	0.000	0.000	0.000	0.3	No
R6	2,756'	0.000	0.000	0.000	0.000	0.000	0.3	No

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

11 REFERENCES

1. **State of California.** *California Environmental Quality Act, Appendix G.* 2018.
2. **California Department of Transportation Environmental Program.** *Technical Noise Supplement - A Technical Supplement to the Traffic Noise Analysis Protocol.* Sacramento, CA : s.n., September 2013.
3. **Environmental Protection Agency Office of Noise Abatement and Control.** *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety.* March 1974. EPA/ONAC 550/9/74-004.
4. **U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning, Noise and Air Quality Branch.** *Highway Traffic Noise Analysis and Abatement Policy and Guidance.* December 2011.
5. **U.S. Department of Transportation Federal Highway Administration.** *Highway Noise Barrier Design Handbook.* 2001.
6. **U.S. Department of Transportation, Federal Highway Administration.** *Highway Traffic Noise in the United States, Problem and Response.* April 2000. p. 3.
7. **U.S. Environmental Protection Agency Office of Noise Abatement and Control.** *Noise Effects Handbook-A Desk Reference to Health and Welfare Effects of Noise.* October 1979 (revised July 1981). EPA 550/9/82/106.
8. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment Manual.* September 2018.
9. **Office of Planning and Research.** *State of California General Plan Guidelines.* 2019.
10. **City of Torrance.** *General Plan, Noise Element.* April 2010.
11. —. *Municipal Code, Chapter 6 Noise Regulation.*
12. **California Department of Transportation.** *Transportation and Construction Vibration Guidance Manual.* April 2020.
13. **California Court of Appeal.** *Gray v. County of Madera, F053661.* 167 Cal.App.4th 1099; - Cal.Rptr.3d, October 2008.
14. **Federal Interagency Committee on Noise.** *Federal Agency Review of Selected Airport Noise Analysis Issues.* August 1992.
15. **California Department of Transportation.** *Technical Noise Supplement.* November 2009.
16. **American National Standards Institute (ANSI).** *Specification for Sound Level Meters ANSI S1.4-2014/IEC 61672-1:2013.*
17. **U.S. Department of Transportation, Federal Highway Administration.** *FHWA Highway Traffic Noise Prediction Model.* December 1978. FHWA-RD-77-108.
18. **California Department of Transportation Environmental Program, Office of Environmental Engineering.** *Use of California Vehicle Noise Reference Energy Mean Emission Levels (Calveno REMELs) in FHWA Highway Traffic Noise Prediction.* September 1995. TAN 95-03.
19. **California Department of Transportation.** *Traffic Noise Attenuation as a Function of Ground and Vegetation Final Report.* June 1995. FHWA/CA/TL-95/23.
20. **RK Engineering Group, Inc.** *Torrance Commerce Center Phase 3.* October 2021.

21. **U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning.** *FHWA Roadway Construction Noise Model.* January, 2006.

12 CERTIFICATION

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed Torrance Commerce Center Phase 3 Project. The information contained in this noise study report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (949) 584-3148.

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EDUCATION

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

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

PROFESSIONAL REGISTRATIONS

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

PROFESSIONAL AFFILIATIONS

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

PROFESSIONAL CERTIFICATIONS

Certified Acoustical Consultant – County of San Diego • March, 2018
Certified Acoustical Consultant – County of Orange • February, 2011
FHWA-NHI-142051 Highway Traffic Noise Certificate of Training • February, 2013

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APPENDIX 3.1:

CITY OF TORRANCE MUNICIPAL CODE

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CHAPTER 6

NOISE REGULATION Revised 10/21

ARTICLE 1 - GENERAL PROVISIONS
(Added by O-2170; Amended by O-2211)

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

46.1.2 DEFINITIONS.
(Amended by O-2466)

As used in this Chapter, unless the context otherwise clearly indicates, the words and phrases used in this Chapter are defined as follows:

a) Ambient noise is the all encompassing noise associated with a given environment, being usually a composite of sounds from many sources near and far, without inclusion of intruding noises from isolated identifiable sources.

b) Decibel (db) shall mean a unit of level which denotes the ratio between two (2) quantities which are proportional to power; the number of decibels corresponding to the ratio to two (2) amounts of power is ten (10) times the logarithm to the base ten (10) of this ratio.

c) Emergency work shall mean work made necessary to restore property to a safe condition following a public calamity or work required to protect persons or property from an imminent exposure to danger.

d) Noise level, in decibels, is the A-weighted sound pressure level as measured using the slow dynamic characteristic for sound level meters specified in ASA S1.4-1961, American Standard Specification for General Purpose Sound Level Meters, or latest revision thereof. The reference pressure is twenty (20) micronewtons/square meter (2 x 10-4 microbar).

e) Person shall mean a person, firm, association, copartnership, joint venture, corporation or any entity, public or private in nature.

f) Sound level meter shall mean an instrument including a microphone, an amplifier, an output meter, and frequency weighting networks for the measurement of noise and sound levels in a specified manner as specified in ASA S1.4-1961, American Standard Specification for General Purpose Sound Level Meters, or latest revision thereof.

g) Sound pressure level, in decibels (db) of a sound is twenty (20) times the logarithm to the base ten (10) of the ratio of the pressure of this sound to the reference pressure. For the purpose of this Chapter the reference pressure shall be twenty (20) micronewtons/square meter (2 x 10-4 microbar).

h) Impulsive sound means a short duration sound (such as might be produced by the impact of a drophammer or pile driver) with one (1) second or less duration.

i) Motor vehicles shall include, but not be limited to, minibikes and go carts.

j) Sound amplifying equipment shall mean any machine or device for the amplification of the human voice, music, or any other sound. Sound amplifying equipment shall not include standard automobile radios when used and heard only by the occupants of the vehicle in which the automobile radio is installed. Sound amplifying equipment, as used in this Chapter, shall not include warning devices on authorized emergency vehicles or horns or other warning devices on any vehicle used only for traffic safety purposes.

k) Sound truck shall mean any motor vehicle, or any other vehicle regardless of motive power, whether in motion or stationary, having mounted thereon, or attached thereto, any sound amplifying equipment.

l) Commercial purpose shall mean and include the use, operation or maintenance of any sound amplifying equipment for the purpose of advertising any business or any goods or any services, or for the purpose of attracting the attention of the public to, or advertising for, or soliciting patronage or customers to or for any performance, show, entertainment, exhibition, or event, or for the purpose of demonstrating any such sound equipment.

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

n) Residential land shall mean that land which is utilized for residential purposes or zoned for residential purposes.

o) Residential purpose means any purpose involving routine and relatively permanent use of a building as a dwelling, as opposed to relatively transient uses such as hotels and motels.

p) Day means the time period from 7:00 A.M. to 10:00 P.M.

q) Night means the time period from 10:00 P.M. to 7:00 A.M.

46.1.3 MEASUREMENTS.
Noise levels shall be measured with a sound level meter satisfying the requirements of ASA S1.4-1961, American Standard Specification for General Purpose Sound Level Meters, or latest revision thereof. Noise level of steady or slowly varying sounds shall be measured using the slow dynamic characteristic of the sound level meter and by reading the central tendency of the needle. Noise level of impulse sounds shall be measured using the fast dynamic characteristic of the sound level meter and by reading the maximum indication of the needle.

ARTICLE 2 - SPECIAL NOISE SOURCES Revised 10/21
46.2.1 RADIOS, TELEVISION SETS AND SIMILAR DEVICES.
a) Use Restricted. It shall be unlawful for any person within the City of Torrance to use or operate any radio receiving set, musical instrument, phonograph, television set, or other machine or device for the producing or reproducing of sound at any time in such a manner as to produce noise levels on residential land which would disturb the peace, quiet and comfort of neighboring residents or any reasonable person of normal sensitiveness residing in the area.

b) Prima Facie Violation. Any noise exceeding the ambient noise level at the property line of any residential land (or if a condominium or apartment house, within any adjoining apartment) by more than five (5) decibels shall be deemed to be prima facie evidence of a violation of the provisions of this Section.

46.2.2 HAWKERS AND PEDDLERS.
It shall be unlawful for any person within the City to sell anything by outcry within any area of the City utilized for residential purposes. The provisions of this Section shall not be construed to prohibit the selling by outcry of merchandise, food and beverages at licensed sporting events, parades, fairs, circuses and other similar licensed public entertainment events.

46.2.3 DRUMS.
It shall be unlawful for any person to use any drum or other instrument or device of any kind for the purpose of attracting attention by the creation of noise within the City. This Section shall not apply to any person who is a participant in a school band or duly licensed parade or who has been otherwise duly authorized by the City to engage in such conduct.

46.2.4 SCHOOLS, HOSPITALS AND CHURCHES.
It shall be unlawful for any person to create any noise on any street, sidewalk or public place adjacent to any school, institution of learning or church while the same is in use or adjacent to any hospital, which noise unreasonably interferes with the workings of such institution or which disturbs or unduly annoys patients in the hospital, provided

conspicuous signs are displayed in such streets, sidewalks or public place indicating the presence of a school, church or hospital.

46.2.5 ANIMALS AND FOWL.
No person shall keep or maintain, or permit the keeping of upon any premises owned, occupied or controlled by such person, any animal or fowl otherwise permitted to be kept which, by any sound, cry or behavior shall cause annoyance or discomfort to a reasonable person of normal sensitiveness on any residential land.

46.2.6 MACHINERY, EQUIPMENT, FANS AND AIR CONDITIONING.
It shall be unlawful for any person to operate any machinery, equipment, pump, fan, air conditioning apparatus or similar mechanical device in any manner so as to create any noise which would cause the noise level at the property line of any residential land to exceed the ambient noise level by more than five (5) decibels.

46.2.7 OIL PRODUCTION EQUIPMENT.
(Added by O-2528)

It shall be unlawful for any person to operate, or cause to be operated any oil production equipment in any manner so as to create any noise which would cause the noise level at the nearest property line of any residential land to exceed the ambient noise level by more than five (5) decibels; provided, however, that the aforesaid provisions of this Section shall not apply to oil production equipment being used in the drilling, redrilling, deepening, repair, maintenance or abandonment of an oil well.

46.2.8 TRAIN HORNS AND WHISTLES. Revised 10/21
(Added by O-3894)

It shall be unlawful for any person to operate or sound or cause to be operated or sounded, between the hours of 10:00 p.m. of one day and 7:00 a.m. of the next day, a train horn or train whistle which creates noise in excess of ninety-six (96) dB at any place or point three hundred (300) feet or more distant from along a line normal to the direction of travel of the source of such sound.

ARTICLE 3 - CONSTRUCTION
46.3.1 CONSTRUCTION OF BUILDINGS AND PROJECTS.
(Amended by O-3712)

a) It shall be unlawful for any person within the City of Torrance to operate power construction tools, equipment, or engage in the performance of any outside construction or repair work on buildings, structures, or projects in or adjacent to a residential area involving the creation of noise beyond 50 decibels (db) as measured at property lines, except between the hours of 7:30 A.M. to 6:00 P.M. Monday through Friday and 9:00 A.M. to 5:00 P.M. on Saturdays. Construction shall be prohibited on Sundays and Holidays observed by City Hall. An exception exists between the hours of 10:00 A.M. to 4:00 P.M. for homeowners that reside at the property.

b) The Community Development Director may allow expanded hours and days of construction if unusual circumstances and conditions exist. Such requests must be made in writing and must receive approval by the Director prior to any expansion of the hour and day restrictions listed above.

c) Every construction project requiring Planning Commission review or considered to be a significant remodel as defined by Section 231.1.2, shall be required to post an information board along the front property line that displays the property owner's name and contact number, contractor's name and contact number, a copy of TMC Section 46.3.1, a list of any special conditions, and the Code Enforcement phone number where violations can be reported.

d) Properties zoned as commercial, industrial or within an established redevelopment District, are exempted from the above day and hour restrictions if a minimum buffer of 300 feet is maintained from the subject property's property line to the closest residential property. The Community Development Director, may, however, revoke such exemption for a particular project if the noise level exceeds 50 decibels (db) at the property line of a residential property beyond the 300 linear foot buffer.

e) Heavy construction equipment such as pile drivers, mechanical shovels, derricks, hoists, pneumatic hammers, compressors or similar devices shall not be operated at any time, within or adjacent to a residential area, without first obtaining from the Community Development Director permission to do so. Such request for permission shall include a list and type of equipment to be used, the requested hours and locations of its use, and the applicant shall be required to show that the selection of equipment and construction techniques has been based on minimization of noise within the limitations of such equipment as is commercially available or combinations of such equipment and auxiliary sound barriers. Such permission to operate heavy construction equipment will be revoked if operation of such equipment is not in accordance to approval. No permission shall be required to perform emergency work as defined in Article 1 of this Chapter.

46.3.2 OPERATION OF OIL EQUIPMENT.
(Added by O-2528)

a) It shall be unlawful for any person to operate machinery or power tools for the repair, maintenance or abandonment of oil well equipment on Sundays and legal holidays and, except between the hours of 7:00 A.M. and 8:00 P.M., on any other day; provided, however, that the provisions of this subsection shall not apply to any well, the surface of which is three hundred (300) or more feet from any dwelling.

b) It shall be unlawful for any person to conduct oil drilling or redrilling operations other than circulation of mud, on Sundays and legal holidays and, except between the hours of 7:00 A.M. and 9:00 P.M., on any other day; provided, however, that the provisions of this subsection shall not apply to any well the surface of which is three hundred (300) or more feet from any dwelling.

c) It shall be unlawful for any person to operate machinery or power tools for the repair, maintenance or abandonment of oil well equipment or to conduct oil well drilling or redrilling operations at any time within three hundred (300) feet of any dwelling without first obtaining from the Director of Building and Safety permission to do so. Such request for permission shall include a list and type of equipment to be used, the requested hours and locations of its use. The Director of Building and Safety shall issue such permit only if the applicant demonstrates to the reasonable satisfaction of the Director that the selection of equipment and construction techniques has been based on minimization of noise within the limitations of such equipment as is commercially available or combinations of such equipment and auxiliary sound barriers or acoustical sound blankets as provided in Section 46.3.3. Such permission to operate oil well equipment shall be revoked if such equipment is not operated and construction is not accomplished in accordance with the conditions of approval. No permission shall be required to perform emergency work as defined in Article 1 of this Chapter. The person performing such emergency work shall first notify the occupants of adjacent residences and the Torrance Police Department as to the nature and extent of the work to be performed.

46.3.3 ACOUSTICAL BLANKETS.
(Added by O-2528)

Acoustical blankets shall be made of fibrous glass insulation 1-1/2 inches thick, 0.50 pounds per cubic foot density, 0.63 pounds per square foot weight, .00010 to .00015 fibre diameter (inches) with phenolic binder having a temperature limit of 450 degrees F. sewed between layers of fire retardant vinyl fibre glass cloth, 15-17 ounces per square yard sewed with dacron thread D-92 with stitches not more than six (6) to the inch. The lacing cord shall be flat vinyl coated tape composed of fibrous glass yard braided, heat set and bonded. The tape shall have a 90 pound tensile strength. Grommets shall be No. 4 brass. Provided, however, that there may be substituted for the aforesaid specifications an acoustical blanket which in the opinion of the Director of Building and Safety is equal to sound-proofing ability and fire resistive qualities to the aforesaid specifications.

ARTICLE 4 - VEHICLES
46.4.1 VEHICLE REPAIRS.
It shall be unlawful for any person within the City of Torrance to repair, rebuild or test any motor vehicle at any time in such a manner that a reasonable person of normal sensitiveness located on residential land is caused discomfort or annoyance by reason of the noise produced therefrom.

46.4.2 MOTOR DRIVEN VEHICLES.
It shall be unlawful for any person to operate any motor driven vehicle within the City in such a manner that a reasonable person of normal sensitiveness residing in the area is caused discomfort or annoyance; provided, however, that any such vehicle which is operated upon any public highway, street or right-of-way shall be excluded from the provisions of this Section, provided the provisions of the California Motor Vehicle Code, Sections 23130, 27150 and 27151 are complied with.

ARTICLE 5 - AMPLIFIED SOUND
(Amended by O-3360)

46.5.1 PURPOSE.
The Council enacts the provisions of this Article for the sole purpose of securing and promoting the public health, comfort, safety, and welfare for its citizenry. While recognizing that the use of sound amplifying equipment is protected by the constitutional rights of freedom of speech and assembly, the Council nevertheless feels obligated to reasonably regulate the use of sound amplifying equipment in order to protect the correlative constitutional rights of the citizens of this community to privacy and freedom from public nuisance of loud and unnecessary noise.

46.5.2 APPLICATION REQUIRED.
It shall be unlawful for any person, other than personnel of law enforcement or governmental agencies, to install, use or operate within the City a loudspeaker or sound amplifying equipment in a fixed or movable position or mounted upon any sound truck for the purposes of giving instructions, directions, talks, addresses, lectures or transmitting music to any persons or assemblages of persons in or upon any street, alley, sidewalk, park, place or public property without first filing an application and obtaining a permit therefor as set forth in Division 3 of this Code.

46.5.3 REGULATIONS.
The commercial and noncommercial use of sound amplifying equipment shall be subject to the following regulations:

a) The only sounds permitted shall be either music or human speech, or both.

b) The operation of sound amplifying equipment shall only occur between the hours of 9:00 A.M. and 9:00 P.M. each day except on Sundays and legal holidays. The operation of sound amplifying equipment for noncommercial purposes on Sundays and legal holidays shall only occur between the hours of 10:00 A.M. and 6:00 P.M.

c) No sound emanating from sound amplifying equipment shall exceed fifteen (15) dBA above the ambient as measured at any property line.

d) Notwithstanding the provisions of subsection c) of this Section, sound amplifying equipment shall not be operated within two hundred (200) feet of churches, schools or hospitals.

e) In any event, the volume of sound shall be so controlled that it will not be unreasonably loud, raucous, jarring, disturbing or a nuisance to reasonable persons of normal sensitiveness within the area of audibility.

ARTICLE 6 - POWERED GARDENING EQUIPMENT Revised 10/21
46.6.1 EXCESSIVE NOISE PROHIBITED. Revised 10/21
(Amended by O-3894)

a) It shall be unlawful for any person within the City of Torrance to operate power gardening equipment, including but not limited to leaf blowers, mowers and edgers, or engage in the performance of gardening work with powered equipment in or adjacent to a residential area involving the creation of noise beyond fifty (50) decibels (dB) as measured at property lines, except between the hours of 7:30 a.m. to 6:00 p.m. Monday through Friday and 9:00 a.m. to 5:00 p.m. on Saturdays. Operation of powered gardening equipment shall be prohibited on Sundays and holidays observed by City Hall. An exception exists between the hours of 10:00 a.m. to 4:00 p.m. for homeowners that reside at the property.

b) Properties zoned as commercial, industrial or within an established redevelopment district are exempted from the above day and hour restrictions if a minimum buffer of three hundred (300) feet is maintained from the subject

property's property line to the closest residential property. The Community Development Director may, however, revoke such exemption for a particular property if the noise level exceeds fifty (50) decibels (dB) at the property line of a residential property beyond the three hundred (300) linear foot buffer.

ARTICLE 7 - GENERAL NOISE REGULATIONS

46.7.1 GENERAL NOISE REGULATIONS.

Notwithstanding any other provision of this Chapter and in addition thereto, it shall be unlawful for any person to willfully make or continue, or cause to be made or continued, any loud, unnecessary or unusual noise which disturbs the peace or quiet of any neighborhood or which causes discomfort or annoyance to any reasonable person of normal sensitiveness residing in the area.

46.7.2 NOISE LIMITS.

To provide for methodical enforcement and to give reasonable notice of the performance standards to be met, the foregoing intent is expressed in the following numerical standards. For purposes of this Chapter, the City is divided into regions as set forth in Exhibit A.

a) Noise Limits on Residential Land. It shall be unlawful for any person within the City of Torrance (wherever located) to produce noise in excess of the following levels as received on residential land owned or occupied by another person within the designated regions. In addition to the noise limits stated herein, the noise limits set forth in Sec. 46.7.2.b) shall also be complied with.

1) For noise receivers located on residential land, for measurement positions five hundred (500) feet or more distant from the boundaries of Regions 1 and 2, the following limits apply:

REGION (in which noise receiver is located)	NOISE LEVEL, db	
	Day	Night
3	50	45
4	55	50

2) For noise receivers located on residential land, for positions within five hundred (500) feet from the boundary of Region 1 or 2, the following limits apply:

Five (5) dB above the limits set forth in Section 46.7.2.a) 1 above, or 5 dB above the ambient noise level, whichever is the lower number.

b) Noise Limits at Industrial and Commercial Boundaries:

1) Noise Sources in Region 1: It shall be unlawful for any person in Region 1 to produce noise levels at the boundary of Region 1 in excess of 70 dB during the day or 65 dB during the night.

2) Noise Sources in Region 2: It shall be unlawful for any person in Region 2 to produce noise levels at the boundary of Region 2 in excess of 60 dB during the day or 55 dB during the night.

3) Noise Sources in All Remaining Industrial Use Land: It shall be unlawful for any person on industrial use land outside Region 1 and 2 to produce noise levels at his own property boundary in excess of 60 dB during the day or 55 dB during the night.

4) Noise Sources on All Land Use for Commercial Purposes: It shall be unlawful for any person on land used for commercial purposes to produce noise levels at his own property boundary in excess of 60 dB during the day or 55 dB during the night.

In addition to the noise limits set forth herein (Sec. 46.7.2.b), the noise limits set forth in Sec. 46.7.2.(a) shall also be complied with.

c) Corrections to the Noise Limits: The numerical limits given in Sec. 46.7.2.(a) and (b) shall be adjusted by addition of the following corrections where appropriate.

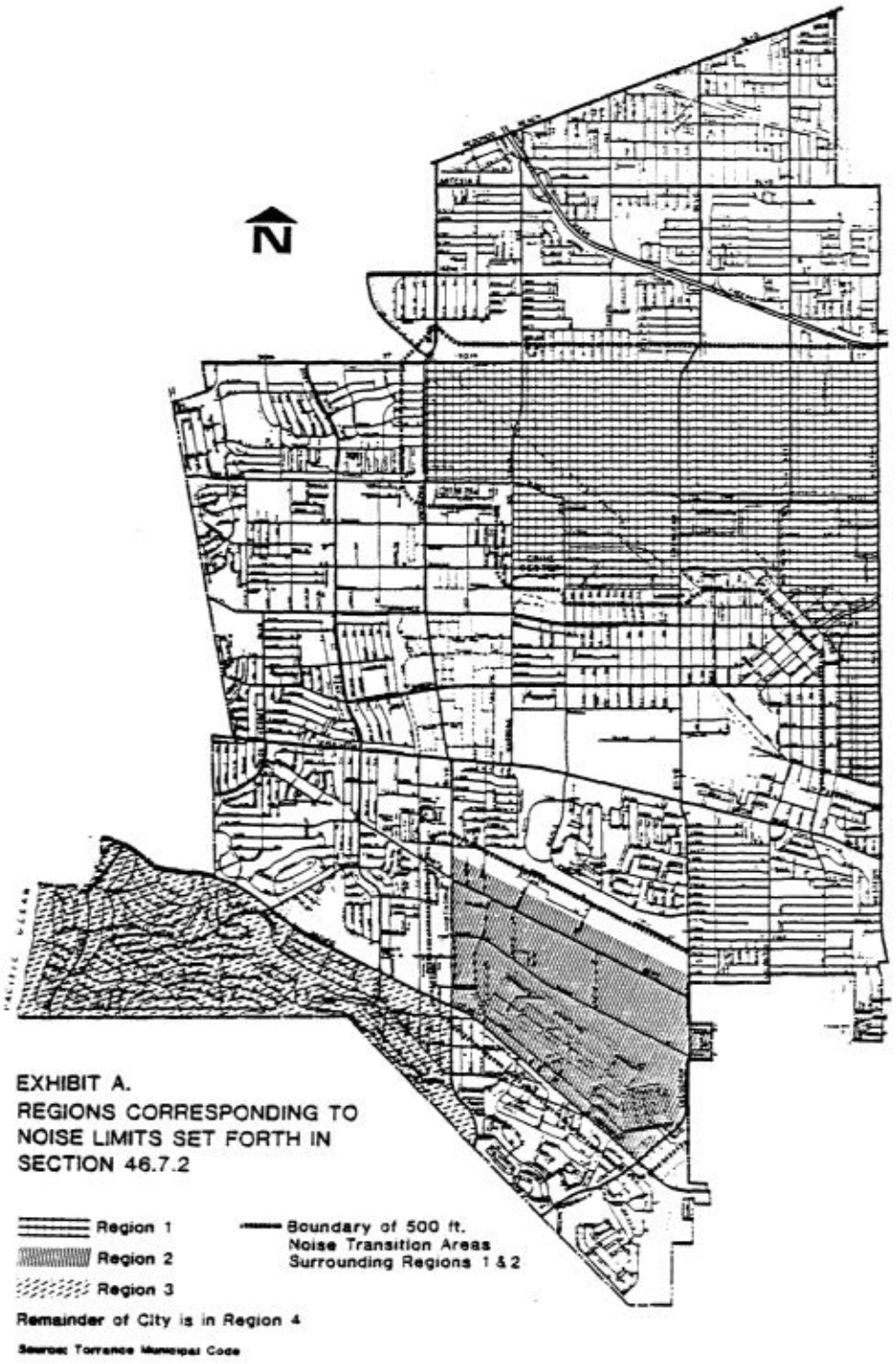
	Noise Conditions		Correction to the Limits, decibels
1.	Noise contains a steady, audible tone, such as a whine, screech or hum		-5
2.	Noise is a repetitive impulsive noise, such as hammering or riveting		-5
3.	If the noise is not continuous, one of the following corrections to the limits shall be applied:		
	a)	Noise occurs less than 5 hours per day or less than 1 hour per night	+5
	b)	Noise occurs less than 90 minutes per day or less than 20 minutes per night	+10
	c)	Noise occurs less than 30 minutes per day or less than 6 minutes per night	+15
4.	Noise occurs on Sunday morning (between 12:01 A.M. and 12:01 P.M. Sunday)		-5

46.7.3 EXCEPTIONS.

The following noise sources are specifically excluded from the provisions of this Chapter:

1) Aircraft in flight.

2) Motor vehicles operating in accordance with Sec. 46.4.2. and in accordance with all the sections of the California Motor Vehicles Code.



ARTICLE 8 - AIRPORT NOISE LIMITS
(Added by O-2784)

46.8.1 VIOLATIONS UNLAWFUL.
It shall be unlawful for any person to pilot or operate or permit to be piloted or operated an aircraft in violation of the provisions of Sections 46.8.8., 46.8.9. or 46.8.14.

46.8.2 EXTENDED AIRPORT BOUNDARIES DEFINED.
For the purposes of this Article, the term extended airport boundaries shall mean the area enclosed by Lomita Boulevard on the north, Crenshaw Boulevard on the east, Pacific Coast Highway on the south and Hawthorne Boulevard on the west.

46.8.3 TAKE-OFF DEFINED.
(Amended by O-3270)

For the purposes of this Article, take-off shall mean the flight of an aircraft departing Torrance Airport from the time it commences on its departure on the runway.

46.8.4 LANDING DEFINED.
(Amended by O-3270)

For the purposes of this Article, landing shall mean the flight of an aircraft from the time it begins its landing approach until it is taxied from the runway.

46.8.5 SOUND EXPOSURE LEVEL.
For the purposes of this Article, the sound exposure level is the level of sound accumulated during a given event, with reference to a duration of one second. More specifically, sound exposure level, in decibels, is the level of the time-integrated A-weighted squared sound pressure for a stated time interval or event, based on the reference pressure of 20 micronewtons per square meter and reference duration of one second.

46.8.6 SENEL.
For the purposes of this Article, the single event noise exposure level (SENEL), in decibels, is the sound exposure level of a single event, such as an aircraft fly-by, measured over the time interval between the initial and final times for which the sound level of a single event exceeds the threshold sound level. For implementation of the provisions of this Article, the threshold noise level shall be at least 20 decibels below the numerical value of the single event noise exposure level limits specified in Sections 46.8.8. or 46.8.9. as the case may be.

46.8.7 MAXIMUM SOUND LEVEL DEFINED.
For the purposes of this Article, the maximum sound level, in decibels, is the highest sound level reached at any instant of time during the time interval used in measuring the sound exposure level of a single event.

46.8.8 AIRCRAFT NOISE LIMIT.
Except as provided in Section 46.8.10., no aircraft taking off from or landing on the Torrance Municipal Airport may exceed a single event noise exposure level (SENEL) of 88 dBA or a maximum sound level of 82 dBA measured at ground level outside the extended Airport boundaries.

46.8.9 AIRCRAFT NOISE LIMIT AT NIGHT.
(Amended by O-3284)

Notwithstanding the provisions of Section 46.8.8., except as provided in Section 46.8.10., no aircraft taking off from or landing on the Torrance Municipal Airport between the hours of 10:00 P.M. of any day and 7:00 A.M. of the following morning on any Monday through Friday inclusive, nor between the hours of 10:00 P.M. each night and 8:00 A.M. of the following morning on any Saturday or Sunday inclusive, nor on any of the following holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day; provided, however, that if any such holiday falls on a Saturday or Sunday, the observance of which is then moved to the preceding Friday, or the following Monday, then such Friday or Monday shall be considered to be a holiday for purposes of this section, may exceed a single event noise exposure level (SENEL) of 82 dBA or a maximum sound level of 76 dBA measured at ground level outside the extended Airport boundaries.

46.8.10 AIRCRAFT NOISE EXEMPTION.
(Amended by O-3382)

The following categories of aircraft shall be exempt from the provisions of Sections 46.8.8. and 46.8.9.:

1) Aircraft operated by the United States of America or the State of California;

2) Law enforcement, emergency, fire or rescue aircraft operated by any county or city of said state;

3) Aircraft used for emergency purposes during an emergency that has been officially proclaimed by competent authority pursuant to the laws of the United States, said State or the City;

4) Civil Air Patrol aircraft when engaged in actual search and rescue missions;

5) Aircraft engaged in landings or takeoffs while conducting tests under the direction of the Airport Manager in an attempt to rebut the presumption of aircraft noise violation pursuant to the provisions of Section 46.8.13

6) Aircraft while participating in a City-sponsored event approved by City Council.

46.8.11 CULPABILITY OF INSTRUCTOR PILOT.
In the case of any training flight in which both an instructor pilot and a student pilot are in the aircraft which is flown in violation of any of the provisions of this Article, the instructor pilot shall be rebuttably presumed to have caused such violation.

46.8.12 CULPABILITY OF AIRCRAFT OWNER OR LESSEE.
For purposes of this Article, the beneficial owner of an aircraft shall be presumed to be the pilot of the aircraft with authority to control the aircraft's operations, except that where the aircraft is leased, the lessee shall be presumed to be the pilot. Such presumption may be rebutted only if the owner or lessee identifies the person who in fact was the pilot at the time of the asserted violation.

46.8.13 DENIAL OF USE OF AIRPORT.
(See Section 51.7.2. et seq. concerning denial of the use of the Airport for repeated violations of this Article.)

46.8.14 PRESUMPTION OF AIRCRAFT NOISE VIOLATION.
In the event that the Airport Manager determines to his reasonable satisfaction that available published noise measurements for a particular type or class of aircraft indicate that it cannot meet the noise levels set forth in Sections 46.8.8. and 46.8.9., it shall be presumed that operation of such aircraft will result in violation of the provisions of Sections 46.8.8. and 46.8.9. and such aircraft will not be permitted to land on, tie down on, be based at or take off from the Torrance Municipal Airport, except in emergencies as set forth in Section 51.4.2.; provided, however, that the owner or operator of such aircraft shall be entitled to rebut such presumption to the reasonable satisfaction of the Airport Manager by furnishing evidence to the contrary.

46.8.15 DESIGNATED ENFORCEMENT OFFICIAL.
The Director of Building and Safety, the Administrator of Environmental Quality, the Environmental Quality Officers and such other City employees as are designated by the Director of Building and Safety with the approval of the City Manager, all acting under the direction and control of the City Manager, shall have the duty and authority to enforce the provisions of this Article, pursuant to the provisions of Section 836.5 of the State Penal Code.

APPENDIX 5.1:

STUDY AREA PHOTOS

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JN: 14092 Study Area Photos

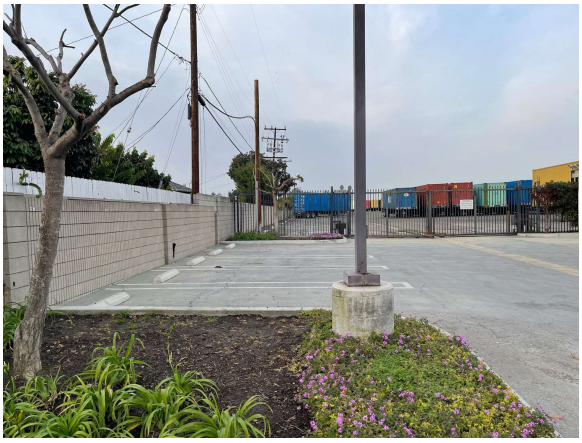
L1_E
33, 51' 30.540000"118, 19' 2.470000"

L1_N
33, 51' 30.560000"118, 19' 2.470000"

L1_S
33, 51' 30.540000"118, 19' 2.470000"

L1_W
33, 51' 30.550000"118, 19' 2.500000"

L2_E
33, 51' 30.520000"118, 18' 56.180000"



L2_N
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JN: 14092 Study Area Photos

L2_S
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L2_W
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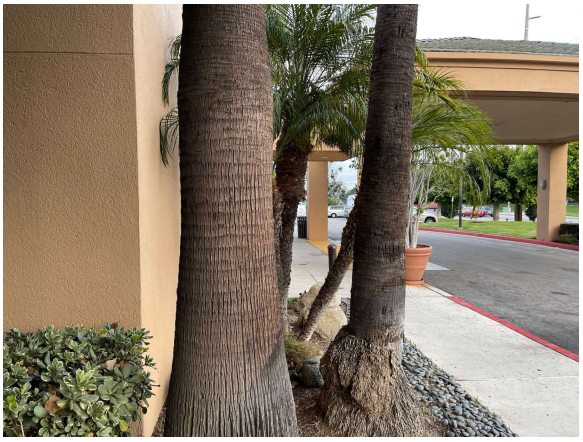

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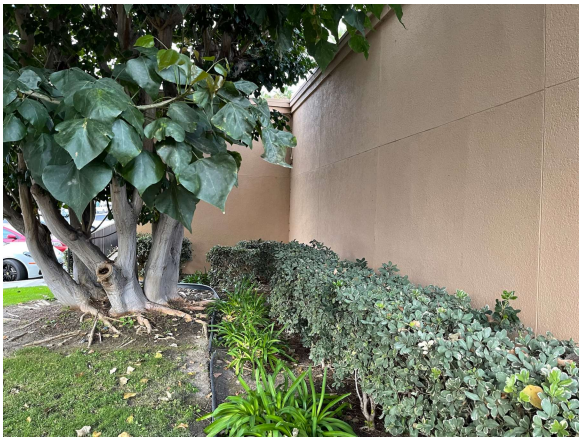

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L3_S
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L3_W
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JN: 14092 Study Area Photos

L4_E
33, 51' 23.220000"118, 18' 12.070000"

L4_N
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L4_S
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L4_W
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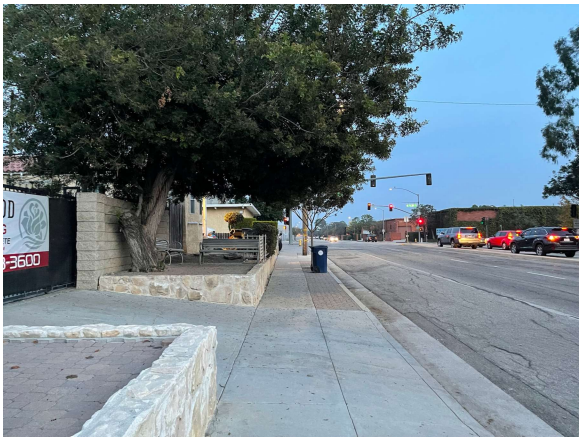

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L5_N
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JN: 14092 Study Area Photos

L5_S
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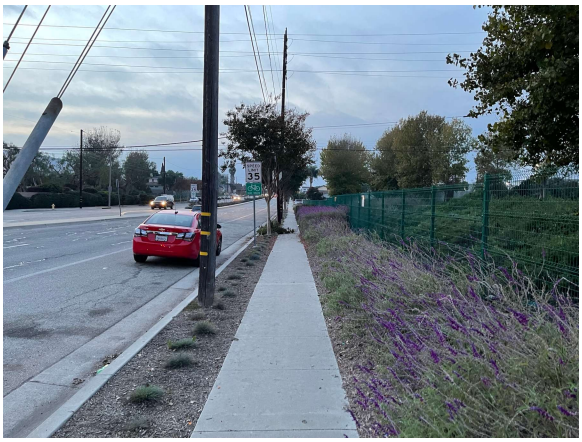

L5_W
33, 50' 49.080000"118, 19' 6.560000"

APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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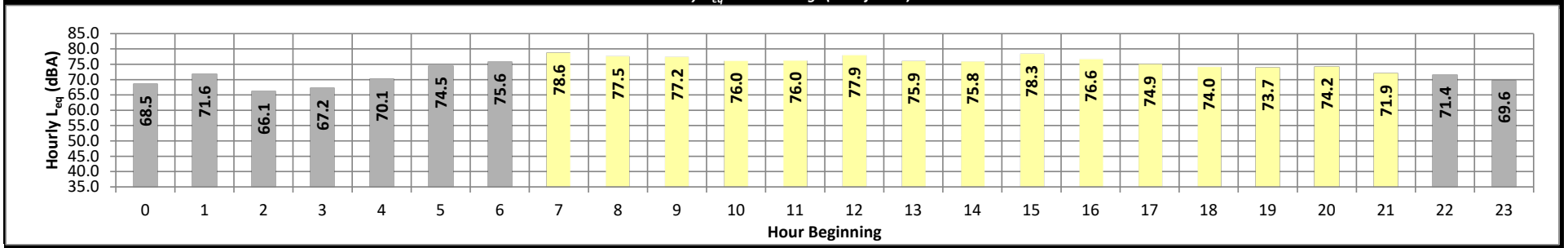
24-Hour Noise Level Measurement Summary

Date: Monday, December 6, 2021 *Location:* L1 - Located northwest of the Project site near single-family *Meter:* Piccolo II *JN:* 14092

Project: Torrance Tech Center *Source:* residence at 18931 Haas Avenue. *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	79.0	54.0	78.6	77.9	75.6	73.8	67.9	62.9	56.0	55.3	54.3	68.5	10.0	78.5
	1	71.6	85.3	51.2	84.7	83.6	79.7	75.9	65.8	59.8	52.7	51.9	51.3	71.6	10.0	81.6
	2	66.1	77.2	51.6	76.8	76.1	73.3	71.4	64.4	59.0	53.3	52.3	51.8	66.1	10.0	76.1
	3	67.2	78.0	52.5	77.7	77.1	74.8	72.9	65.5	59.5	53.6	53.1	52.6	67.2	10.0	77.2
	4	70.1	80.3	56.8	79.8	79.1	76.8	75.3	69.9	65.1	58.3	57.5	57.0	70.1	10.0	80.1
	5	74.5	83.1	63.9	82.7	82.2	80.5	79.3	75.1	71.2	65.2	64.6	64.0	74.5	10.0	84.5
	6	75.6	83.1	64.6	82.8	82.3	81.1	80.2	76.9	73.2	66.4	65.5	64.8	75.6	10.0	85.6
Day	7	78.6	88.6	66.1	88.2	87.3	85.8	83.1	78.6	74.9	67.8	67.0	66.2	78.6	0.0	78.6
	8	77.5	85.2	65.9	84.8	84.3	83.0	82.0	79.0	74.4	67.9	66.9	66.1	77.5	0.0	77.5
	9	77.2	85.8	66.7	85.4	84.7	83.1	81.9	78.0	74.3	68.5	67.7	66.9	77.2	0.0	77.2
	10	76.0	85.2	65.3	84.6	83.9	81.9	80.3	76.6	73.1	67.0	66.1	65.5	76.0	0.0	76.0
	11	76.0	84.3	65.5	83.9	83.2	81.7	80.7	76.8	73.4	68.0	66.9	65.7	76.0	0.0	76.0
	12	77.9	88.1	66.9	87.7	87.1	85.3	83.0	76.9	73.7	68.6	67.8	67.1	77.9	0.0	77.9
	13	75.9	84.2	65.4	83.7	83.2	81.7	80.5	76.5	73.5	67.3	66.3	65.6	75.9	0.0	75.9
	14	75.8	83.9	65.8	83.4	82.7	81.1	80.0	77.0	73.3	67.9	66.7	65.9	75.8	0.0	75.8
	15	78.3	89.7	66.6	89.3	88.2	84.9	82.5	77.4	73.6	68.3	67.5	66.8	78.3	0.0	78.3
	16	76.6	86.9	64.1	86.0	84.8	82.0	80.6	77.0	73.6	66.9	65.4	64.3	76.6	0.0	76.6
	17	74.9	82.6	63.9	82.1	81.7	80.2	79.1	76.2	72.9	65.9	64.9	64.1	74.9	0.0	74.9
	18	74.0	82.0	62.1	81.6	81.0	79.4	78.3	75.2	71.7	64.3	63.2	62.2	74.0	0.0	74.0
	19	73.7	82.5	61.9	82.1	81.5	79.7	78.2	74.3	70.9	63.8	62.8	62.1	73.7	5.0	78.7
	20	74.2	84.5	60.7	83.9	83.1	80.4	78.4	74.4	70.5	63.0	61.7	60.8	74.2	5.0	79.2
	21	71.9	81.3	59.3	80.8	80.2	78.1	76.7	72.3	68.4	61.2	60.1	59.4	71.9	5.0	76.9
Night	22	71.4	81.3	57.9	80.8	80.1	77.7	75.8	71.7	67.8	60.3	59.0	58.1	71.4	10.0	81.4
	23	69.6	79.8	56.0	79.4	78.8	76.2	74.5	69.6	65.1	57.7	56.9	56.1	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	71.9	81.3	59.3	80.8	80.2	78.1	76.7	72.3	68.4	61.2	60.1	59.4
	Max	78.6	89.7	66.9	89.3	88.2	85.8	83.1	79.0	74.9	68.6	67.8	67.1
Energy Average		76.3	Average:		84.5	83.8	81.9	80.4	76.4	72.8	66.4	65.4	64.6
Night	Min	66.1	77.2	51.2	76.8	76.1	73.3	71.4	64.4	59.0	52.7	51.9	51.3
	Max	75.6	85.3	64.6	84.7	83.6	81.1	80.2	76.9	73.2	66.4	65.5	64.8
Energy Average		71.6	Average:		80.4	79.7	77.3	75.5	69.6	64.8	58.2	57.3	56.7

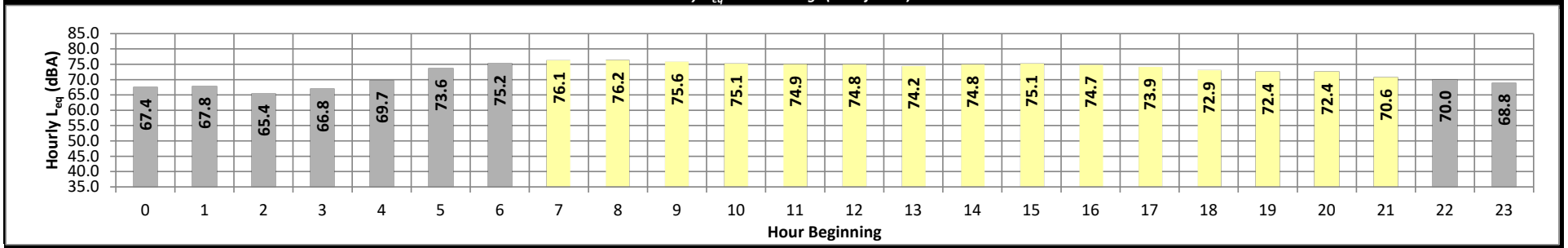
L_{eq} (dBA)		
24-Hour	Daytime (7am-10pm)	Nighttime (10pm-7am)
75.0	**76.3**	**71.6**

24-Hour Noise Level Measurement Summary

Date: Monday, December 6, 2021 *Location:* L2 - Located northwest of the Project site near single-family *Meter:* Piccolo II *JN:* 14092

Project: Torrance Tech Center *Source:* residence at 18932 Wilton Place. *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	67.4	77.7	52.8	77.5	76.9	74.7	72.6	66.8	61.6	54.2	53.6	53.0	67.4	10.0	77.4
	1	67.8	80.6	51.5	80.2	79.4	75.4	72.2	64.1	58.5	52.4	52.0	51.6	67.8	10.0	77.8
	2	65.4	76.5	50.6	76.1	75.6	73.1	70.9	63.7	57.5	51.6	51.1	50.7	65.4	10.0	75.4
	3	66.8	78.0	50.9	77.7	77.1	74.7	72.7	64.5	57.9	51.8	51.3	51.0	66.8	10.0	76.8
	4	69.7	79.4	54.3	79.1	78.4	76.5	75.2	69.8	63.9	55.4	54.8	54.4	69.7	10.0	79.7
	5	73.6	81.9	58.2	81.6	81.1	79.7	78.7	74.9	69.5	60.2	59.0	58.3	73.6	10.0	83.6
	6	75.2	82.5	61.6	82.2	81.7	80.4	79.6	76.8	72.6	64.4	63.3	61.8	75.2	10.0	85.2
Day	7	76.1	82.8	64.4	82.5	82.0	80.7	80.0	77.7	74.8	66.6	65.4	64.6	76.1	0.0	76.1
	8	76.2	82.5	63.9	82.2	81.8	80.8	80.1	77.9	75.0	66.2	65.0	64.2	76.2	0.0	76.2
	9	75.6	83.3	62.9	83.0	82.4	80.9	79.9	77.0	73.4	65.7	64.4	63.3	75.6	0.0	75.6
	10	75.1	83.6	62.5	83.1	82.4	81.1	79.9	76.0	72.0	64.8	63.7	62.6	75.1	0.0	75.1
	11	74.9	82.7	61.8	82.2	81.7	80.3	79.5	76.2	72.1	64.5	63.2	62.1	74.9	0.0	74.9
	12	74.8	83.4	60.7	83.1	82.4	80.3	79.2	75.8	72.1	64.0	62.2	61.1	74.8	0.0	74.8
	13	74.2	81.6	61.2	81.2	80.8	79.5	78.8	75.7	71.9	64.0	62.7	61.3	74.2	0.0	74.2
	14	74.8	82.3	61.4	82.0	81.5	79.9	79.0	76.2	72.5	64.5	62.9	61.6	74.8	0.0	74.8
	15	75.1	82.4	62.3	82.1	81.6	80.2	79.3	76.4	73.1	65.3	63.7	62.5	75.1	0.0	75.1
	16	74.7	82.2	62.4	81.8	81.2	79.6	78.6	75.9	73.1	65.5	64.0	62.7	74.7	0.0	74.7
	17	73.9	80.6	61.6	80.2	79.7	78.5	77.7	75.5	72.4	64.7	63.0	61.9	73.9	0.0	73.9
	18	72.9	80.3	60.2	80.0	79.5	78.2	77.3	74.2	70.9	63.0	61.7	60.5	72.9	0.0	72.9
	19	72.4	80.5	56.4	80.1	79.6	78.2	77.2	73.5	69.3	59.7	58.3	56.8	72.4	5.0	77.4
	20	72.4	82.1	58.2	81.6	80.8	78.5	77.0	72.9	68.7	60.7	59.4	58.3	72.4	5.0	77.4
	21	70.6	79.8	55.6	79.4	78.7	76.6	75.2	71.4	67.3	57.9	56.7	55.8	70.6	5.0	75.6
Night	22	70.0	79.6	55.5	79.2	78.4	76.2	74.5	70.5	66.5	57.8	56.5	55.6	70.0	10.0	80.0
	23	68.8	78.8	54.3	78.5	77.8	75.4	73.9	68.8	64.2	56.0	55.2	54.5	68.8	10.0	78.8

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	70.6	79.8	55.6	79.4	78.7	76.6	75.2	71.4	67.3	57.9	56.7	55.8
	Max	76.2	83.6	64.4	83.1	82.4	81.1	80.1	77.9	75.0	66.6	65.4	64.6
Energy Average		74.5	Average:		81.6	81.1	79.6	78.6	75.5	71.9	63.8	62.4	61.3
Night	Min	65.4	76.5	50.6	76.1	75.6	73.1	70.9	63.7	57.5	51.6	51.1	50.7
	Max	75.2	82.5	61.6	82.2	81.7	80.4	79.6	76.8	72.6	64.4	63.3	61.8
Energy Average		70.6	Average:		79.1	78.5	76.2	74.5	68.9	63.6	56.0	55.2	54.5

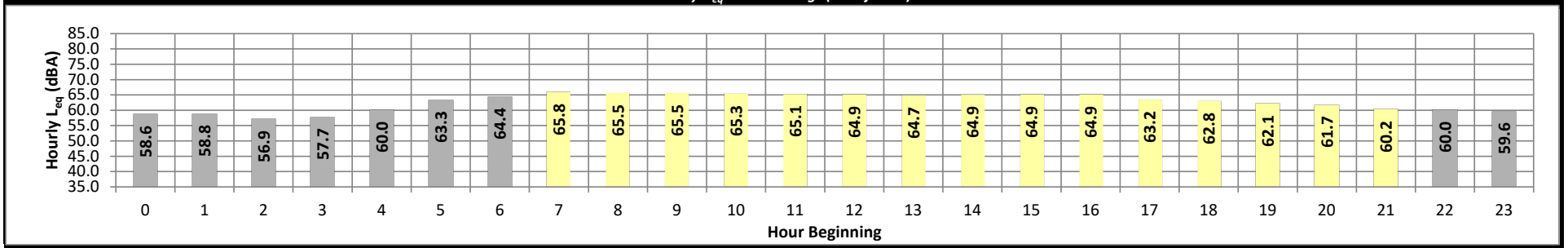
L_{eq} (dBA)		
24-Hour	Daytime (7am-10pm)	Nighttime (10pm-7am)
73.4	**74.5**	**70.6**

24-Hour Noise Level Measurement Summary

Date: Monday, December 6, 2021 *Location:* L3 - Located north of the Project site near Sonesta Select Los *Meter:* Piccolo II *JN:* 14092

Project: Torrance Tech Center *Source:* Angeles Torrance at 1925 West 190th 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	58.6	67.0	52.6	66.7	66.3	64.1	62.9	58.8	55.6	53.2	52.9	52.7	58.6	10.0	68.6
	1	58.8	68.1	53.8	67.7	67.0	64.5	62.7	58.4	56.0	54.1	54.0	53.8	58.8	10.0	68.8
	2	56.9	65.8	51.4	65.5	64.9	62.9	61.3	56.8	53.7	51.9	51.7	51.5	56.9	10.0	66.9
	3	57.7	66.8	52.0	66.5	65.8	63.5	61.9	57.5	54.5	52.5	52.3	52.1	57.7	10.0	67.7
	4	60.0	68.2	53.7	67.9	67.3	65.6	64.4	60.6	57.0	54.2	54.0	53.8	60.0	10.0	70.0
	5	63.3	70.2	56.3	70.0	69.5	68.3	67.4	64.4	61.1	57.0	56.6	56.4	63.3	10.0	73.3
	6	64.4	70.9	57.1	70.6	70.2	69.0	68.3	65.6	62.8	58.1	57.5	57.2	64.4	10.0	74.4
Day	7	65.8	72.7	58.2	72.4	71.9	70.6	69.7	66.8	64.0	59.4	58.7	58.3	65.8	0.0	65.8
	8	65.5	72.1	57.9	71.8	71.4	70.2	69.4	66.6	64.0	59.2	58.5	58.1	65.5	0.0	65.5
	9	65.5	73.9	57.8	73.5	72.8	70.7	69.2	66.2	63.6	59.0	58.4	57.9	65.5	0.0	65.5
	10	65.3	72.0	58.3	71.7	71.2	70.2	69.2	66.2	63.8	59.7	59.1	58.5	65.3	0.0	65.3
	11	65.1	72.0	57.4	71.8	71.4	70.2	69.1	66.0	63.3	59.0	58.2	57.6	65.1	0.0	65.1
	12	64.9	73.5	56.6	72.9	72.3	70.4	68.5	65.6	62.9	58.2	57.5	56.8	64.9	0.0	64.9
	13	64.7	72.5	56.8	72.0	71.4	69.7	68.7	65.7	62.6	58.3	57.6	57.0	64.7	0.0	64.7
	14	64.9	72.1	56.8	71.7	71.1	69.6	68.5	66.1	63.2	58.2	57.5	56.9	64.9	0.0	64.9
	15	64.9	71.7	56.9	71.4	71.1	69.8	69.0	65.9	63.1	58.6	57.7	57.0	64.9	0.0	64.9
	16	64.9	72.0	56.9	71.7	71.3	69.8	68.7	65.9	63.5	58.7	57.9	57.0	64.9	0.0	64.9
	17	63.2	69.4	56.4	69.0	68.5	67.2	66.6	64.5	62.2	57.8	57.1	56.5	63.2	0.0	63.2
	18	62.8	70.0	55.1	69.6	69.1	67.4	66.5	63.7	61.2	56.6	55.9	55.2	62.8	0.0	62.8
	19	62.1	68.2	55.1	67.9	67.6	66.7	66.0	63.2	60.4	56.3	55.7	55.2	62.1	5.0	67.1
	20	61.7	69.4	54.9	69.1	68.5	66.8	65.7	62.3	59.9	55.9	55.3	55.0	61.7	5.0	66.7
	21	60.2	66.7	53.9	66.4	66.0	64.8	63.9	61.2	58.5	54.9	54.3	54.0	60.2	5.0	65.2
Night	22	60.0	67.7	53.6	67.4	66.8	65.0	63.9	60.7	58.0	54.2	53.9	53.6	60.0	10.0	70.0
	23	59.6	66.3	54.8	66.0	65.6	64.5	63.6	60.2	57.9	55.2	55.0	54.8	59.6	10.0	69.6

Timeframe	*Hour*	*L_{eq}*	*L_{max}*	*L_{min}*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	60.2	66.7	53.9	66.4	66.0	64.8	63.9	61.2	58.5	54.9	54.3	54.0
	Max	65.8	73.9	58.3	73.5	72.8	70.7	69.7	66.8	64.0	59.7	59.1	58.5
Energy Average		64.4	Average:		70.9	70.4	68.9	67.9	65.1	62.4	58.0	57.3	56.7
Night	Min	56.9	65.8	51.4	65.5	64.9	62.9	61.3	56.8	53.7	51.9	51.7	51.5
	Max	64.4	70.9	57.1	70.6	70.2	69.0	68.3	65.6	62.8	58.1	57.5	57.2
Energy Average		60.6	Average:		67.6	67.0	65.3	64.0	60.3	57.4	54.5	54.2	54.0

L_{eq} (dBA)

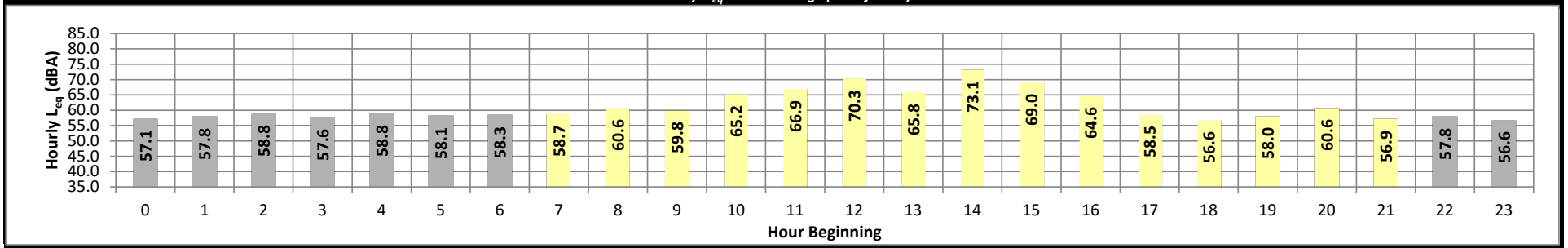
24-Hour	*Daytime (7am-10pm)*	*Nighttime (10pm-7am)*
63.3	**64.4**	**60.6**

24-Hour Noise Level Measurement Summary

Date: Monday, December 6, 2021 *Location:* L4 - Located east of the Project site near Extended Stay America - Los Angeles Torrance Harbor at 19200 Harborgate Way. *Meter:* Piccolo II *JN:* 14092

Project: Torrance Tech Center *Source:* *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	57.1	66.3	52.5	65.9	65.3	63.3	61.3	56.2	53.9	52.9	52.7	52.6	57.1	10.0	67.1
	1	57.8	67.5	53.0	66.9	66.2	64.0	62.3	56.4	54.4	53.4	53.2	53.1	57.8	10.0	67.8
	2	58.8	69.3	52.5	68.8	67.9	65.4	63.6	57.3	54.3	53.0	52.8	52.7	58.8	10.0	68.8
	3	57.6	66.6	53.9	66.1	65.2	62.7	60.8	56.8	55.2	54.4	54.2	54.0	57.6	10.0	67.6
	4	58.8	70.5	53.9	69.4	68.0	64.1	61.3	57.7	56.0	54.4	54.2	54.0	58.8	10.0	68.8
	5	58.1	65.7	54.7	65.2	64.6	62.6	61.4	58.1	56.2	55.1	55.0	54.8	58.1	10.0	68.1
	6	58.3	66.6	54.3	66.0	65.1	63.2	61.9	58.3	56.1	54.7	54.6	54.4	58.3	10.0	68.3
Day	7	58.7	66.1	54.7	65.7	65.0	63.2	62.1	59.1	56.9	55.3	55.1	54.8	58.7	0.0	58.7
	8	60.6	70.2	54.5	69.8	69.1	66.7	64.4	60.3	57.8	55.1	54.8	54.6	60.6	0.0	60.6
	9	59.8	68.5	54.8	68.1	67.5	65.3	63.5	59.8	57.4	55.6	55.2	54.9	59.8	0.0	59.8
	10	65.2	77.0	54.4	77.0	76.8	75.9	70.3	61.3	57.2	54.9	54.7	54.5	65.2	0.0	65.2
	11	66.9	74.6	63.0	73.4	72.5	70.8	69.8	67.1	65.8	64.0	63.6	63.2	66.9	0.0	66.9
	12	70.3	75.8	66.9	74.9	74.2	73.1	72.6	70.9	69.7	67.9	67.6	67.1	70.3	0.0	70.3
	13	65.8	76.7	59.4	75.1	73.5	70.6	69.2	65.7	63.6	60.7	60.1	59.6	65.8	0.0	65.8
	14	73.1	77.4	70.0	76.7	76.2	75.5	75.1	73.9	72.7	71.0	70.7	70.3	73.1	0.0	73.1
	15	69.0	74.1	64.6	73.3	72.6	71.8	71.4	69.9	68.5	65.8	65.2	64.8	69.0	0.0	69.0
	16	64.6	75.2	54.6	74.1	73.0	70.8	69.2	64.2	61.1	57.0	56.0	54.9	64.6	0.0	64.6
	17	58.5	65.7	53.3	65.2	64.7	63.3	62.4	59.2	56.4	54.1	53.8	53.5	58.5	0.0	58.5
	18	56.6	63.8	52.9	63.3	62.8	61.3	60.1	56.7	55.0	53.4	53.2	53.0	56.6	0.0	56.6
	19	58.0	65.4	53.9	65.0	64.5	63.2	62.0	58.0	55.9	54.4	54.2	54.0	58.0	5.0	63.0
	20	60.6	73.0	52.6	72.3	71.3	67.2	64.6	58.0	54.9	53.1	52.9	52.7	60.6	5.0	65.6
	21	56.9	64.6	53.3	64.3	63.7	62.0	60.8	56.7	55.0	53.7	53.6	53.4	56.9	5.0	61.9
Night	22	57.8	67.3	53.7	66.6	65.5	63.1	61.8	57.0	55.2	54.2	54.0	53.8	57.8	10.0	67.8
	23	56.6	65.8	52.7	65.3	64.6	62.4	60.2	55.8	54.0	53.1	52.9	52.8	56.6	10.0	66.6

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	56.6	63.8	52.6	63.3	62.8	61.3	60.1	56.7	54.9	53.1	52.9	52.7
	Max	73.1	77.4	70.0	77.0	76.8	75.9	75.1	73.9	72.7	71.0	70.7	70.3
Energy Average		66.0	Average:		70.5	69.8	68.1	66.5	62.7	60.5	58.4	58.0	57.7
Night	Min	56.6	65.7	52.5	65.2	64.6	62.4	60.2	55.8	53.9	52.9	52.7	52.6
	Max	58.8	70.5	54.7	69.4	68.0	65.4	63.6	58.3	56.2	55.1	55.0	54.8
Energy Average		57.9	Average:		66.7	65.8	63.4	61.6	57.1	55.0	53.9	53.7	53.6

L_{eq} (dBA)

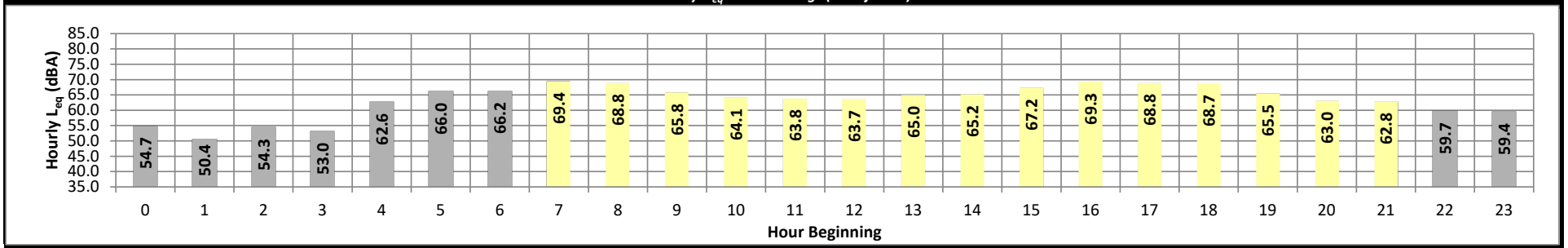
24-Hour	Daytime (7am-10pm)	Nighttime (10pm-7am)
64.4	**66.0**	**57.9**

24-Hour Noise Level Measurement Summary

Date: Monday, December 6, 2021 *Location:* L5 - Located southwest of the Project site near single-family *Meter:* Piccolo II *JN:* 14092

Project: Torrance Tech Center *Source:* residence at 2063 Del Amo Boulevard. *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	54.7	65.7	46.2	65.4	64.9	62.3	59.9	52.3	48.5	46.8	46.6	46.3	54.7	10.0	64.7
	1	50.4	60.3	45.9	60.0	59.5	57.1	54.4	48.6	46.9	46.3	46.2	46.0	50.4	10.0	60.4
	2	54.3	65.8	45.7	65.5	64.9	62.6	59.6	49.9	47.0	46.1	46.0	45.8	54.3	10.0	64.3
	3	53.0	63.7	46.6	63.5	63.0	60.3	57.6	50.7	47.9	47.0	46.9	46.7	53.0	10.0	63.0
	4	62.6	74.8	48.1	74.3	73.7	71.3	68.3	57.9	51.6	48.6	48.4	48.2	62.6	10.0	72.6
	5	66.0	76.0	51.9	75.7	74.9	73.1	71.8	65.9	59.5	53.1	52.4	52.0	66.0	10.0	76.0
	6	66.2	75.8	53.5	75.3	74.7	72.9	71.7	66.4	61.0	55.0	54.2	53.6	66.2	10.0	76.2
Day	7	69.4	78.4	56.0	77.8	77.1	75.4	74.4	70.5	65.8	58.3	57.1	56.2	69.4	0.0	69.4
	8	68.8	77.6	56.1	77.2	76.5	74.7	73.5	70.1	65.2	58.0	57.1	56.2	68.8	0.0	68.8
	9	65.8	74.3	54.4	73.9	73.4	71.8	70.7	66.9	62.1	56.0	55.2	54.6	65.8	0.0	65.8
	10	64.1	73.3	52.3	73.0	72.4	70.6	68.9	64.5	59.8	53.9	53.0	52.5	64.1	0.0	64.1
	11	63.8	72.9	52.4	72.5	72.0	70.1	68.7	64.4	59.8	54.2	53.3	52.6	63.8	0.0	63.8
	12	63.7	72.5	53.2	72.1	71.6	70.1	68.6	64.2	59.9	54.9	54.1	53.5	63.7	0.0	63.7
	13	65.0	74.3	53.4	74.0	73.5	71.8	69.8	65.2	60.9	55.2	54.2	53.6	65.0	0.0	65.0
	14	65.2	74.4	53.4	74.1	73.5	71.5	70.1	65.7	61.1	55.4	54.4	53.6	65.2	0.0	65.2
	15	67.2	77.7	55.0	77.1	76.1	73.6	71.7	67.3	63.1	57.3	56.4	55.2	67.2	0.0	67.2
	16	69.3	77.0	56.7	76.7	76.3	74.8	73.9	70.6	66.6	59.1	58.0	56.9	69.3	0.0	69.3
	17	68.8	76.2	56.6	75.9	75.6	74.4	73.7	70.1	66.0	58.9	57.8	56.8	68.8	0.0	68.8
	18	68.7	80.0	52.9	79.5	78.8	76.0	72.8	68.0	63.0	55.0	53.8	53.1	68.7	0.0	68.7
	19	65.5	76.1	52.8	75.8	75.1	72.5	70.5	64.8	60.0	54.5	53.7	53.0	65.5	5.0	70.5
	20	63.0	73.0	51.7	72.6	71.9	69.9	68.4	62.5	58.3	53.4	52.7	51.9	63.0	5.0	68.0
	21	62.8	74.2	48.6	73.7	73.0	70.4	68.1	61.0	55.6	49.8	49.2	48.8	62.8	5.0	67.8
Night	22	59.7	71.5	47.1	71.1	70.2	67.3	65.0	57.2	51.8	47.8	47.4	47.2	59.7	10.0	69.7
	23	59.4	71.5	46.2	71.1	70.5	67.5	64.4	55.4	49.9	46.7	46.5	46.3	59.4	10.0	69.4

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	62.8	72.5	48.6	72.1	71.6	69.9	68.1	61.0	55.6	49.8	49.2	48.8
	Max	69.4	80.0	56.7	79.5	78.8	76.0	74.4	70.6	66.6	59.1	58.0	56.9
Energy Average		66.7	Average:		75.1	74.5	72.5	70.9	66.4	61.8	55.6	54.7	53.9
Night	Min	50.4	60.3	45.7	60.0	59.5	57.1	54.4	48.6	46.9	46.1	46.0	45.8
	Max	66.2	76.0	53.5	75.7	74.9	73.1	71.8	66.4	61.0	55.0	54.2	53.6
Energy Average		61.5	Average:		69.1	68.5	66.0	63.6	56.0	51.6	48.6	48.3	48.0

L_{eq} (dBA)		
24-Hour	Daytime (7am-10pm)	Nighttime (10pm-7am)
65.4	**66.7**	**61.5**

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APPENDIX 7.1:

OFF-SITE TRAFFIC NOISE LEVEL CALCULATIONS

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

Scenario: E | Project Name: Torrance Commerce
Road Name: Van Ness Av. | Job Number: 14092
Road Segment: n/o 190th St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,250 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,325 vehicles
Vehicle Speed:	35 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%	97.02%
Medium Trucks:	84.8%	4.9%	10.3%	2.36%
Heavy Trucks:	86.5%	2.7%	10.8%	0.62%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	64.30	0.34	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	75.75	-15.79	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-21.60	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:	63.8	61.9	60.1	54.0	62.7	63.3
Medium Trucks:	59.1	57.6	51.2	49.7	58.1	58.4
Heavy Trucks:	59.1	57.7	48.6	49.9	58.2	58.4
Vehicle Noise:	66.0	64.3	60.9	56.5	65.0	65.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	23	50	108	232
CNEL:	25	53	115	248

Monday, December 20, 2021

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

Scenario: E+P | Project Name: Torrance Commerce
Road Name: Van Ness Av. | Job Number: 14092
Road Segment: n/o 190th St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,742 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,374 vehicles
Vehicle Speed:	35 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%	96.66%
Medium Trucks:	84.8%	4.9%	10.3%	2.31%
Heavy Trucks:	86.5%	2.7%	10.8%	1.03%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	64.30	0.49	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	75.75	-15.72	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-19.25	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	62.0	60.2	54.2	62.8	63.4
Medium Trucks:	59.2	57.7	51.3	49.7	58.2	58.4
Heavy Trucks:	61.4	60.0	51.0	52.2	60.6	60.7
Vehicle Noise:	66.7	65.0	61.2	57.2	65.7	66.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	26	56	120	258
CNEL:	27	59	127	275

Monday, December 20, 2021

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

Scenario: OY 2023 | Project Name: Torrance Commerce
Road Name: Van Ness Av. | Job Number: 14092
Road Segment: n/o 190th St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,400 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,340 vehicles
Vehicle Speed:	35 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%	97.02%
Medium Trucks:	84.8%	4.9%	10.3%	2.36%
Heavy Trucks:	86.5%	2.7%	10.8%	0.62%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	64.30	0.39	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	75.75	-15.75	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-21.55	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	61.9	60.1	54.1	62.7	63.3
Medium Trucks:	59.1	57.6	51.3	49.7	58.2	58.4
Heavy Trucks:	59.2	57.7	48.7	49.9	58.3	58.4
Vehicle Noise:	66.1	64.4	60.9	56.5	65.1	65.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	23	50	109	234
CNEL:	25	54	116	250

Monday, December 20, 2021

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

Scenario: OYP 2023 | Project Name: Torrance Commerce
Road Name: Van Ness Av. | Job Number: 14092
Road Segment: n/o 190th St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,892 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,389 vehicles
Vehicle Speed:	35 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%	96.67%
Medium Trucks:	84.8%	4.9%	10.3%	2.31%
Heavy Trucks:	86.5%	2.7%	10.8%	1.02%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	64.30	0.53	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	75.75	-15.68	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-19.23	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	62.0	60.3	54.2	62.9	63.5
Medium Trucks:	59.2	57.7	51.3	49.8	58.3	58.5
Heavy Trucks:	61.5	60.1	51.0	52.3	60.6	60.8
Vehicle Noise:	66.7	65.1	61.2	57.2	65.7	66.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	26	56	121	260
CNEL:	28	60	128	276

Monday, December 20, 2021

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

Scenario: E | Project Name: Torrance Commerce
Road Name: Van Ness Av. | Job Number: 14092
Road Segment: s/o 190th St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,680 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,268 vehicles
Vehicle Speed:	35 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%	97.02%
Medium Trucks:	84.8%	4.9%	10.3%	2.36%
Heavy Trucks:	86.5%	2.7%	10.8%	0.62%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	64.30	0.15	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	75.75	-15.99	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-21.79	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	61.7	59.9	53.8	62.5	63.1
Medium Trucks:	58.9	57.4	51.0	49.5	57.9	58.2
Heavy Trucks:	58.9	57.5	48.5	49.7	58.1	58.2
Vehicle Noise:	65.8	64.1	60.7	56.3	64.8	65.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	23	49	105	226
CNEL:	24	52	112	241

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

Scenario: E+P | Project Name: Torrance Commerce
Road Name: Van Ness Av. | Job Number: 14092
Road Segment: s/o 190th St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,049 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,305 vehicles
Vehicle Speed:	35 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%	96.74%
Medium Trucks:	84.8%	4.9%	10.3%	2.32%
Heavy Trucks:	86.5%	2.7%	10.8%	0.94%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	64.30	0.27	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	75.75	-15.93	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-19.86	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:	63.7	61.8	60.0	54.0	62.6	63.2
Medium Trucks:	59.0	57.4	51.1	49.5	58.0	58.2
Heavy Trucks:	60.8	59.4	50.4	51.6	60.0	60.1
Vehicle Noise:	66.4	64.7	60.9	56.9	65.4	65.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	25	53	114	246
CNEL:	26	56	121	261

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

Scenario: OY 2023 | Project Name: Torrance Commerce
Road Name: Van Ness Av. | Job Number: 14092
Road Segment: s/o 190th St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,820 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,282 vehicles
Vehicle Speed:	35 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%	97.02%
Medium Trucks:	84.8%	4.9%	10.3%	2.36%
Heavy Trucks:	86.5%	2.7%	10.8%	0.62%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	64.30	0.20	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	75.75	-15.94	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-21.74	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	61.7	59.9	53.9	62.5	63.1
Medium Trucks:	58.9	57.4	51.1	49.5	58.0	58.2
Heavy Trucks:	59.0	57.5	48.5	49.8	58.1	58.2
Vehicle Noise:	65.9	64.2	60.7	56.3	64.9	65.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	23	49	105	227
CNEL:	24	52	113	243

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

Scenario: OYP 2023 | Project Name: Torrance Commerce
Road Name: Van Ness Av. | Job Number: 14092
Road Segment: s/o 190th St.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,189 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,319 vehicles
Vehicle Speed:	35 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%	96.74%
Medium Trucks:	84.8%	4.9%	10.3%	2.32%
Heavy Trucks:	86.5%	2.7%	10.8%	0.94%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	64.30	0.31	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	75.75	-15.88	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-19.83	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:	63.7	61.8	60.1	54.0	62.6	63.2
Medium Trucks:	59.0	57.5	51.1	49.6	58.1	58.3
Heavy Trucks:	60.9	59.5	50.4	51.7	60.0	60.2
Vehicle Noise:	66.4	64.7	61.0	56.9	65.4	65.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	25	53	115	247
CNEL:	26	57	122	263

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

Scenario: E
Road Name: Van Ness Av.
Road Segment: s/o 195th St.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,620 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,262 vehicles
Vehicle Speed:	35 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%	97.02%
Medium Trucks:	84.8%	4.9%	10.3%	2.36%
Heavy Trucks:	86.5%	2.7%	10.8%	0.62%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	64.30	0.13	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	75.75	-16.01	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-21.81	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:	63.5	61.6	59.9	53.8	62.4	63.1
Medium Trucks:	58.9	57.4	51.0	49.5	57.9	58.2
Heavy Trucks:	58.9	57.5	48.4	49.7	58.0	58.2
Vehicle Noise:	65.8	64.1	60.7	56.3	64.8	65.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	22	48	104	225
CNEL:	24	52	112	240

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

Scenario: E+P
Road Name: Van Ness Av.
Road Segment: s/o 195th St.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,112 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,311 vehicles
Vehicle Speed:	35 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%	96.64%
Medium Trucks:	84.8%	4.9%	10.3%	2.31%
Heavy Trucks:	86.5%	2.7%	10.8%	1.05%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	64.30	0.28	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	75.75	-15.93	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-19.38	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:	63.7	61.8	60.0	54.0	62.6	63.2
Medium Trucks:	59.0	57.4	51.1	49.5	58.0	58.2
Heavy Trucks:	61.3	59.9	50.9	52.1	60.5	60.6
Vehicle Noise:	66.5	64.8	61.0	57.0	65.5	65.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	25	54	117	251
CNEL:	27	58	124	267

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

Scenario: OY 2023
Road Name: Van Ness Av.
Road Segment: s/o 195th St.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	12,860 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,286 vehicles
Vehicle Speed:	35 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%	97.02%
Medium Trucks:	84.8%	4.9%	10.3%	2.36%
Heavy Trucks:	86.5%	2.7%	10.8%	0.62%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	64.30	0.21	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	75.75	-15.92	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-21.73	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	61.7	60.0	53.9	62.5	63.1
Medium Trucks:	59.0	57.5	51.1	49.5	58.0	58.2
Heavy Trucks:	59.0	57.6	48.5	49.8	58.1	58.2
Vehicle Noise:	65.9	64.2	60.8	56.3	64.9	65.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	23	49	106	228
CNEL:	24	52	113	243

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

Scenario: OYP 2023
Road Name: Van Ness Av.
Road Segment: s/o 195th St.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	13,352 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,335 vehicles
Vehicle Speed:	35 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%	96.65%
Medium Trucks:	84.8%	4.9%	10.3%	2.31%
Heavy Trucks:	86.5%	2.7%	10.8%	1.04%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	64.30	0.36	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	75.75	-15.85	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-19.33	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	61.9	60.1	54.1	62.7	63.3
Medium Trucks:	59.0	57.5	51.2	49.6	58.1	58.3
Heavy Trucks:	61.4	60.0	50.9	52.2	60.5	60.6
Vehicle Noise:	66.6	64.9	61.1	57.1	65.6	66.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	25	55	118	254
CNEL:	27	58	125	270

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

Scenario: E
Road Name: Van Ness Av.
Road Segment: s/o Del Amo Blvd.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,840 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,084 vehicles
Vehicle Speed:	35 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%	97.02%
Medium Trucks:	84.8%	4.9%	10.3%	2.36%
Heavy Trucks:	86.5%	2.7%	10.8%	0.62%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	64.30	-0.53	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	75.75	-16.67	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-22.47	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:	62.9	61.0	59.2	53.2	61.8	62.4
Medium Trucks:	58.2	56.7	50.4	48.8	57.3	57.5
Heavy Trucks:	58.2	56.8	47.8	49.0	57.4	57.5
Vehicle Noise:	65.1	63.4	60.0	55.6	64.1	64.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	44	94	203
CNEL:	22	47	101	217

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

Scenario: E+P
Road Name: Van Ness Av.
Road Segment: s/o Del Amo Blvd.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,086 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,109 vehicles
Vehicle Speed:	35 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%	96.80%
Medium Trucks:	84.8%	4.9%	10.3%	2.33%
Heavy Trucks:	86.5%	2.7%	10.8%	0.87%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	64.30	-0.44	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	75.75	-16.62	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-20.89	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:	63.0	61.1	59.3	53.3	61.9	62.5
Medium Trucks:	58.3	56.8	50.4	48.8	57.3	57.5
Heavy Trucks:	59.8	58.4	49.4	50.6	59.0	59.1
Vehicle Noise:	65.6	63.9	60.2	56.1	64.6	65.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	22	47	101	217
CNEL:	23	50	107	231

Monday, December 20, 2021

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

Scenario: OY 2023
Road Name: Van Ness Av.
Road Segment: s/o Del Amo Blvd.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	10,970 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,097 vehicles
Vehicle Speed:	35 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%	97.02%
Medium Trucks:	84.8%	4.9%	10.3%	2.36%
Heavy Trucks:	86.5%	2.7%	10.8%	0.62%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	64.30	-0.48	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	75.75	-16.61	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-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:	62.9	61.0	59.3	53.2	61.8	62.4
Medium Trucks:	58.3	56.8	50.4	48.9	57.3	57.6
Heavy Trucks:	58.3	56.9	47.8	49.1	57.4	57.6
Vehicle Noise:	65.2	63.5	60.1	55.7	64.2	64.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	20	44	95	205
CNEL:	22	47	102	219

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

Scenario: OYP 2023
Road Name: Van Ness Av.
Road Segment: s/o Del Amo Blvd.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	11,216 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,122 vehicles
Vehicle Speed:	35 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%	96.80%
Medium Trucks:	84.8%	4.9%	10.3%	2.33%
Heavy Trucks:	86.5%	2.7%	10.8%	0.87%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	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:	64.30	-0.39	0.31	-1.20	-4.65	0.000	0.000
Medium Trucks:	75.75	-16.57	0.34	-1.20	-4.87	0.000	0.000
Heavy Trucks:	81.57	-20.86	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:	63.0	61.1	59.4	53.3	61.9	62.5
Medium Trucks:	58.3	56.8	50.4	48.9	57.4	57.6
Heavy Trucks:	59.8	58.4	49.4	50.6	59.0	59.1
Vehicle Noise:	65.6	63.9	60.3	56.1	64.6	65.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	22	47	102	219
CNEL:	23	50	108	233

Monday, December 20, 2021

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

Scenario: E
Road Name: Western Av.
Road Segment: n/o I-405 NB Ramp
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	22,560 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,256 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	97.02%
Medium Trucks:	84.8%	4.9%	10.3%	2.36%
Heavy Trucks:	86.5%	2.7%	10.8%	0.62%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	2.08	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	77.72	-14.06	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	82.99	-19.87	-1.53	-1.20	-5.29	0.000	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	63.9	62.2	56.1	64.7	65.4
Medium Trucks:	60.9	59.4	53.1	51.5	60.0	60.2
Heavy Trucks:	60.4	59.0	49.9	51.2	59.5	59.7
Vehicle Noise:	67.9	66.2	62.9	58.3	66.9	67.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	42	89	193	415
CNEL:	44	96	206	445

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

Scenario: E+P
Road Name: Western Av.
Road Segment: n/o I-405 NB Ramp
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,052 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,305 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	96.81%
Medium Trucks:	84.8%	4.9%	10.3%	2.33%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	2.16	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	77.72	-14.02	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	82.99	-18.34	-1.53	-1.20	-5.29	0.000	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	64.0	62.3	56.2	64.8	65.4
Medium Trucks:	61.0	59.5	53.1	51.6	60.0	60.2
Heavy Trucks:	61.9	60.5	51.5	52.7	61.1	61.2
Vehicle Noise:	68.3	66.6	63.1	58.7	67.3	67.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	44	95	204	440
CNEL:	47	101	218	470

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

Scenario: OY 2023
Road Name: Western Av.
Road Segment: n/o I-405 NB Ramp
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	22,770 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,277 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	97.02%
Medium Trucks:	84.8%	4.9%	10.3%	2.36%
Heavy Trucks:	86.5%	2.7%	10.8%	0.62%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	2.12	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	77.72	-14.02	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	82.99	-19.83	-1.53	-1.20	-5.29	0.000	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	64.0	62.2	56.2	64.8	65.4
Medium Trucks:	61.0	59.5	53.1	51.6	60.0	60.2
Heavy Trucks:	60.4	59.0	50.0	51.2	59.6	59.7
Vehicle Noise:	67.9	66.2	62.9	58.4	66.9	67.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	42	90	194	418
CNEL:	45	96	208	447

Monday, December 20, 2021

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

Scenario: OYP 2023
Road Name: Western Av.
Road Segment: n/o I-405 NB Ramp
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	23,262 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,326 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	96.81%
Medium Trucks:	84.8%	4.9%	10.3%	2.33%
Heavy Trucks:	86.5%	2.7%	10.8%	0.86%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	2.20	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	77.72	-13.98	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	82.99	-18.32	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.0	64.1	62.3	56.2	64.9	65.5
Medium Trucks:	61.0	59.5	53.1	51.6	60.1	60.3
Heavy Trucks:	61.9	60.5	51.5	52.7	61.1	61.2
Vehicle Noise:	68.3	66.6	63.1	58.8	67.3	67.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	44	95	205	443
CNEL:	47	102	219	472

Monday, December 20, 2021

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

Scenario: E
Road Name: Western Av.
Road Segment: n/o 190th St.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,180 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,018 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	97.02%
Medium Trucks:	84.8%	4.9%	10.3%	2.36%
Heavy Trucks:	86.5%	2.7%	10.8%	0.62%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	3.34	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	77.72	-12.80	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	82.99	-18.60	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.1	65.2	63.4	57.4	66.0	66.6
Medium Trucks:	62.2	60.7	54.3	52.8	61.2	61.5
Heavy Trucks:	61.7	60.2	51.2	52.5	60.8	60.9
Vehicle Noise:	69.2	67.4	64.2	59.6	68.1	68.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	50	109	234	504
CNEL:	54	116	251	540

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

Scenario: E+P
Road Name: Western Av.
Road Segment: n/o 190th St.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,730 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,173 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	96.53%
Medium Trucks:	84.8%	4.9%	10.3%	2.30%
Heavy Trucks:	86.5%	2.7%	10.8%	1.17%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	3.54	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	77.72	-12.70	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	82.99	-15.62	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.3	65.4	63.6	57.6	66.2	66.8
Medium Trucks:	62.3	60.8	54.4	52.9	61.3	61.6
Heavy Trucks:	64.6	63.2	54.2	55.4	63.8	63.9
Vehicle Noise:	70.0	68.3	64.5	60.5	69.0	69.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	57	124	266	574
CNEL:	61	132	283	611

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

Scenario: OY 2023
Road Name: Western Av.
Road Segment: n/o 190th St.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,480 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,048 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	97.02%
Medium Trucks:	84.8%	4.9%	10.3%	2.36%
Heavy Trucks:	86.5%	2.7%	10.8%	0.62%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	3.38	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	77.72	-12.76	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	82.99	-18.56	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.2	65.3	63.5	57.4	66.1	66.7
Medium Trucks:	62.2	60.7	54.4	52.8	61.3	61.5
Heavy Trucks:	61.7	60.3	51.2	52.5	60.9	61.0
Vehicle Noise:	69.2	67.5	64.2	59.6	68.2	68.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	51	109	235	507
CNEL:	54	117	252	543

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

Scenario: OYP 2023
Road Name: Western Av.
Road Segment: n/o 190th St.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	32,030 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,203 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	96.54%
Medium Trucks:	84.8%	4.9%	10.3%	2.30%
Heavy Trucks:	86.5%	2.7%	10.8%	1.17%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	3.58	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	77.72	-12.66	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	82.99	-15.59	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.3	65.4	63.7	57.6	66.2	66.9
Medium Trucks:	62.3	60.8	54.5	52.9	61.4	61.6
Heavy Trucks:	64.7	63.2	54.2	55.5	63.8	63.9
Vehicle Noise:	70.0	68.3	64.6	60.5	69.0	69.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	58	124	268	577
CNEL:	61	132	285	614

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

Scenario: E
Road Name: Western Av.
Road Segment: s/o 190th St.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,610 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,961 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	97.02%
Medium Trucks:	84.8%	4.9%	10.3%	2.36%
Heavy Trucks:	86.5%	2.7%	10.8%	0.62%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	3.26	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	77.72	-12.88	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	82.99	-18.69	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.0	65.1	63.4	57.3	65.9	66.5
Medium Trucks:	62.1	60.6	54.2	52.7	61.2	61.4
Heavy Trucks:	61.6	60.2	51.1	52.4	60.7	60.9
Vehicle Noise:	69.1	67.4	64.1	59.5	68.1	68.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	50	107	231	498
CNEL:	53	115	247	533

Monday, December 20, 2021

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

Scenario: E+P
Road Name: Western Av.
Road Segment: s/o 190th St.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,840 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,084 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	96.62%
Medium Trucks:	84.8%	4.9%	10.3%	2.31%
Heavy Trucks:	86.5%	2.7%	10.8%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	3.42	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	77.72	-12.80	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	82.99	-16.13	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.2	65.3	63.5	57.5	66.1	66.7
Medium Trucks:	62.2	60.7	54.3	52.8	61.2	61.5
Heavy Trucks:	64.1	62.7	53.7	54.9	63.3	63.4
Vehicle Noise:	69.8	68.1	64.4	60.2	68.8	69.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	55	119	257	554
CNEL:	59	127	274	590

Monday, December 20, 2021

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

Scenario: OY 2023
Road Name: Western Av.
Road Segment: s/o 190th St.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,890 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,989 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	97.02%
Medium Trucks:	84.8%	4.9%	10.3%	2.36%
Heavy Trucks:	86.5%	2.7%	10.8%	0.62%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	3.30	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	77.72	-12.84	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	82.99	-18.65	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.1	65.2	63.4	57.3	66.0	66.6
Medium Trucks:	62.1	60.6	54.3	52.7	61.2	61.4
Heavy Trucks:	61.6	60.2	51.2	52.4	60.8	60.9
Vehicle Noise:	69.1	67.4	64.1	59.6	68.1	68.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	50	108	232	501
CNEL:	54	116	249	536

Monday, December 20, 2021

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

Scenario: OYP 2023
Road Name: Western Av.
Road Segment: s/o 190th St.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,120 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,112 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	96.62%
Medium Trucks:	84.8%	4.9%	10.3%	2.31%
Heavy Trucks:	86.5%	2.7%	10.8%	1.07%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	3.46	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	77.72	-12.76	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	82.99	-16.11	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.2	65.3	63.6	57.5	66.1	66.7
Medium Trucks:	62.2	60.7	54.4	52.8	61.3	61.5
Heavy Trucks:	64.2	62.7	53.7	54.9	63.3	63.4
Vehicle Noise:	69.8	68.1	64.4	60.3	68.8	69.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	56	120	258	557
CNEL:	59	128	275	593

Monday, December 20, 2021

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

Scenario: E
Road Name: Western Av.
Road Segment: s/o 195th St.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	29,800 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,980 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	97.02%
Medium Trucks:	84.8%	4.9%	10.3%	2.36%
Heavy Trucks:	86.5%	2.7%	10.8%	0.62%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	3.28	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	77.72	-12.85	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	82.99	-18.66	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.1	65.2	63.4	57.3	66.0	66.6
Medium Trucks:	62.1	60.6	54.3	52.7	61.2	61.4
Heavy Trucks:	61.6	60.2	51.1	52.4	60.8	60.9
Vehicle Noise:	69.1	67.4	64.1	59.6	68.1	68.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	50	108	232	500
CNEL:	54	115	248	535

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

Scenario: E+P
Road Name: Western Av.
Road Segment: s/o 195th St.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,292 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,029 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	96.86%
Medium Trucks:	84.8%	4.9%	10.3%	2.34%
Heavy Trucks:	86.5%	2.7%	10.8%	0.80%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	3.35	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	77.72	-12.82	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	82.99	-17.46	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.1	65.2	63.5	57.4	66.0	66.6
Medium Trucks:	62.2	60.7	54.3	52.8	61.2	61.4
Heavy Trucks:	62.8	61.4	52.3	53.6	62.0	62.1
Vehicle Noise:	69.4	67.7	64.2	59.9	68.4	68.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	52	113	243	523
CNEL:	56	120	259	558

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

Scenario: OY 2023
Road Name: Western Av.
Road Segment: s/o 195th St.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,090 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,009 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	97.02%
Medium Trucks:	84.8%	4.9%	10.3%	2.36%
Heavy Trucks:	86.5%	2.7%	10.8%	0.62%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	3.33	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	77.72	-12.81	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	82.99	-18.62	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.1	65.2	63.4	57.4	66.0	66.6
Medium Trucks:	62.2	60.7	54.3	52.8	61.2	61.5
Heavy Trucks:	61.6	60.2	51.2	52.4	60.8	60.9
Vehicle Noise:	69.2	67.4	64.2	59.6	68.1	68.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	50	108	233	503
CNEL:	54	116	250	539

Monday, December 20, 2021

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

Scenario: OYP 2023
Road Name: Western Av.
Road Segment: s/o 195th St.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	30,582 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,058 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	96.86%
Medium Trucks:	84.8%	4.9%	10.3%	2.34%
Heavy Trucks:	86.5%	2.7%	10.8%	0.80%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	3.39	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	77.72	-12.78	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	82.99	-17.43	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.2	65.3	63.5	57.4	66.1	66.7
Medium Trucks:	62.2	60.7	54.3	52.8	61.3	61.5
Heavy Trucks:	62.8	61.4	52.4	53.6	62.0	62.1
Vehicle Noise:	69.4	67.7	64.3	59.9	68.4	68.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	53	113	244	526
CNEL:	56	121	261	562

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

Scenario: E
Road Name: Western Av.
Road Segment: n/o Del Amo Blvd.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,290 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,129 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	97.02%
Medium Trucks:	84.8%	4.9%	10.3%	2.36%
Heavy Trucks:	86.5%	2.7%	10.8%	0.62%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	3.50	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	77.72	-12.64	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	82.99	-18.45	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.3	65.4	63.6	57.5	66.2	66.8
Medium Trucks:	62.3	60.8	54.5	52.9	61.4	61.6
Heavy Trucks:	61.8	60.4	51.4	52.6	61.0	61.1
Vehicle Noise:	69.3	67.6	64.3	59.8	68.3	68.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	52	111	240	516
CNEL:	55	119	257	553

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

Scenario: E+P
Road Name: Western Av.
Road Segment: n/o Del Amo Blvd.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,782 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,178 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	96.86%
Medium Trucks:	84.8%	4.9%	10.3%	2.34%
Heavy Trucks:	86.5%	2.7%	10.8%	0.80%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	3.56	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	77.72	-12.61	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	82.99	-17.30	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.3	65.4	63.7	57.6	66.2	66.8
Medium Trucks:	62.4	60.9	54.5	53.0	61.4	61.7
Heavy Trucks:	63.0	61.5	52.5	53.8	62.1	62.2
Vehicle Noise:	69.6	67.9	64.4	60.1	68.6	69.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	54	116	250	539
CNEL:	58	124	267	576

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

Scenario: OY 2023
Road Name: Western Av.
Road Segment: n/o Del Amo Blvd.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	31,600 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,160 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	97.02%
Medium Trucks:	84.8%	4.9%	10.3%	2.36%
Heavy Trucks:	86.5%	2.7%	10.8%	0.62%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	3.54	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	77.72	-12.60	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	82.99	-18.41	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.3	65.4	63.6	57.6	66.2	66.8
Medium Trucks:	62.4	60.9	54.5	53.0	61.4	61.7
Heavy Trucks:	61.9	60.4	51.4	52.7	61.0	61.1
Vehicle Noise:	69.4	67.6	64.4	59.8	68.3	68.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	52	112	241	520
CNEL:	56	120	258	557

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

Scenario: OYP 2023
Road Name: Western Av.
Road Segment: n/o Del Amo Blvd.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	32,092 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	3,209 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	96.87%
Medium Trucks:	84.8%	4.9%	10.3%	2.34%
Heavy Trucks:	86.5%	2.7%	10.8%	0.79%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	3.60	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	77.72	-12.57	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	82.99	-17.26	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.4	65.5	63.7	57.6	66.3	66.9
Medium Trucks:	62.4	60.9	54.5	53.0	61.5	61.7
Heavy Trucks:	63.0	61.6	52.5	53.8	62.1	62.3
Vehicle Noise:	69.6	67.9	64.5	60.1	68.6	69.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	54	117	252	542
CNEL:	58	125	269	579

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

Scenario: E | Project Name: Torrance Commerce
Road Name: Western Av. | Job Number: 14092
Road Segment: s/o Del Amo Blvd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,770 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,577 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	97.02%
Medium Trucks:	84.8%	4.9%	10.3%	2.36%
Heavy Trucks:	86.5%	2.7%	10.8%	0.62%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	2.65	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	77.72	-13.49	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	82.99	-19.29	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.4	64.5	62.8	56.7	65.3	65.9
Medium Trucks:	61.5	60.0	53.6	52.1	60.5	60.8
Heavy Trucks:	61.0	59.6	50.5	51.8	60.1	60.2
Vehicle Noise:	68.5	66.8	63.5	58.9	67.5	67.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	45	98	211	454
CNEL:	49	105	225	486

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

Scenario: E+P | Project Name: Torrance Commerce
Road Name: Western Av. | Job Number: 14092
Road Segment: s/o Del Amo Blvd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,262 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,626 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	96.83%
Medium Trucks:	84.8%	4.9%	10.3%	2.34%
Heavy Trucks:	86.5%	2.7%	10.8%	0.83%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	2.73	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	77.72	-13.45	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	82.99	-17.93	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.5	64.6	62.8	56.8	65.4	66.0
Medium Trucks:	61.5	60.0	53.7	52.1	60.6	60.8
Heavy Trucks:	62.3	60.9	51.9	53.1	61.5	61.6
Vehicle Noise:	68.8	67.1	63.6	59.3	67.8	68.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	48	103	222	478
CNEL:	51	110	237	510

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

Scenario: OY 2023 | Project Name: Torrance Commerce
Road Name: Western Av. | Job Number: 14092
Road Segment: s/o Del Amo Blvd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,030 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,603 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	97.02%
Medium Trucks:	84.8%	4.9%	10.3%	2.36%
Heavy Trucks:	86.5%	2.7%	10.8%	0.62%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	2.70	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	77.72	-13.44	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	82.99	-19.25	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.5	64.6	62.8	56.7	65.4	66.0
Medium Trucks:	61.5	60.0	53.7	52.1	60.6	60.8
Heavy Trucks:	61.0	59.6	50.6	51.8	60.2	60.3
Vehicle Noise:	68.5	66.8	63.5	59.0	67.5	67.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	46	98	212	457
CNEL:	49	105	227	489

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

Scenario: OYP 2023 | Project Name: Torrance Commerce
Road Name: Western Av. | Job Number: 14092
Road Segment: s/o Del Amo Blvd.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,522 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,652 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	96.83%
Medium Trucks:	84.8%	4.9%	10.3%	2.34%
Heavy Trucks:	86.5%	2.7%	10.8%	0.83%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	66.51	2.77	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	77.72	-13.41	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	82.99	-17.90	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	66.5	64.6	62.9	56.8	65.4	66.0
Medium Trucks:	61.6	60.1	53.7	52.2	60.6	60.9
Heavy Trucks:	62.4	60.9	51.9	53.2	61.5	61.6
Vehicle Noise:	68.8	67.1	63.7	59.3	67.8	68.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	48	104	223	481
CNEL:	51	111	238	513

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

Scenario: E
Road Name: 190th St.
Road Segment: w/o Van Ness Av.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,640 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,664 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	97.02%
Medium Trucks:	84.8%	4.9%	10.3%	2.36%
Heavy Trucks:	86.5%	2.7%	10.8%	0.62%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.29	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	79.45	-13.85	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-19.66	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.0	66.1	64.3	58.3	66.9	67.5
Medium Trucks:	62.9	61.4	55.0	53.5	61.9	62.1
Heavy Trucks:	61.9	60.4	51.4	52.7	61.0	61.1
Vehicle Noise:	69.9	68.2	65.0	60.3	68.9	69.3

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	56	121	262	564
CNEL:	60	130	281	605

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

Scenario: E+P
Road Name: 190th St.
Road Segment: w/o Van Ness Av.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,378 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,738 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	96.75%
Medium Trucks:	84.8%	4.9%	10.3%	2.32%
Heavy Trucks:	86.5%	2.7%	10.8%	0.93%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.39	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	79.45	-13.80	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-17.80	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.1	66.2	64.4	58.4	67.0	67.6
Medium Trucks:	62.9	61.4	55.1	53.5	62.0	62.2
Heavy Trucks:	63.7	62.3	53.3	54.5	62.9	63.0
Vehicle Noise:	70.3	68.6	65.2	60.8	69.3	69.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	60	130	280	603
CNEL:	64	139	299	644

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

Scenario: OY 2023
Road Name: 190th St.
Road Segment: w/o Van Ness Av.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,920 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,692 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	97.02%
Medium Trucks:	84.8%	4.9%	10.3%	2.36%
Heavy Trucks:	86.5%	2.7%	10.8%	0.62%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.33	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	79.45	-13.81	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-19.61	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.0	66.2	64.4	58.3	67.0	67.6
Medium Trucks:	62.9	61.4	55.0	53.5	62.0	62.2
Heavy Trucks:	61.9	60.5	51.5	52.7	61.1	61.2
Vehicle Noise:	70.0	68.2	65.1	60.4	68.9	69.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	57	122	264	568
CNEL:	61	131	283	609

Monday, December 20, 2021

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

Scenario: OYP 2023
Road Name: 190th St.
Road Segment: w/o Van Ness Av.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	27,658 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,766 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	96.75%
Medium Trucks:	84.8%	4.9%	10.3%	2.32%
Heavy Trucks:	86.5%	2.7%	10.8%	0.92%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.44	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	79.45	-13.76	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-17.77	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.2	66.3	64.5	58.4	67.1	67.7
Medium Trucks:	63.0	61.5	55.1	53.6	62.0	62.2
Heavy Trucks:	63.8	62.3	53.3	54.5	62.9	63.0
Vehicle Noise:	70.4	68.7	65.2	60.8	69.4	69.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	61	131	282	607
CNEL:	65	140	301	649

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

Scenario: E
Road Name: 190th St.
Road Segment: e/o Van Ness Av.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,290 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,529 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	97.02%
Medium Trucks:	84.8%	4.9%	10.3%	2.36%
Heavy Trucks:	86.5%	2.7%	10.8%	0.62%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.06	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	79.45	-14.08	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-19.88	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.8	65.9	64.1	58.1	66.7	67.3
Medium Trucks:	62.6	61.1	54.8	53.2	61.7	61.9
Heavy Trucks:	61.6	60.2	51.2	52.4	60.8	60.9
Vehicle Noise:	69.7	67.9	64.8	60.1	68.7	69.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	54	117	253	545
CNEL:	58	126	271	584

Monday, December 20, 2021

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

Scenario: E+P
Road Name: 190th St.
Road Segment: e/o Van Ness Av.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,151 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,615 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	96.69%
Medium Trucks:	84.8%	4.9%	10.3%	2.32%
Heavy Trucks:	86.5%	2.7%	10.8%	0.99%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.19	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	79.45	-14.01	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-17.69	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.9	66.0	64.2	58.2	66.8	67.4
Medium Trucks:	62.7	61.2	54.8	53.3	61.8	62.0
Heavy Trucks:	63.8	62.4	53.4	54.6	63.0	63.1
Vehicle Noise:	70.2	68.5	65.0	60.7	69.2	69.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	59	127	274	591
CNEL:	63	136	293	631

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

Scenario: OY 2023
Road Name: 190th St.
Road Segment: e/o Van Ness Av.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,560 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,556 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	97.02%
Medium Trucks:	84.8%	4.9%	10.3%	2.36%
Heavy Trucks:	86.5%	2.7%	10.8%	0.62%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.11	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	79.45	-14.03	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-19.84	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.8	65.9	64.2	58.1	66.7	67.3
Medium Trucks:	62.7	61.2	54.8	53.3	61.7	62.0
Heavy Trucks:	61.7	60.3	51.2	52.5	60.8	61.0
Vehicle Noise:	69.7	68.0	64.8	60.2	68.7	69.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	55	118	255	549
CNEL:	59	127	273	588

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

Scenario: OYP 2023
Road Name: 190th St.
Road Segment: e/o Van Ness Av.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	26,421 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,642 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	96.69%
Medium Trucks:	84.8%	4.9%	10.3%	2.32%
Heavy Trucks:	86.5%	2.7%	10.8%	0.99%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.24	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	79.45	-13.97	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-17.66	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	68.0	66.1	64.3	58.2	66.9	67.5
Medium Trucks:	62.8	61.2	54.9	53.3	61.8	62.0
Heavy Trucks:	63.9	62.4	53.4	54.7	63.0	63.1
Vehicle Noise:	70.2	68.5	65.1	60.7	69.2	69.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	59	128	276	595
CNEL:	64	137	295	635

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

Scenario: E | Project Name: Torrance Commerce
Road Name: 190th St. | Job Number: 14092
Road Segment: w/o Western Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,060 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,506 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	97.02%
Medium Trucks:	84.8%	4.9%	10.3%	2.36%
Heavy Trucks:	86.5%	2.7%	10.8%	0.62%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.02	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	79.45	-14.12	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-19.92	-1.53	-1.20	-5.29	0.000	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	65.8	64.1	58.0	66.6	67.2
Medium Trucks:	62.6	61.1	54.7	53.2	61.6	61.9
Heavy Trucks:	61.6	60.2	51.1	52.4	60.7	60.9
Vehicle Noise:	69.6	67.9	64.7	60.1	68.6	69.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	54	117	251	541
CNEL:	58	125	270	581

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

Scenario: E+P | Project Name: Torrance Commerce
Road Name: 190th St. | Job Number: 14092
Road Segment: w/o Western Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,700 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,570 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	96.77%
Medium Trucks:	84.8%	4.9%	10.3%	2.33%
Heavy Trucks:	86.5%	2.7%	10.8%	0.90%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.12	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	79.45	-14.07	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-18.19	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.8	65.9	64.2	58.1	66.7	67.3
Medium Trucks:	62.7	61.1	54.8	53.2	61.7	61.9
Heavy Trucks:	63.3	61.9	52.9	54.1	62.5	62.6
Vehicle Noise:	70.0	68.3	64.9	60.5	69.0	69.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	58	124	267	576
CNEL:	62	133	286	616

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

Scenario: OY 2023 | Project Name: Torrance Commerce
Road Name: 190th St. | Job Number: 14092
Road Segment: w/o Western Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,310 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,531 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	97.02%
Medium Trucks:	84.8%	4.9%	10.3%	2.36%
Heavy Trucks:	86.5%	2.7%	10.8%	0.62%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.06	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	79.45	-14.08	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-19.88	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.8	65.9	64.1	58.1	66.7	67.3
Medium Trucks:	62.6	61.1	54.8	53.2	61.7	61.9
Heavy Trucks:	61.6	60.2	51.2	52.4	60.8	60.9
Vehicle Noise:	69.7	67.9	64.8	60.1	68.7	69.1

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	55	117	253	545
CNEL:	58	126	271	585

Monday, December 20, 2021

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

Scenario: OYP 2023 | Project Name: Torrance Commerce
Road Name: 190th St. | Job Number: 14092
Road Segment: w/o Western Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	25,950 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	2,595 vehicles
Vehicle Speed:	45 mph
Near/Far Lane Distance:	50 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	67.0 feet
Centerline Dist. to Observer:	67.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	96.77%
Medium Trucks:	84.8%	4.9%	10.3%	2.33%
Heavy Trucks:	86.5%	2.7%	10.8%	0.90%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	62.362
Medium Trucks:	62.220
Heavy Trucks:	62.234

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	68.46	2.16	-1.54	-1.20	-4.71	0.000	0.000
Medium Trucks:	79.45	-14.03	-1.53	-1.20	-4.88	0.000	0.000
Heavy Trucks:	84.25	-18.16	-1.53	-1.20	-5.29	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	67.9	66.0	64.2	58.2	66.8	67.4
Medium Trucks:	62.7	61.2	54.8	53.3	61.7	62.0
Heavy Trucks:	63.4	61.9	52.9	54.2	62.5	62.6
Vehicle Noise:	70.1	68.4	65.0	60.5	69.1	69.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	58	125	269	579
CNEL:	62	133	288	620

Monday, December 20, 2021

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

Scenario: E
Road Name: 195th St.
Road Segment: w/o Gramercy Pl.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	700 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	70 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	45 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	97.02%
Medium Trucks:	84.8%	4.9%	10.3%	2.36%
Heavy Trucks:	86.5%	2.7%	10.8%	0.62%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	33.448
Medium Trucks:	33.182
Heavy Trucks:	33.208

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-10.97	2.52	-1.20	-4.59	0.000	0.000
Medium Trucks:	70.80	-27.10	2.57	-1.20	-4.87	0.000	0.000
Heavy Trucks:	77.97	-32.91	2.56	-1.20	-5.56	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	49.1	47.2	45.4	39.4	48.0	48.6
Medium Trucks:	45.1	43.6	37.2	35.6	44.1	44.3
Heavy Trucks:	46.4	45.0	36.0	37.2	45.6	45.7
Vehicle Noise:	52.0	50.3	46.4	42.4	51.0	51.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	2	5	10	22
CNEL:	2	5	11	23

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

Scenario: E+P
Road Name: 195th St.
Road Segment: w/o Gramercy Pl.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,561 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	156 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	45 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	91.49%
Medium Trucks:	84.8%	4.9%	10.3%	1.63%
Heavy Trucks:	86.5%	2.7%	10.8%	6.87%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	33.448
Medium Trucks:	33.182
Heavy Trucks:	33.208

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-7.74	2.52	-1.20	-4.59	0.000	0.000
Medium Trucks:	70.80	-25.22	2.57	-1.20	-4.87	0.000	0.000
Heavy Trucks:	77.97	-18.98	2.56	-1.20	-5.56	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	52.3	50.4	48.6	42.6	51.2	51.8
Medium Trucks:	46.9	45.4	39.1	37.5	46.0	46.2
Heavy Trucks:	60.4	58.9	49.9	51.1	59.5	59.6
Vehicle Noise:	61.2	59.7	52.5	51.9	60.3	60.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	9	19	42	90
CNEL:	9	20	43	93

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

Scenario: OY 2023
Road Name: 195th St.
Road Segment: w/o Gramercy Pl.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	700 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	70 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	45 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	97.02%
Medium Trucks:	84.8%	4.9%	10.3%	2.36%
Heavy Trucks:	86.5%	2.7%	10.8%	0.62%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	33.448
Medium Trucks:	33.182
Heavy Trucks:	33.208

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-10.97	2.52	-1.20	-4.59	0.000	0.000
Medium Trucks:	70.80	-27.10	2.57	-1.20	-4.87	0.000	0.000
Heavy Trucks:	77.97	-32.91	2.56	-1.20	-5.56	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	49.1	47.2	45.4	39.4	48.0	48.6
Medium Trucks:	45.1	43.6	37.2	35.6	44.1	44.3
Heavy Trucks:	46.4	45.0	36.0	37.2	45.6	45.7
Vehicle Noise:	52.0	50.3	46.4	42.4	51.0	51.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	2	5	10	22
CNEL:	2	5	11	23

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

Scenario: OYP 2023
Road Name: 195th St.
Road Segment: w/o Gramercy Pl.
Project Name: Torrance Commerce
Job Number: 14092

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,561 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	156 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	45 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	91.49%
Medium Trucks:	84.8%	4.9%	10.3%	1.63%
Heavy Trucks:	86.5%	2.7%	10.8%	6.87%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	33.448
Medium Trucks:	33.182
Heavy Trucks:	33.208

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	58.73	-7.74	2.52	-1.20	-4.59	0.000	0.000
Medium Trucks:	70.80	-25.22	2.57	-1.20	-4.87	0.000	0.000
Heavy Trucks:	77.97	-18.98	2.56	-1.20	-5.56	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	52.3	50.4	48.6	42.6	51.2	51.8
Medium Trucks:	46.9	45.4	39.1	37.5	46.0	46.2
Heavy Trucks:	60.4	58.9	49.9	51.1	59.5	59.6
Vehicle Noise:	61.2	59.7	52.5	51.9	60.3	60.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	9	19	42	90
CNEL:	9	20	43	93

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

Scenario: E | Project Name: Torrance Commerce
Road Name: Del Amo Blvd. | Job Number: 14092
Road Segment: w/o Van Ness Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,330 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,433 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	42 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	61.0 feet
Centerline Dist. to Observer:	61.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	97.02%
Medium Trucks:	84.8%	4.9%	10.3%	2.36%
Heavy Trucks:	86.5%	2.7%	10.8%	0.62%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	57.489
Medium Trucks:	57.335
Heavy Trucks:	57.350

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	0.69	-1.01	-1.20	-4.69	0.000	0.000
Medium Trucks:	75.75	-15.45	-1.00	-1.20	-4.88	0.000	0.000
Heavy Trucks:	81.57	-21.26	-1.00	-1.20	-5.33	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.8	60.9	59.1	53.1	61.7	62.3
Medium Trucks:	58.1	56.6	50.2	48.7	57.1	57.4
Heavy Trucks:	58.1	56.7	47.7	48.9	57.3	57.4
Vehicle Noise:	65.0	63.3	59.9	55.5	64.0	64.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	24	52	113	243
CNEL:	26	56	121	260

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

Scenario: E+P | Project Name: Torrance Commerce
Road Name: Del Amo Blvd. | Job Number: 14092
Road Segment: w/o Van Ness Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,576 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,458 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	42 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	61.0 feet
Centerline Dist. to Observer:	61.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	96.85%
Medium Trucks:	84.8%	4.9%	10.3%	2.34%
Heavy Trucks:	86.5%	2.7%	10.8%	0.81%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	57.489
Medium Trucks:	57.335
Heavy Trucks:	57.350

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	0.75	-1.01	-1.20	-4.69	0.000	0.000
Medium Trucks:	75.75	-15.42	-1.00	-1.20	-4.88	0.000	0.000
Heavy Trucks:	81.57	-20.02	-1.00	-1.20	-5.33	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.8	60.9	59.2	53.1	61.7	62.3
Medium Trucks:	58.1	56.6	50.3	48.7	57.2	57.4
Heavy Trucks:	59.4	57.9	48.9	50.1	58.5	58.6
Vehicle Noise:	65.4	63.7	60.0	55.8	64.4	64.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	26	55	119	256
CNEL:	27	59	127	273

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

Scenario: OY 2023 | Project Name: Torrance Commerce
Road Name: Del Amo Blvd. | Job Number: 14092
Road Segment: w/o Van Ness Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,480 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,448 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	42 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	61.0 feet
Centerline Dist. to Observer:	61.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	97.02%
Medium Trucks:	84.8%	4.9%	10.3%	2.36%
Heavy Trucks:	86.5%	2.7%	10.8%	0.62%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	57.489
Medium Trucks:	57.335
Heavy Trucks:	57.350

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	0.73	-1.01	-1.20	-4.69	0.000	0.000
Medium Trucks:	75.75	-15.41	-1.00	-1.20	-4.88	0.000	0.000
Heavy Trucks:	81.57	-21.21	-1.00	-1.20	-5.33	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.8	60.9	59.2	53.1	61.7	62.3
Medium Trucks:	58.1	56.6	50.3	48.7	57.2	57.4
Heavy Trucks:	58.2	56.7	47.7	48.9	57.3	57.4
Vehicle Noise:	65.1	63.4	59.9	55.5	64.1	64.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	25	53	114	245
CNEL:	26	56	122	262

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

Scenario: OYP 2023 | Project Name: Torrance Commerce
Road Name: Del Amo Blvd. | Job Number: 14092
Road Segment: w/o Van Ness Av.

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	14,726 vehicles
Peak Hour Percentage:	10.00%
Peak Hour Volume:	1,473 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	42 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	61.0 feet
Centerline Dist. to Observer:	61.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 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%	96.85%
Medium Trucks:	84.8%	4.9%	10.3%	2.34%
Heavy Trucks:	86.5%	2.7%	10.8%	0.81%

Noise Source Elevations (in feet)

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

Lane Equivalent Distance (in feet)

Autos:	57.489
Medium Trucks:	57.335
Heavy Trucks:	57.350

FHWA Noise Model Calculations

VehicleType	REMEL	Traffic Flow	Distance	Finite Road	Fresnel	Barrier Atten	Berm Atten
Autos:	64.30	0.80	-1.01	-1.20	-4.69	0.000	0.000
Medium Trucks:	75.75	-15.38	-1.00	-1.20	-4.88	0.000	0.000
Heavy Trucks:	81.57	-19.98	-1.00	-1.20	-5.33	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	Leq Peak Hour	Leq Day	Leq Evening	Leq Night	Ldn	CNEL
Autos:	62.9	61.0	59.2	53.2	61.8	62.4
Medium Trucks:	58.2	56.7	50.3	48.8	57.2	57.5
Heavy Trucks:	59.4	58.0	48.9	50.2	58.5	58.7
Vehicle Noise:	65.4	63.7	60.1	55.9	64.4	64.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	65 dBA	60 dBA	55 dBA
Ldn:	26	56	120	258
CNEL:	27	59	128	275

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APPENDIX 9.1:

CADNAA OPERATIONAL NOISE MODEL INPUTS

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14092 -Torrance Commerce Center Phase 3

CadnaA Noise Prediction Model: 14092_03.cna
Date: 15.12.21
Analyst: S. Shami

Calculation Configuration

Configuration	
Parameter	Value
General	
Country	(user defined)
Max. Error (dB)	0.00
Max. Search Radius (#(Unit,LEN))	2000.01
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (#(Unit,LEN))	999.99
Min. Length of Section (#(Unit,LEN))	1.01
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	960.00
Reference Time Night (min)	480.00
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	5.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	2
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rvcr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Incl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (#(Unit,TEMP))	10
rel. Humidity (%)	70
Ground Absorption G	0.50
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (RLS-90)	
Strictly acc. to RLS-90	
Railways (FTA/FRA)	
Aircraft (???)	
Strictly acc. to AzB	

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Night	CNEL	Day	Night	CNEL	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
RECEIVERS		R1	39.2	38.3	44.8	55.0	50.0	0.0				5.00	a	5934062.05	2262231.34	5.00
RECEIVERS		R2	41.7	40.8	47.2	55.0	50.0	0.0				5.00	a	5934558.43	2262223.03	5.00
RECEIVERS		R3	49.9	49.4	56.0	55.0	50.0	0.0				5.00	a	5935686.07	2262311.98	5.00
RECEIVERS		R4	35.5	34.7	41.2	55.0	50.0	0.0				5.00	a	5938301.21	2261189.91	5.00
RECEIVERS		R5	36.2	35.8	42.4	55.0	50.0	0.0				5.00	a	5936569.28	2258085.61	5.00
RECEIVERS		R6	34.4	34.0	40.6	55.0	50.0	0.0				5.00	a	5933764.97	2258138.50	5.00

Point Source(s)

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			K0	Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night				X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(dB)	(ft)		(ft)	(ft)	(ft)
POINTSOURCE		TRASH10	89.0	89.0	89.0	Lw	89.0		150.00	0.00	90.00	0.0	5.00	a	5935444.41	2261642.02	5.00
POINTSOURCE		TRASH09	89.0	89.0	89.0	Lw	89.0		150.00	0.00	90.00	0.0	5.00	a	5935400.93	2261642.33	5.00
POINTSOURCE		TRASH08	89.0	89.0	89.0	Lw	89.0		150.00	0.00	90.00	0.0	5.00	a	5935202.48	2261244.54	5.00
POINTSOURCE		TRASH07	89.0	89.0	89.0	Lw	89.0		150.00	0.00	90.00	0.0	5.00	a	5935194.24	2260853.05	5.00
POINTSOURCE		TRASH06	89.0	89.0	89.0	Lw	89.0		150.00	0.00	90.00	0.0	5.00	a	5935945.69	2261878.21	5.00
POINTSOURCE		TRASH05	89.0	89.0	89.0	Lw	89.0		150.00	0.00	90.00	0.0	5.00	a	5935944.90	2261554.10	5.00
POINTSOURCE		TRASH04	89.0	89.0	89.0	Lw	89.0		150.00	0.00	90.00	0.0	5.00	a	5935998.97	2261230.12	5.00
POINTSOURCE		TRASH03	89.0	89.0	89.0	Lw	89.0		150.00	0.00	90.00	0.0	5.00	a	5935989.52	2260839.40	5.00
POINTSOURCE		TRASH02	89.0	89.0	89.0	Lw	89.0		150.00	0.00	90.00	0.0	5.00	a	5935400.90	2261877.91	5.00
POINTSOURCE		TRASH01	89.0	89.0	89.0	Lw	89.0		150.00	0.00	90.00	0.0	5.00	a	5935454.40	2261878.40	5.00

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			K0	Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night				X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(dB)	(ft)		(ft)	(ft)	(ft)
POINTSOURCE		AC01	88.9	88.9	88.9	Lw	88.9		585.00	0.00	252.00	0.0	5.00	g	5936264.01	2261301.48	50.00
POINTSOURCE		AC02	88.9	88.9	88.9	Lw	88.9		585.00	0.00	252.00	0.0	5.00	g	5934912.80	2261326.21	50.00
POINTSOURCE		AC03	88.9	88.9	88.9	Lw	88.9		585.00	0.00	252.00	0.0	5.00	g	5936251.30	2260758.12	50.00
POINTSOURCE		AC04	88.9	88.9	88.9	Lw	88.9		585.00	0.00	252.00	0.0	5.00	g	5934900.12	2260785.04	50.00
POINTSOURCE		AC05	88.9	88.9	88.9	Lw	88.9		585.00	0.00	252.00	0.0	5.00	g	5936263.27	2261927.73	50.00
POINTSOURCE		AC06	88.9	88.9	88.9	Lw	88.9		585.00	0.00	252.00	0.0	5.00	g	5935584.02	2261954.28	50.00
POINTSOURCE		AC07	88.9	88.9	88.9	Lw	88.9		585.00	0.00	252.00	0.0	5.00	g	5935095.55	2261965.89	50.00
POINTSOURCE		PARK01	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5936093.08	2260690.53	5.00
POINTSOURCE		PARK02	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5936175.74	2260689.15	5.00
POINTSOURCE		PARK03	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5936268.55	2260689.29	5.00
POINTSOURCE		PARK04	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5936281.54	2261367.41	5.00
POINTSOURCE		PARK05	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5936193.82	2261368.87	5.00
POINTSOURCE		PARK06	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5936109.45	2261368.59	5.00
POINTSOURCE		PARK07	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5934926.03	2261538.50	5.00
POINTSOURCE		PARK08	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5934925.89	2261631.31	5.00
POINTSOURCE		PARK09	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5935088.99	2261394.04	5.00
POINTSOURCE		PARK10	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5934987.78	2261395.73	5.00
POINTSOURCE		PARK11	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5934903.43	2261397.14	5.00
POINTSOURCE		PARK12	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5935083.62	2260666.86	5.00
POINTSOURCE		PARK13	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5934984.48	2260692.14	5.00
POINTSOURCE		PARK14	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5934824.81	2260831.48	5.00
POINTSOURCE		PARK15	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5934829.51	2260910.71	5.00
POINTSOURCE		PARK16	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5934825.80	2260991.77	5.00
POINTSOURCE		PARK17	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5934826.11	2261111.57	5.00
POINTSOURCE		PARK18	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5934827.60	2261200.97	5.00
POINTSOURCE		PARK19	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5934832.38	2261285.26	5.00
POINTSOURCE		PARK20	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5936351.32	2260795.90	5.00
POINTSOURCE		PARK21	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5936347.86	2260892.14	5.00
POINTSOURCE		PARK22	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5936345.84	2260973.17	5.00
POINTSOURCE		PARK23	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5936352.87	2261091.17	5.00
POINTSOURCE		PARK24	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5936360.80	2261209.25	5.00
POINTSOURCE		PARK25	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5936358.64	2261330.31	5.00
POINTSOURCE		PARK26	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5935885.24	2261845.22	5.00
POINTSOURCE		PARK27	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5935880.86	2261707.59	5.00
POINTSOURCE		PARK28	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5935881.31	2261609.51	5.00
POINTSOURCE		PARK29	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5936108.92	2261495.13	5.00
POINTSOURCE		PARK30	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5936219.41	2261489.12	5.00
POINTSOURCE		PARK31	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5936357.46	2261634.96	5.00
POINTSOURCE		PARK32	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5936368.38	2261789.18	5.00
POINTSOURCE		PARK33	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5936371.58	2261855.89	5.00
POINTSOURCE		PARK34	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5936369.15	2261960.26	5.00
POINTSOURCE		PARK35	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5936228.38	2262027.29	5.00
POINTSOURCE		PARK36	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5936157.46	2262028.47	5.00
POINTSOURCE		PARK37	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5936076.11	2262029.83	5.00
POINTSOURCE		PARK38	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5935986.45	2262033.41	5.00
POINTSOURCE		PARK39	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5935283.45	2262043.04	5.00
POINTSOURCE		PARK40	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5935187.50	2262044.64	5.00
POINTSOURCE		PARK41	87.8	87.8	87.8	Lw	87.8		900.00	0.00	540.00	0.0	5.00	a	5935095.79	2262050.35	5.00

Line Source(s)

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Operating Time			Moving Pt. Src				Height
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	Number			Speed	
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	Day	Evening	Night	(mph)	(ft)
LINESOURCE		TRUCK01	93.2	93.2	93.2	74.6	74.6	74.6	Lw	93.2		900.00	0.00	540.00					8
LINESOURCE		TRUCK02	93.2	93.2	93.2	70.8	70.8	70.8	Lw	93.2		900.00	0.00	540.00					8
LINESOURCE		TRUCK03	93.2	93.2	93.2	71.6	71.6	71.6	Lw	93.2		900.00	0.00	540.00					8
LINESOURCE		TRUCK04	93.2	93.2	93.2	76.0	76.0	76.0	Lw	93.2		900.00	0.00	540.00					8
LINESOURCE		TRUCK05	93.2	93.2	93.2	70.2	70.2	70.2	Lw	93.2		900.00	0.00	540.00					8
LINESOURCE		TRUCK06	93.2	93.2	93.2	74.5	74.5	74.5	Lw	93.2		900.00	0.00	540.00					8
LINESOURCE		TRUCK07	93.2	93.2	93.2	72.5	72.5	72.5	Lw	93.2		900.00	0.00	540.00					8
LINESOURCE		TRUCK08	93.2	93.2	93.2	69.9	69.9	69.9	Lw	93.2		900.00	0.00	540.00					8
LINESOURCE		TRUCK09	93.2	93.2	93.2	75.2	75.2	75.2	Lw	93.2		900.00	0.00	540.00					8
LINESOURCE		TRUCK10	93.2	93.2	93.2	76.2	76.2	76.2	Lw	93.2		900.00	0.00	540.00					8
LINESOURCE		TRUCK11	93.2	93.2	93.2	75.9	75.9	75.9	Lw	93.2		900.00	0.00	540.00					8
LINESOURCE		TRUCK12	93.2	93.2	93.2	71.9	71.9	71.9	Lw	93.2		900.00	0.00	540.00					8

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
LINESOURCE	8.00	a			5935174.83	2260843.83	8.00	0.00
					5935166.22	2260608.94	8.00	0.00
LINESOURCE	8.00	a			5935184.00	2261258.60	8.00	0.00
					5935186.28	2261439.88	8.00	0.00
					5934792.59	2261445.65	8.00	0.00
LINESOURCE	8.00	a			5935372.45	2261631.91	8.00	0.00
					5935371.77	2261507.28	8.00	0.00

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
					5935418.23	2261505.73	8.00	0.00
					5935420.25	2261441.40	8.00	0.00
					5935186.28	2261439.88	8.00	0.00
LINESOURCE	8.00	a			5935470.63	2261630.73	8.00	0.00
					5935467.85	2261508.00	8.00	0.00
					5935418.23	2261505.73	8.00	0.00
LINESOURCE	8.00	a			5935964.95	2261540.49	8.00	0.00
					5935963.86	2261428.46	8.00	0.00
					5935420.25	2261441.40	8.00	0.00
LINESOURCE	8.00	a			5936017.31	2261241.93	8.00	0.00
					5936020.40	2261427.52	8.00	0.00
					5935963.86	2261428.46	8.00	0.00
LINESOURCE	8.00	a			5936020.40	2261427.52	8.00	0.00
					5936409.72	2261420.30	8.00	0.00
LINESOURCE	8.00	a			5935931.51	2261868.60	8.00	0.00
					5935907.06	2261870.75	8.00	0.00
					5935896.71	2261876.73	8.00	0.00
					5935892.81	2261886.66	8.00	0.00
					5935888.31	2261895.44	8.00	0.00
					5935890.57	2262031.26	8.00	0.00
					5935430.37	2262042.41	8.00	0.00
					5935428.97	2262096.83	8.00	0.00
LINESOURCE	8.00	a			5935476.62	2261889.95	8.00	0.00
					5935479.65	2262003.28	8.00	0.00
					5935428.00	2262004.72	8.00	0.00
					5935430.25	2262047.22	8.00	0.00
LINESOURCE	8.00	a			5935373.85	2261892.27	8.00	0.00
					5935375.17	2262004.44	8.00	0.00
					5935428.00	2262004.72	8.00	0.00
LINESOURCE	8.00	a			5936009.22	2260827.64	8.00	0.00
					5936009.49	2260652.14	8.00	0.00
LINESOURCE	8.00	a			5935371.77	2261507.28	8.00	0.00
					5934994.74	2261511.23	8.00	0.00
					5934993.59	2261442.70	8.00	0.00

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Operating Time			Height
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	(ft)
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	
AREASOURCE		DOCK01	103.4	103.4	103.4	68.3	68.3	68.3	Lw	103.4					8
AREASOURCE		DOCK02	103.4	103.4	103.4	68.3	68.3	68.3	Lw	103.4					8
AREASOURCE		DOCK03	103.4	103.4	103.4	66.8	66.8	66.8	Lw	103.4					8
AREASOURCE		DOCK04	103.4	103.4	103.4	66.2	66.2	66.2	Lw	103.4					8
AREASOURCE		DOCK05	103.4	103.4	103.4	66.2	66.2	66.2	Lw	103.4					8

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
AREASOURCE	8.00	a			5935287.55	2261894.08	8.00	0.00
					5935332.73	2261892.70	8.00	0.00
					5935420.83	2261891.78	8.00	0.00
					5935415.94	2261629.73	8.00	0.00
					5935327.16	2261634.17	8.00	0.00
					5935282.57	2261633.03	8.00	0.00
AREASOURCE	8.00	a			5935563.09	2261628.35	8.00	0.00
					5935517.92	2261630.36	8.00	0.00
					5935428.25	2261631.06	8.00	0.00
					5935432.09	2261891.60	8.00	0.00
					5935521.60	2261888.29	8.00	0.00
					5935566.78	2261887.54	8.00	0.00
AREASOURCE	8.00	a			5936074.03	2261891.01	8.00	0.00
					5936067.54	2261539.60	8.00	0.00
					5935927.47	2261540.82	8.00	0.00
					5935931.82	2261893.50	8.00	0.00
					5935952.93	2261893.66	8.00	0.00
AREASOURCE	8.00	a			5936114.04	2261241.28	8.00	0.00
					5936107.13	2260826.48	8.00	0.00
					5936046.24	2260826.87	8.00	0.00
					5935970.89	2260828.44	8.00	0.00
					5935978.32	2261243.53	8.00	0.00
					5936055.02	2261240.38	8.00	0.00
AREASOURCE	8.00	a			5935082.38	2261259.11	8.00	0.00
					5935141.48	2261259.02	8.00	0.00
					5935217.24	2261258.27	8.00	0.00
					5935209.30	2260843.18	8.00	0.00
					5935133.84	2260844.59	8.00	0.00

Name	Height		Coordinates			
	Begin	End	x	y	z	Ground
	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
			5935074.21	2260844.33	8.00	0.00

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)

Building(s)

Name	M.	ID	RB	Residents	Absorption	Height		Coordinates			
						Begin		x	y	z	Ground
						(ft)		(ft)	(ft)	(ft)	(ft)
BUILDING		BUILDING00001	x	0		45.00	a	5935055.92	2262006.54	45.00	0.00
								5935334.55	2262001.89	45.00	0.00
								5935332.73	2261892.70	45.00	0.00
								5935287.55	2261894.08	45.00	0.00
								5935282.57	2261633.03	45.00	0.00
								5935327.16	2261634.17	45.00	0.00
								5935326.07	2261531.24	45.00	0.00
								5935046.82	2261535.90	45.00	0.00
								5935049.16	2261638.81	45.00	0.00
								5935037.85	2261638.37	45.00	0.00
								5935040.29	2261897.57	45.00	0.00
								5935054.10	2261897.34	45.00	0.00
BUILDING		BUILDING00002	x	0		45.00	a	5935524.66	2261996.84	45.00	0.00
								5935780.71	2261993.19	45.00	0.00
								5935781.07	2261977.50	45.00	0.00
								5935804.28	2261976.48	45.00	0.00
								5935804.74	2261966.43	45.00	0.00
								5935834.85	2261965.30	45.00	0.00
								5935834.62	2261951.49	45.00	0.00
								5935858.48	2261951.72	45.00	0.00
								5935858.44	2261949.21	45.00	0.00
								5935847.13	2261948.78	45.00	0.00
								5935846.12	2261925.57	45.00	0.00
								5935842.34	2261925.00	45.00	0.00
								5935839.21	2261624.38	45.00	0.00
								5935827.91	2261623.94	45.00	0.00
								5935825.58	2261522.29	45.00	0.00
								5935515.58	2261527.46	45.00	0.00
								5935517.92	2261630.36	45.00	0.00
								5935563.09	2261628.35	45.00	0.00
								5935566.78	2261887.54	45.00	0.00
								5935521.60	2261888.29	45.00	0.00
BUILDING		BUILDING00003	x	0		45.00	a	5935953.80	2261946.37	45.00	0.00
								5935941.89	2261947.20	45.00	0.00
								5935942.57	2261950.32	45.00	0.00
								5935965.16	2261949.95	45.00	0.00
								5935965.41	2261965.01	45.00	0.00
								5935971.70	2261965.53	45.00	0.00
								5935971.63	2261961.14	45.00	0.00
								5935996.09	2261960.10	45.00	0.00
								5935996.96	2261974.52	45.00	0.00
								5936021.40	2261972.23	45.00	0.00
								5936022.89	2261986.02	45.00	0.00
								5936112.63	2261984.52	45.00	0.00
								5936113.18	2261980.12	45.00	0.00
								5936178.45	2261979.66	45.00	0.00
								5936177.89	2261983.43	45.00	0.00
								5936255.71	2261982.76	45.00	0.00
								5936256.91	2261978.98	45.00	0.00
								5936302.71	2261977.59	45.00	0.00
								5936303.55	2261990.75	45.00	0.00
								5936306.06	2261990.71	45.00	0.00
								5936305.08	2261969.39	45.00	0.00
								5936317.03	2261970.44	45.00	0.00
								5936316.27	2261849.93	45.00	0.00
								5936320.64	2261848.61	45.00	0.00
								5936318.63	2261765.78	45.00	0.00
								5936311.74	2261766.52	45.00	0.00
								5936310.67	2261702.51	45.00	0.00
								5936307.54	2261702.57	45.00	0.00
								5936305.50	2261542.53	45.00	0.00
								5936292.95	2261542.74	45.00	0.00
								5936292.14	2261532.08	45.00	0.00
								5936238.16	2261532.36	45.00	0.00

Name	M.	ID	RB	Residents	Absorption	Height		Coordinates			
						Begin		x	y	z	Ground
						(ft)		(ft)	(ft)	(ft)	(ft)
								5936237.61	2261536.76	45.00	0.00
								5936067.54	2261539.60	45.00	0.00
								5936074.03	2261891.01	45.00	0.00
								5935952.93	2261893.66	45.00	0.00
BUILDING		BUILDING00004	x	0		45.00	a	5934874.92	2261353.59	45.00	0.00
								5934889.36	2261353.35	45.00	0.00
								5934889.55	2261365.27	45.00	0.00
								5935144.34	2261361.03	45.00	0.00
								5935141.48	2261259.02	45.00	0.00
								5935082.38	2261259.11	45.00	0.00
								5935074.21	2260844.33	45.00	0.00
								5935133.84	2260844.59	45.00	0.00
								5935132.12	2260741.05	45.00	0.00
								5934878.59	2260745.27	45.00	0.00
								5934878.18	2260758.46	45.00	0.00
								5934866.26	2260758.66	45.00	0.00
BUILDING		BUILDING00005	x	0		45.00	a	5936056.11	2261343.31	45.00	0.00
								5936298.34	2261339.27	45.00	0.00
								5936298.13	2261326.72	45.00	0.00
								5936310.68	2261326.51	45.00	0.00
								5936300.16	2260732.87	45.00	0.00
								5936286.96	2260731.84	45.00	0.00
								5936286.77	2260720.54	45.00	0.00
								5936044.58	2260727.09	45.00	0.00
								5936046.24	2260826.87	45.00	0.00
								5936107.13	2260826.48	45.00	0.00
								5936114.04	2261241.28	45.00	0.00
								5936055.02	2261240.38	45.00	0.00

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APPENDIX 10.1:

CADNAA CONSTRUCTION NOISE MODEL INPUTS

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14092 -Torrance Commerce Center Phase 3

CadnaA Noise Prediction Model: 14092_03 - Construction.cna
Date: 16.12.21
Analyst: S. Shami

Calculation Configuration

Configuration	
Parameter	Value
General	
Country	(user defined)
Max. Error (dB)	0.00
Max. Search Radius (#(Unit,LEN))	2000.01
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (#(Unit,LEN))	999.99
Min. Length of Section (#(Unit,LEN))	1.01
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	960.00
Reference Time Night (min)	480.00
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	5.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	2
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rvcr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Incl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (#(Unit,TEMP))	10
rel. Humidity (%)	70
Ground Absorption G	0.50
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (RLS-90)	
Strictly acc. to RLS-90	
Railways (FTA/FRA)	
Aircraft (???)	
Strictly acc. to AzB	

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Night	CNEL	Day	Night	CNEL	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
RECEIVERS		R1	48.9	48.9	55.6	55.0	50.0	0.0				5.00	a	5934062.05	2262231.34	5.00
RECEIVERS		R2	52.0	52.0	58.6	55.0	50.0	0.0				5.00	a	5934558.43	2262223.03	5.00
RECEIVERS		R3	55.9	55.9	62.6	55.0	50.0	0.0				5.00	a	5935686.07	2262311.98	5.00
RECEIVERS		R4	44.5	44.5	51.1	55.0	50.0	0.0				5.00	a	5938301.21	2261189.91	5.00
RECEIVERS		R5	41.4	41.4	48.1	55.0	50.0	0.0				5.00	a	5936569.28	2258085.61	5.00
RECEIVERS		R6	40.6	40.6	47.3	55.0	50.0	0.0				5.00	a	5933764.97	2258138.50	5.00

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL"			Lw / Li			Operating Time			Height
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	(ft)
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	
SITEBOUNDARY		CONSTRUCTION	115.0	115.0	115.0	63.0	63.0	63.0	Lw	115					8

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
SITEBOUNDARY	8.00	a			5934978.03	2262077.03	8.00	0.00
					5934978.32	2262083.68	8.00	0.00
					5934980.11	2262090.17	8.00	0.00
					5934985.46	2262098.06	8.00	0.00
					5934993.07	2262103.24	8.00	0.00

Name	Height		Coordinates			
	Begin	End	x	y	z	Ground
	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
			5935003.60	2262105.33	8.00	0.00
			5936098.57	2262083.46	8.00	0.00
			5936214.54	2262069.20	8.00	0.00
			5936391.94	2262064.73	8.00	0.00
			5936408.28	2262060.68	8.00	0.00
			5936422.18	2262050.02	8.00	0.00
			5936432.21	2262022.11	8.00	0.00
			5936427.46	2261993.21	8.00	0.00
			5936417.75	2261928.17	8.00	0.00
			5936409.15	2261818.35	8.00	0.00
			5936411.45	2261683.14	8.00	0.00
			5936409.62	2261405.21	8.00	0.00
			5936401.66	2260943.62	8.00	0.00
			5936386.97	2260886.41	8.00	0.00
			5936383.89	2260694.36	8.00	0.00
			5936341.48	2260652.76	8.00	0.00
			5936159.40	2260658.24	8.00	0.00
			5936083.81	2260658.75	8.00	0.00
			5936057.21	2260657.33	8.00	0.00
			5936022.36	2260654.54	8.00	0.00
			5935957.78	2260642.52	8.00	0.00
			5935969.24	2261374.39	8.00	0.00
			5935933.34	2261376.11	8.00	0.00
			5935933.48	2261362.26	8.00	0.00
			5935898.68	2261362.46	8.00	0.00
			5935897.83	2261401.78	8.00	0.00
			5935252.00	2261410.30	8.00	0.00
			5935248.12	2261267.39	8.00	0.00
			5935227.83	2261267.36	8.00	0.00
			5935219.04	2260607.04	8.00	0.00
			5935176.49	2260607.86	8.00	0.00
			5935128.29	2260612.93	8.00	0.00
			5935070.13	2260626.25	8.00	0.00
			5934981.87	2260652.80	8.00	0.00
			5934917.00	2260667.73	8.00	0.00
			5934865.46	2260674.20	8.00	0.00
			5934825.41	2260674.12	8.00	0.00
			5934804.48	2260675.59	8.00	0.00
			5934794.80	2260678.75	8.00	0.00
			5934786.70	2260687.12	8.00	0.00
			5934783.90	2260698.77	8.00	0.00
			5934777.98	2260701.03	8.00	0.00
			5934792.74	2261453.27	8.00	0.00
			5934799.34	2261505.36	8.00	0.00
			5934819.02	2261571.32	8.00	0.00
			5934842.22	2261618.78	8.00	0.00
			5934921.25	2261755.04	8.00	0.00
			5934941.08	2261795.44	8.00	0.00
			5934958.73	2261844.88	8.00	0.00
			5934968.78	2261887.67	8.00	0.00
			5934973.22	2261918.43	8.00	0.00
			5934975.60	2261955.86	8.00	0.00