Stoneridge Commerce Center Specific Plan

NOISE AND VIBRATION ANALYSIS
COUNTY OF RIVERSIDE

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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	Stoneridge Commerce Center Specific Plan
REMEL	Reference Energy Mean Emission Level
RMS	Root-mean-square
VdB	Vibration Decibels

EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to determine the noise exposure and the necessary noise mitigation measures for the proposed Stoneridge Commerce Center Specific Plan development ("Project"). The Project site is located west of Lakeview Avenue, between Ramona Expressway and Nuevo Road in the County of Riverside. The Project is proposing to amend the Specific Plan with a mix of industrial and commercial uses. This noise study has been prepared to satisfy applicable County of Riverside noise standards and significance criteria based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1)

The results of this Noise and Vibration Analysis are summarized below based on the significance criteria in Section 4 of this report consistent with Appendix G of the 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	*Potentially Significant*	*Significant and Unavoidable*
Operational Noise	9	*Potentially Significant*	*Less Than Significant*
Construction Noise	10	*Less Than Significant*	-
Nighttime Concrete Pour		*Less Than Significant*	-
Construction Vibration		*Less Than Significant*	-
Blasting Noise		*Less Than Significant*	-
Blasting 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 Stoneridge Commerce Center Specific Plan ("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 proposed Project is located west of Lakeview Avenue, between Ramona Expressway and Nuevo Road in the County of Riverside, as shown on Exhibit 1-A.

1.2 PROJECT DESCRIPTION

The Project is proposing to amend the Specific Plan with a mix of industrial and commercial uses, with an opening year of 2032. This analysis evaluates two scenarios, Without Mid-County Parkway (MCP) as shown on Exhibit 1-B and With MCP as shown on Exhibit 1-C, as described below:

Without MCP:

- 2,940,000 square feet of High-Cube Cold Storage Warehouse use (40% of the total Light Industrial square footage)
- 2,940,000 square feet of High-Cube Fulfillment Center Warehouse use (40% of the total Light Industrial square footage)
- 735,000 square feet of High-Cube Warehouse use (10% of the total Light Industrial square footage)
- 735,000 square feet of Manufacturing use (10% of the total Light Industrial square footage)
- 427,759 square feet of Warehousing use (40% of the total Business Park square footage)
- 641,639 square feet of Industrial Park use (60% of the total Business Park square footage)
- 121,968 square feet of Commercial Retail uses

With MCP:

- 2,940,000 square feet of High-Cube Cold Storage Warehouse use (40% of the total Light Industrial square footage)
- 2,940,000 square feet of High-Cube Fulfillment Center Warehouse use (40% of the total Light Industrial square footage)
- 735,000 square feet of High-Cube Warehouse use (10% of the total Light Industrial square footage)
- 735,000 square feet of Manufacturing use (10% of the total Light Industrial square footage)
- 374,616 square feet of Warehousing use (40% of the total Business Park square footage)
- 561,924 square feet of Industrial Park use (60% of the total Business Park square footage)
- 126,542 square feet of Commercial Retail uses

As summarized in the *Stoneridge Commerce Center Specific Plan Traffic Impact Analysis* prepared by Urban Crossroads, Inc., the Without MCP scenario is expected to generate a total of approximately 23,680 two-way trips per day which include 19,236 two-way passenger car trips

per day and 4,444 two-way truck trips per day. Under the With MCP scenario, the Project is anticipated to generate a total of 23,474 two-way trips per day which include 19,108 two-way passenger vehicle trips per day and 4,366 two-way truck trips per day. (2) 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, truck movements, and drive-through speakerphone activity. This noise analysis is intended to describe the noise level impacts associated with the expected typical operational activities at the Project site.

EXHIBIT 1-A: LOCATION MAP

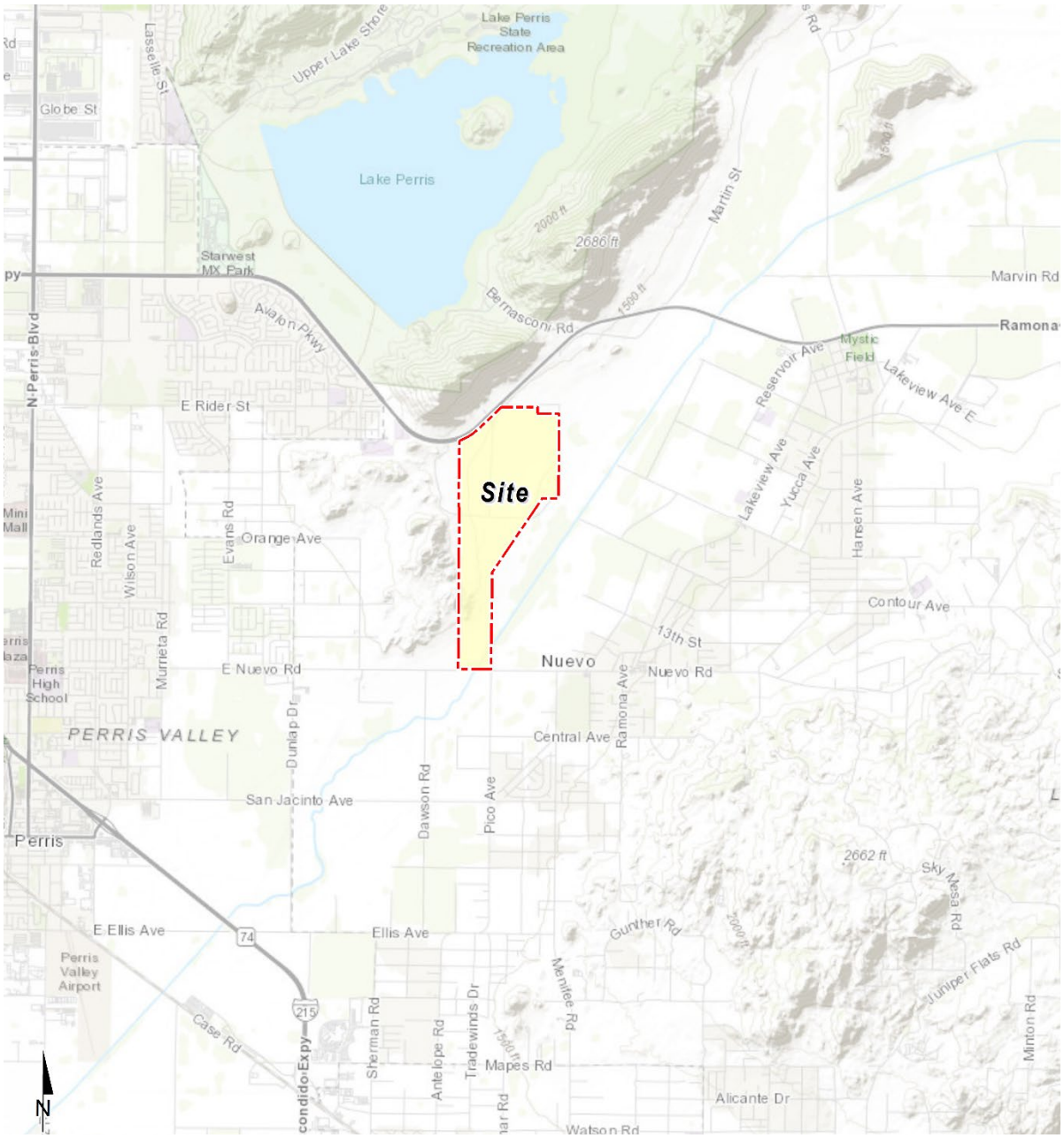


EXHIBIT 1-B: PRELIMINARY LAND USE PLAN WITHOUT MID-COUNTY PARKWAY

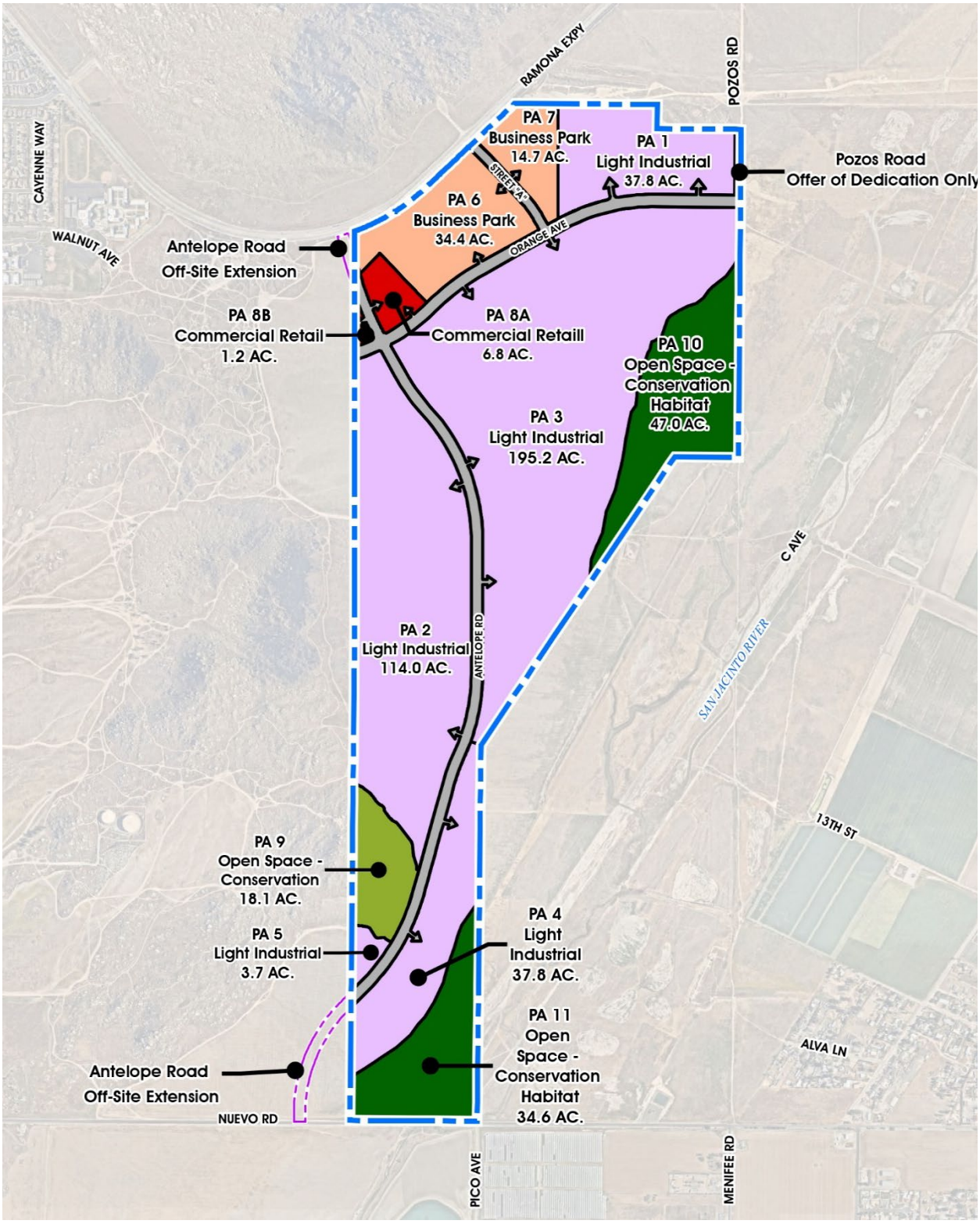
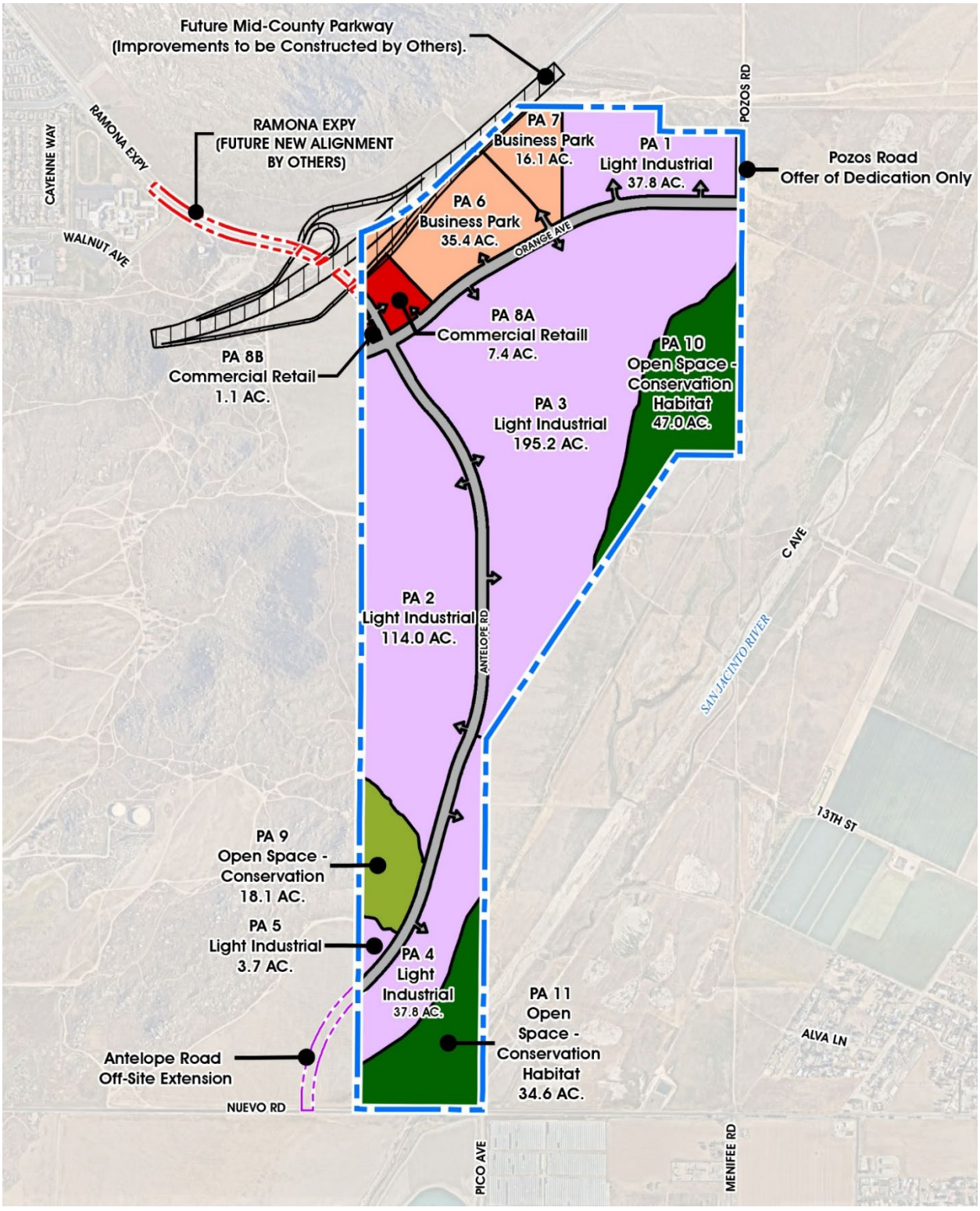


EXHIBIT 1-C: PRELIMINARY LAND USE PLAN WITH MID-COUNTY PARKWAY



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. (3) 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. (4) 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 County of Riverside 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. (3)

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. (5)

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. (3)

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. (6)

2.4 NOISE CONTROL

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

2.5 NOISE BARRIER ATTENUATION

Effective noise barriers can reduce noise levels by 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

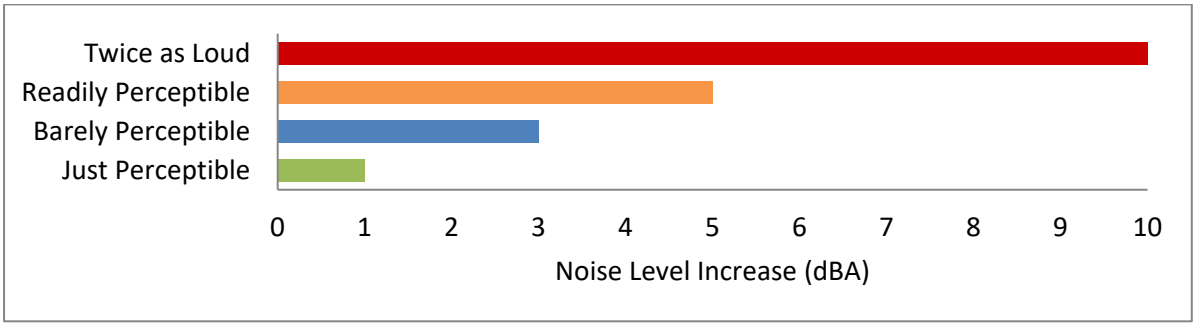
Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches, and residences are more sensitive to noise intrusion than are commercial or industrial developments and related activities. As ambient noise levels affect the perceived amenity or livability of a development, 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. (7)

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. (8 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. (9) According to research originally published in the Noise Effects Handbook (8), 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. (5)

EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION



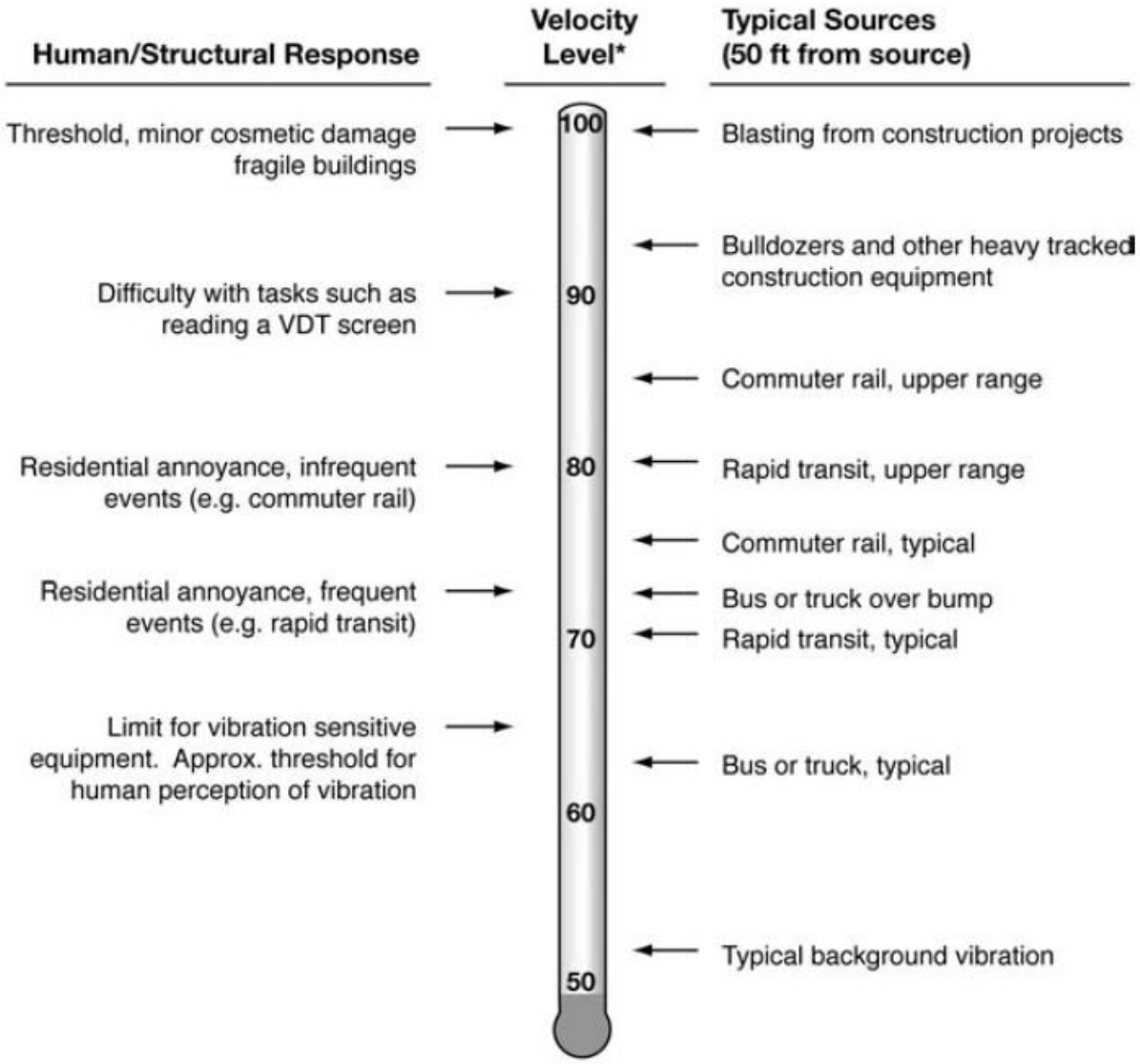
2.8 VIBRATION

Per the Federal Transit Administration (FTA) *Transit Noise Impact and Vibration Impact Assessment Manual* (9) , 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

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

3.1 STATE OF CALIFORNIA NOISE REQUIREMENTS

The State of California regulates freeway noise, sets standards for sound transmission, provides occupational noise control criteria, identifies noise standards, and provides guidance for local land use compatibility. State law requires that each county and city adopt a General Plan that includes a Noise Element which is to be prepared per guidelines adopted by the Governor's Office of Planning and Research (OPR). (10) The purpose of the Noise Element is to *limit the exposure of the community to excessive noise levels*. In addition, the California Environmental Quality Act (CEQA) requires that all known environmental effects of a project be analyzed, including environmental noise impacts.

3.2 COUNTY OF RIVERSIDE GENERAL PLAN NOISE ELEMENT

The County of Riverside has adopted a Noise Element of the General Plan to control and abate environmental noise, and to protect the citizens of the County of Riverside from excessive exposure to noise. (11) The Noise Element specifies the maximum allowable exterior noise levels for new developments impacted by transportation noise sources such as arterial roads, freeways, airports, and railroads. In addition, the Noise Element identifies several polices to minimize the impacts of excessive noise levels throughout the community and establishes noise level requirements for all land uses. To protect County of Riverside residents from excessive noise, the Noise Element contains the following policies related to the Project:

N 1.1 Protect noise-sensitive land uses from high levels of noise by restricting noise-producing land uses from these areas. If the noise-producing land use cannot be relocated, then noise buffers such as setbacks, landscaping, or block walls shall be used.

N 1.3 Consider the following uses noise-sensitive and discourage these uses in areas in excess of 65 CNEL:

- *Schools*
- *Hospitals*
- *Rest Homes*
- *Long Term Care Facilities*
- *Mental Care Facilities*
- *Residential Uses*
- *Libraries*

- *Passive Recreation Uses*
- *Places of Worship*

N 1.5 Prevent and mitigate the adverse impacts of excessive noise exposure on the residents, employees, visitors, and noise-sensitive uses of Riverside County.

N 4.1 Prohibit facility-related noise, received by any sensitive use, from exceeding the following worst-case noise levels:

a. 45 dBA 9-minute L_{eq} between 10:00 p.m. and 7:00 a.m.;

b. 65 dBA 9-minute L_{eq} between 7:00 a.m. and 10:00 p.m.

N 13.1 Minimize the impacts of construction noise on adjacent uses within acceptable standards.

N 13.2 Ensure that construction activities are regulated to establish hours of operation in order to prevent and/or mitigate the generation of excessive or adverse impacts on surrounding areas.

N 13.3 Condition subdivision approval adjacent to developed/occupied noise-sensitive land uses (see policy N 1.3) by requiring the developer to submit a construction-related noise mitigation plan to the [County] for review and approval prior to issuance of a grading permit. The plan must depict the location of construction equipment and how the noise from this equipment will be mitigated during construction of this project, through the use of such methods as:

i. Temporary noise attenuation fences;

ii. Preferential location and equipment; and

iii. Use of current noise suppression technology and equipment.

N 14.1 Enforce the California Building Standards that sets standards for building construction to mitigate interior noise levels to the tolerable 45 CNEL limit. These standards are utilized in conjunction with the Uniform Building Code by the County's Building Department to ensure that noise protection is provided to the public. Some design features may include extra-dense insulation, double-paned windows, and dense construction materials.

N 16.3 Prohibit exposure of residential dwellings to perceptible ground vibration from passing trains as perceived at the ground or second floor. Perceptible motion shall be presumed to be a motion velocity of 0.01 inches/second over a range of 1 to 100 Hz.

To ensure noise-sensitive land uses are protected from high levels of noise (N 1.1), Table N-1 of the Noise Element identifies guidelines to evaluate proposed developments based on exterior and interior noise level limits for land uses and requires a noise analysis to determine needed mitigation measures if necessary. The Noise Element identifies residential use as noise-sensitive land use (N 1.3) and discourages new development in areas with transportation related levels of 65 dBA CNEL or greater existing ambient noise levels. To prevent and mitigate noise impacts for its residents (N 1.5), County of Riverside requires exterior noise attenuation measures for sensitive land use exposed to transportation related noise levels higher than 65 dBA CNEL. In addition, the County of Riverside had adopted an interior noise level limit of 45 dBA CNEL (N 14.1).

Policy N 4.1 of the Noise Element sets a stationary-source exterior noise limit to not to be exceeded for a cumulative period of more than ten minutes in any hour of 65 dBA L_{eq} for daytime hours of 7:00 a.m. to 10:00 p.m., and 45 dBA L_{eq} during the noise-sensitive nighttime hours of 10:00 p.m. to 7:00 a.m. To prevent high levels of construction noise from impacting noise-

sensitive land uses, policies N 13.1 through 13.3 identify construction noise mitigation requirements for new development located near existing noise-sensitive land uses. (11)

3.2.1 LAND USE COMPATIBILITY GUIDELINES

The noise criteria identified in the County of Riverside Noise Element (Table N-1) are guidelines to evaluate the land use compatibility of transportation related noise. The compatibility criteria, shown on Exhibit 3-A, provides the County with a planning tool to gauge the compatibility of land uses relative to existing and future exterior noise levels.

The *Land Use Compatibility for Community Noise Exposure* matrix describes categories of compatibility and not specific noise standards. The warehouse/industrial use of the Project is considered *normally acceptable* with unmitigated exterior noise levels of less than 70 dBA CNEL based on the *Industrial, Manufacturing, Utilities, Agriculture* land use compatibility criteria shown on Exhibit 3-A. Residential designated land uses in the Project study area are considered *normally acceptable* with exterior noise levels below 60 dBA CNEL, and *conditionally acceptable* with exterior noise levels of up to 70 dBA CNEL. For *conditionally acceptable* exterior noise levels, of up to 80 dBA CNEL for Project land uses, *new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and the needed noise insulation features are included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice*. (11)

3.2.2 EXTERIOR STATIONARY SOURCE NOISE STANDARDS

The County of Riverside has set stationary-source hourly average L_{eq} exterior noise limits to control loading dock activity, roof-top air conditioning units, trash enclosure activity, parking lot vehicle movements, truck movements, and drive-through speakerphone activity associated with the development of the proposed Stoneridge Commerce Center Specific Plan. The County considers noise generated using motor vehicles to be a stationary noise source when operated on private property such as at a loading dock. These facility-related noises, as projected to any portion of any surrounding property containing a *habitable dwelling, hospital, school, library or nursing home*, must not exceed the following worst-case noise levels.

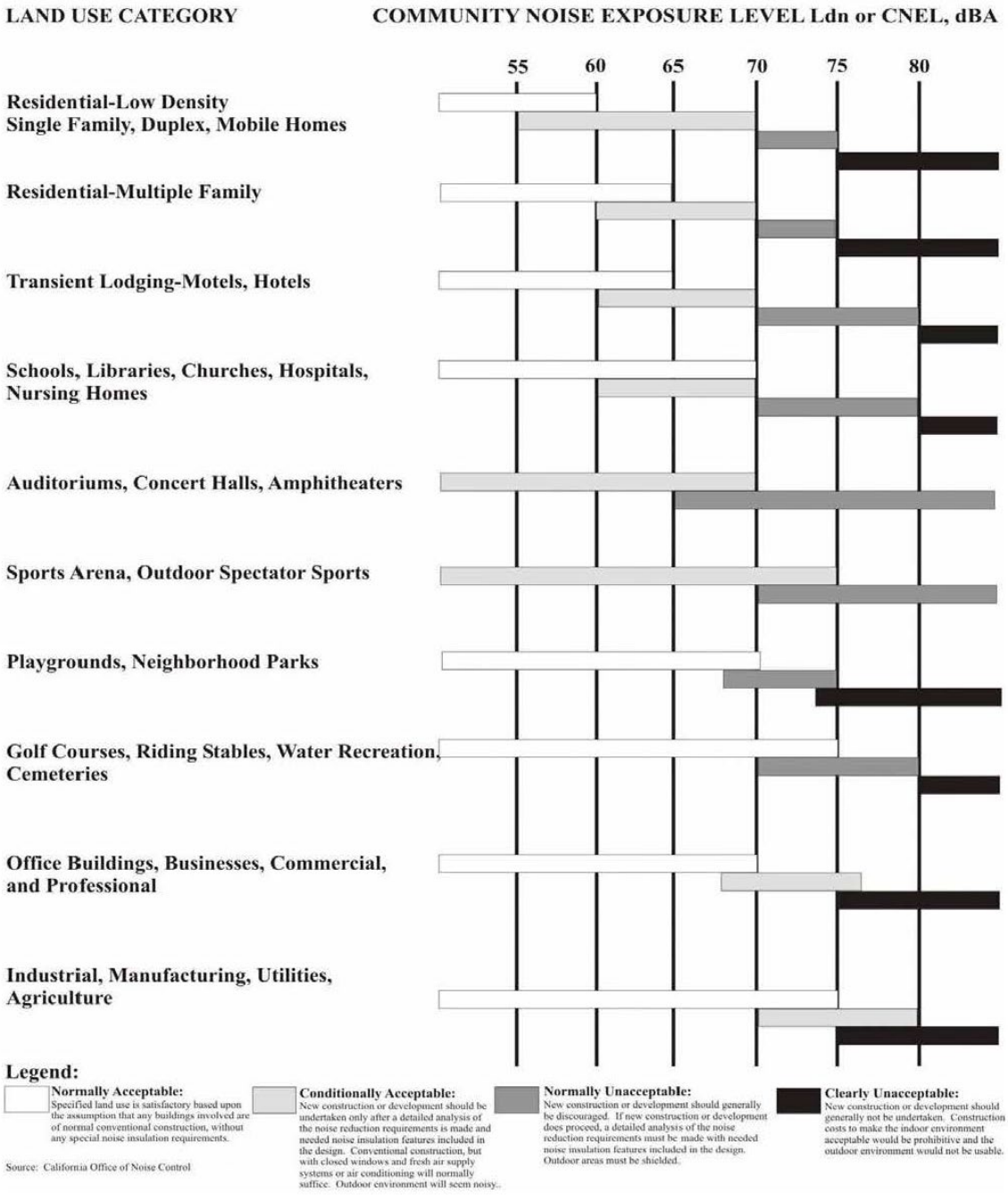
Policy N 4.1 of the County of Riverside General Plan Noise Element sets a stationary-source average L_{eq} exterior noise limit not to be exceeded for a cumulative period of more than ten minutes in any hour of 65 dBA L_{eq} for daytime hours of 7:00 a.m. to 10:00 p.m., and 45 dBA L_{eq} during the noise-sensitive nighttime hours of 10:00 p.m. to 7:00 a.m. (11)

3.2 CITY OF PERRIS GENERAL PLAN NOISE ELEMENT

The City of Perris has adopted a Noise Element of the General to evaluate the acceptability of the transportation related noise level impacts. (12) Like the County of Rivers, the City of Perris Land Use/Noise Compatibility are based on the Governor's Office of Planning and Research (OPR) and are used as guidelines to assess the long-term traffic noise impacts on land use. According to the City's Land Use/Noise Compatibility Guidelines (Exhibit N-1) presented on Exhibit 3-B, noise-sensitive land uses such as single-family residences are *normally acceptable* with exterior noise levels below 60 dBA CNEL and *conditionally acceptable* with noise levels below 65 dBA CNEL.

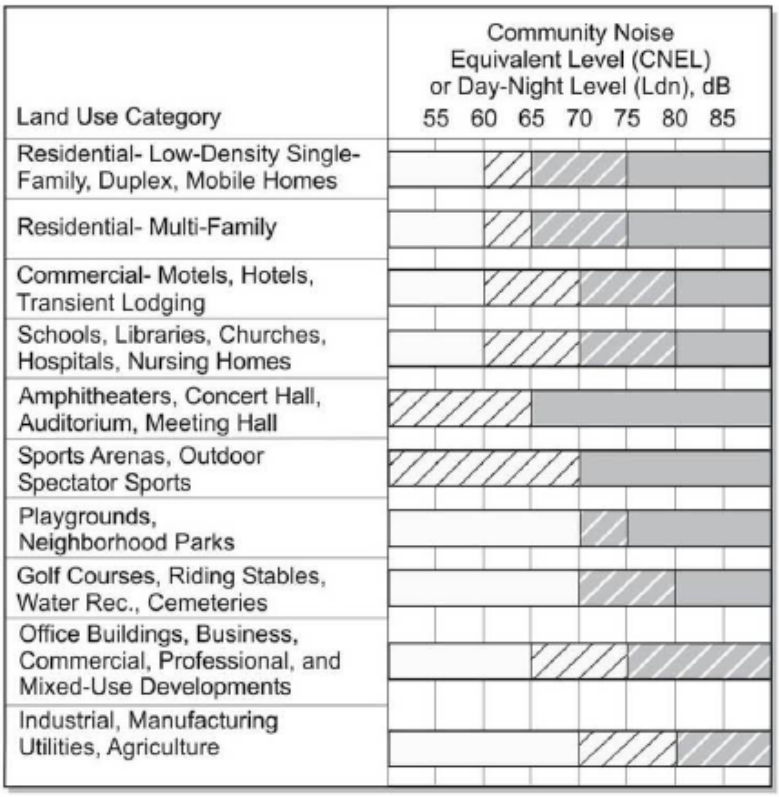
Commercial uses are *normally acceptable* with exterior noise levels below 65 dBA CNEL and *conditionally acceptable* with noise levels below 75 dBA CNEL. Industrial uses are considered *normally acceptable* with exterior noise levels of up to 70 dBA CNEL, and *conditionally acceptable* with exterior noise levels between 70 to 80 dBA CNEL (12).

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



Source: County of Riverside General Plan Noise Element, Table N-1.

EXHIBIT 3-B: LAND USE/NOISE COMPATIBILITY GUIDELINES



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

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

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

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

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

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

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

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

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

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

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

3.3 STATIONARY-SOURCE NOISE STANDARDS

To analyze noise impacts originating from a designated fixed location or private property such as the Stoneridge Commerce Center Specific Plan Project, stationary-source (operational) noise such as the expected loading dock activity, roof-top air conditioning units, trash enclosure activity, parking lot vehicle movements, truck movements, and drive-through speakerphone activity are typically evaluated against standards established under a jurisdiction's Municipal Code. The County of Riverside County Code Section 9.52.040 *General sound level standards* (included in Appendix 3.1) summarizing Ordinance No. 847 *Regulating Noise* identify lower, more restrictive exterior noise level standards, which for the purpose of this report, are used to evaluate potential Project-related operational noise level limits instead of the higher the General Plan exterior noise level standards previously identified. The County of Riverside County Code identifies residential exterior noise level limits of 55 dBA L_{eq} during the daytime hours of 7:00 a.m. to 10:00 p.m., and 45 dBA L_{eq} during the noise-sensitive nighttime hours of 10:00 p.m. to 7:00 a.m., commercial exterior noise level limits of 65 dBA L_{eq} during the daytime hours, and 55 dBA L_{eq} during the noise-sensitive nighttime hours, and public facility exterior noise level limits of 65 dBA L_{eq} during the daytime hours, and 45 dBA L_{eq} during the noise-sensitive nighttime hours. (13).

Based on several discussions with the County of Riverside Department of Environmental Health (DEH), Office of Industrial Hygiene (OIH), it is important to recognize that the County of Riverside County Code noise level standards, incorrectly identify maximum noise level (L_{max}) standards that should instead reflect the average L_{eq} noise levels. Moreover, the County of Riverside DEH OIH's April 15th, 2015, *Requirements for determining and mitigating, non-transportation noise source impacts to residential properties* also identifies operational (stationary source) noise level limits using the L_{eq} metric, consistent with the direction of the County of Riverside General Plan guidelines and standards provided in the Noise Element. Therefore, this report has been prepared consistent with direction of the County of Riverside DEH OIH guidelines and standards using the average L_{eq} noise level metric for stationary-source (operational) noise level evaluation.

3.4 CONSTRUCTION NOISE STANDARDS

Although the Project site is located within the County of Riverside, off-site noise-sensitive receivers potentially impacted by off-site construction noise activities are also located in the City of Perris. Therefore, this analysis presents the appropriate construction noise standards for both the County of Riverside and the City of Perris.

3.4.1 COUNTY OF RIVERSIDE CONSTRUCTION NOISE STANDARDS

To control noise impacts associated with the construction of the proposed Project, the County of Riverside has established limits to the hours of construction activities. Riverside County Ordinance No. 847 Regulating Noise Section 2i (Code Section 9.52.020[I]) indicates that noise associated with any private construction activity located within one-quarter of a mile from an inhabited dwelling is considered exempt between the hours of 6:00 a.m. and 6:00 p.m., during the months of June through September, and 7:00 a.m. and 6:00 p.m., during the months of October through May. (13) However, neither the County's General Plan nor County Code

establish numeric maximum acceptable construction source noise levels at potentially affected receivers for CEQA analysis purposes. 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 with a nighttime exterior construction noise level of 70 dBA L_{eq} (9 p. 179).

3.4.1 CITY OF PERRIS CONSTRUCTION NOISE STANDARDS

The City of Perris Municipal Code, Section 7.34.060, identifies the City's construction noise standards and limits construction activities to the hours of 7:00 a.m. to 7:00 p.m. on any day except Sundays and legal holidays (except for Columbus Day and Washington's birthday). The City of Perris Municipal Code, Section 7.34.060, noise level standard of 80 dBA L_{max} applies to residential zones within the City of Perris. (14) The L_{max} represents the maximum instantaneous sound level recorded during a given time period. It measures the highest peak level of noise reached at any moment and does not consider the duration of individual noise events.

While the City of Perris has adopted the noise level standard of 80 dBA L_{max}, this analysis relies on the FTA construction noise level of 80 dBA L_{eq} since L_{eq} considers the overall noise exposure and accounts for both high and low levels of noise during that period providing a more balanced representation of the construction noise exposure.

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 (9). To analyze vibration impacts originating from the operation and construction of the Stoneridge Commerce Center Specific Plan, vibration-generating activities are appropriately evaluated against standards established under the Municipal Code, if such standards exist. However, the County of Riverside does not identify specific construction vibration level limits. Therefore, for analysis purposes, the Caltrans *Transportation and Construction Vibration Guidance Manual*, (15 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).

3.6 BLASTING

The construction of the proposed Project will include blasting of hard rock areas, which is a major source of potential noise and vibration impacts to nearby residential receivers. Since the County of Riverside General Plan and County Code of Ordinances do not identify specific construction noise level limits for blasting activities, the Office of Surface Mining Reclamation and Enforcement (OSMRE) and the Code of Federal Regulations (CFR) Airblast Limits (30 CFR 816.67(b)) are used. Section 816.2 of Title 30 of the CFR indicates that the blasting regulations are intended to ensure that all surface mining activities are conducted in a manner which preserves and enhances environmental and other values in accordance with the Act. (2) While the OSMRE regulates mining activities, the blasting activities at the Project site represent surface mining activities which, to satisfy California Environmental Quality Act (CEQA) guidelines, must demonstrate that they do not adversely affect the existing environment. Therefore, the OSMRE blasting regulations are applied to the blasting activities anticipated at the Project site. For mining operations, which require larger blasts than that of the Project, the lowest noise level threshold identified in the CFR is a maximum noise level 129 dBA L_{max} for blasting activity measured at the location of any dwelling, public building, school, church, or community or institutional building outside the permit area. (2) The L_{max} threshold used in the noise analysis is suitable for single-event noise levels, such as blasting activities, since other noise regulations in L_{eq} (energy average), for example, average out a reference noise level over a given time period which reduces the single-event noise level over a longer period of time. The L_{max}, therefore, allows for the shorter-duration single-event noise levels to be evaluated against an appropriate threshold.

3.7 MARCH AIR RESERVE BASE/INLAND PORT AIRPORT LAND USE COMPATIBILITY

The March Air Reserve Base/Inland Port Airport (MARB/IPA) is located approximately five miles northwest of the Project site. The *Riverside County Airport Land Use Compatibility Plan Policy Document* (RC ALUCP) includes the policies for determining the land use compatibility of the Project. Policy 4.1.5 *Noise Exposure for Other Land Uses* of the RC ALUCP requires that land uses demonstrate compatibility with the acceptable noise levels on Table 2B. Table 2B *Supporting Compatibility Criteria: Noise* matrix is shown on Exhibit 3-C and indicates that the Project's industrial land uses experience *clearly acceptable* exterior noise levels below 60 dBA CNEL. *Normally acceptable* noise levels for industrial land use range from 60 to 65 dBA CNEL. *Marginally acceptable* noise levels at industrial land uses range from 65 to 70 dBA CNEL. (17) The 70, 65 and 60 dBA CNEL noise contour boundaries used to determine the potential aircraft-related noise impacts at the Project site are found on Figure 6-9 of the March Air Reserve Base 2018 Final Air Installations Compatible Uses Zones Study and are presented on Exhibit 3-D of this report. Based on the 2018 noise level contours for the MARB/IPA, the Project development area is located outside the 60 dBA CNEL noise level contour boundaries and the Project's industrial land use is considered *clearly acceptable.*

EXHIBIT 3-C: RC ALUCP SUPPORTING COMPATIBILITY CRITERIA: NOISE

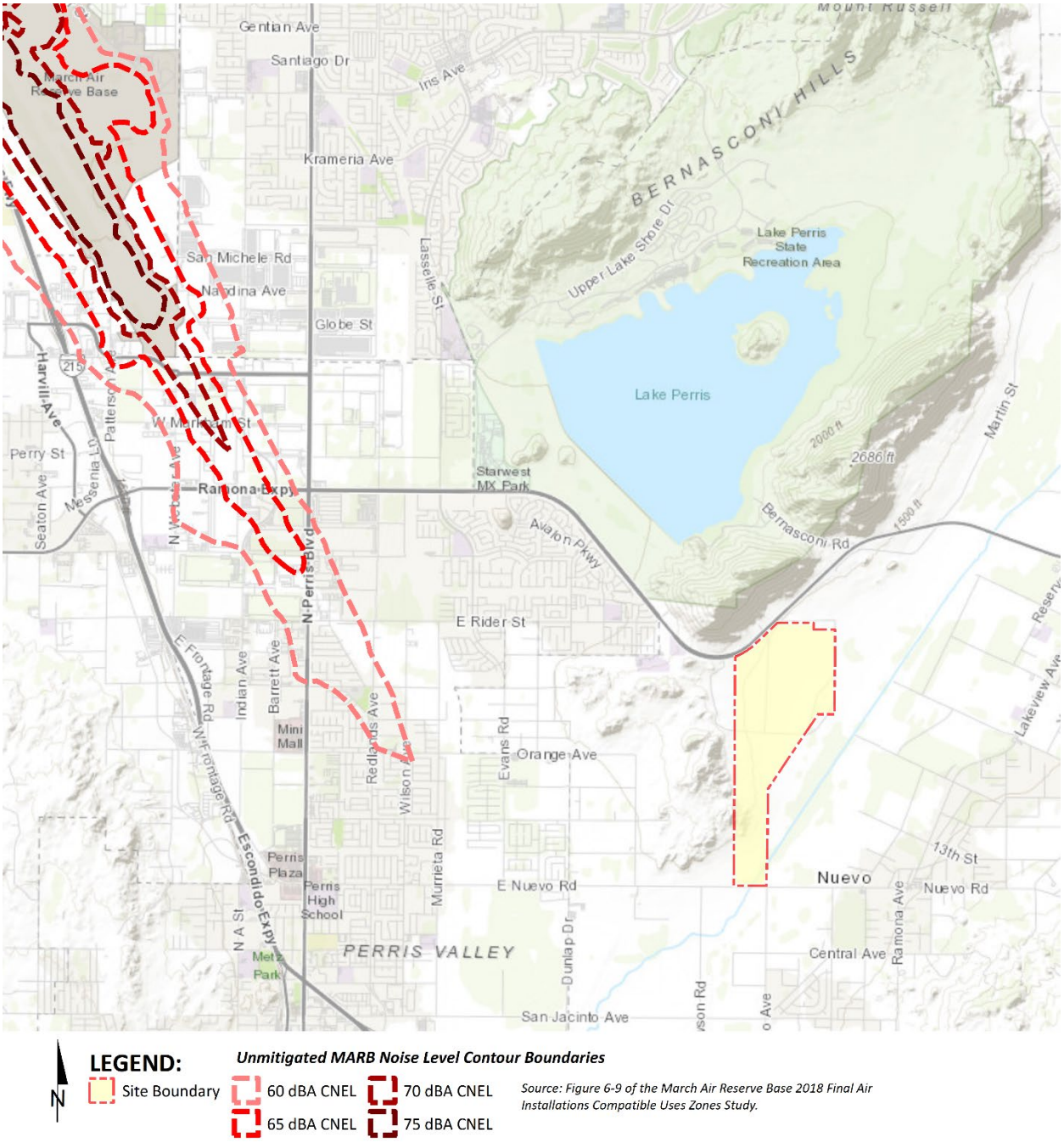
Land Use Category	CNEL (dB) 50–55	55–60	60–65	65–70	70–75
Residential *					
single-family, nursing homes, mobile homes	++	o	–	– –	– –
multi-family, apartments, condominiums	++	+	o	– –	– –
Public					
schools, libraries, hospitals	+	o	–	– –	– –
churches, auditoriums, concert halls	+	o	o	–	– –
transportation,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

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

* Subtract 5 dB for low-activity outlying airports (Chiriaco Summit and Desert Center)

Source: Riverside County Airport Land Use Compatibility Plan, Table 2B.

EXHIBIT 3-D: MARB/IPA FUTURE AIRPORT NOISE CONTOURS



LEGEND:

Unmitigated MARB Noise Level Contour Boundaries

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

Source: Figure 6-9 of the March Air Reserve Base 2018 Final Air Installations Compatible Uses Zones Study.

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 described above at the closest sensitive receiver locations. Under CEQA, consideration must be given to the magnitude of the increase, the existing baseline ambient noise levels, and the location of noise-sensitive receivers to determine if a noise increase represents a significant adverse environmental impact. This approach recognizes *that there is no single noise increase that renders a noise impact significant.* (18) This is primarily because of the wide variation in individual thresholds of annoyance and differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted—the so-called *ambient* environment. In general, the more a new noise level exceeds the previously existing ambient noise level, the less acceptable the new noise level will typically be judged.

Sensitive receivers are areas where humans are participating in activities that may be subject to the stress of significant interference from noise and often include residential dwellings, mobile homes, hotels, motels, hospitals, nursing homes, educational facilities, and libraries. Other receivers include office and industrial buildings, which are not considered as sensitive as single-family homes, but are still protected by the County of Riverside land use compatibility standards, as discussed below.

4.1.1 NOISE-SENSITIVE RECEIVERS

The Federal Interagency Committee on Noise (FICON) (19) developed guidance to be used for the assessment of project-generated increases in noise levels that consider the ambient noise level. The FICON recommendations are based on studies that relate aircraft noise levels to the percentage of persons highly annoyed by aircraft noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, these recommendations are often used in environmental noise impact assessments involving the use of cumulative noise exposure metrics, such as the average-daily noise level (CNEL) and equivalent continuous noise level (L_{eq}).

As previously stated, the approach used in this noise study recognizes *that there is no single noise increase that renders a noise impact significant*, based on a 2008 California Court of Appeal ruling on Gray v. County of Madera. (18) For example, if the ambient noise environment is quiet (<60 dBA) and the new noise source greatly increases the noise levels, an impact may occur if the noise criteria may be exceeded. Therefore, for this analysis, 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 (5 p. 9) and Caltrans (20 p. 2_48).

4.1.2 NON-NOISE-SENSITIVE RECEIVERS

The County of Riverside General Plan Noise Element, Table N-1, *Land Use Compatibility for Community Noise Exposure* was used to establish the satisfactory noise levels of significance for all the non-noise-sensitive land uses in the Project study area. This includes the non-noise sensitive land uses within the City of Perris even though the City of Perris does not consider noise increases to non-noise-sensitive uses to be significant. (21) As previously shown on Exhibit 3-A, the *normally acceptable* exterior noise level for non-noise-sensitive land use is 70 dBA CNEL. Noise levels greater than 70 dBA CNEL are considered *conditionally acceptable* per the *Land Use Compatibility for Community Noise Exposure*. (11)

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

4.2 VIBRATION (THRESHOLD B)

As described in Section 3.4, the vibration impacts originating from the construction of Stoneridge Commerce Center Specific Plan, 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)

The closest airport which would require additional noise analysis under CEQA Appendix G Guideline C is the MARB/IPA. As previously indicated in Section 3.5, the noise contour boundaries of MARB/IPA are presented on Exhibit 3-C of this report and shows that the Project's industrial land uses are considered *normally acceptable* since the development area is located outside the 60 dBA CNEL contour. Therefore, the Project impacts are considered *less than significant,* and no further noise analysis is provided under CEQA Significance Criteria C.

4.4 SIGNIFICANCE CRITERIA SUMMARY

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

TABLE 4-1: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Receiving Land Use	Condition(s)	Significance Criteria	
			Daytime	Nighttime
Off-Site Traffic	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	Exterior Noise Level Standards[3]	55 dBA L_{eq}	45 dBA L_{eq}
		If ambient is < 60 dBA Leq[1]	≥ 5 dBA L_{eq} Project increase	
		If ambient is 60 - 65 dBA Leq[1]	≥ 3 dBA L_{eq} Project increase	
		If ambient is > 65 dBA Leq[1]	≥ 1.5 dBA L_{eq} Project increase	
Construction	Noise-Sensitive	Noise Level Threshold[4]	80 dBA L_{eq}	70 dBA L_{eq}
		Vibration Level Threshold[5]	0.3 PPV (in/sec)	

[1] FICON, 1992.
[2] County of Riverside General Plan Noise Element, Table N-1.
[3] County of Riverside General Plan Municipal Code, Section 9.52.040.
[4] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual.
[5] Caltrans Transportation and Construction Vibration Manual, April 2020 Table 19
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, 24-hour noise level measurements were taken at eight locations in the Project study area. The receiver locations were selected to describe and document the existing noise environment within the Project study area. Exhibit 5-A provides the boundaries of the Project study area and the noise level measurement locations. To fully describe the existing noise conditions, noise level measurements were collected by Urban Crossroads, Inc. on Thursday, November 3rd, 2022. 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 and calculate the 24-hour CNEL. The long-term noise readings were recorded using Piccolo Type 2 integrating sound level meter and dataloggers. The Piccolo sound level meters were calibrated using a Larson-Davis calibrator, Model CAL 150. All noise meters were programmed in "slow" mode to record noise levels in "A" weighted form. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (22)

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*. (3) 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*. (9)

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. (9) 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 energy average hourly 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]		CNEL
		Daytime	Nighttime	
L1	Located west of the Project site near Lakeside Middle School located at 27720 Walnut St.	57.9	50.9	59.4
L2	Located near the northwest corner of the project site, south of Ramona Expressway.	64.5	62.7	69.6
L3	Located on northeast of the project site south of Ramona Expressway.	56.2	47.5	56.8
L4	Located northeast of the project site near the Nuview Bridge Early College High School.	55.4	44.9	56.4
L5	Located East of the project site near the residence located at 29520 11th Street.	48.9	43.7	51.5
L6	Located South of the project site near the residence at 29219 Alva Road.	67.2	64.7	71.8
L7	Located South of the project site and north of Nuevo Road.	68.7	65.6	72.9
L8	Located west of the project site north of Nuevo Road.	72.6	69.7	76.9

[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 hour as well as the minimum, maximum, L_2, L_5, L_8, L_{25}, L_{50}, L_{90}, L_{95}, and L_{99} percentile noise levels observed during the daytime and nighttime periods.

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 County of Riverside Noise 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

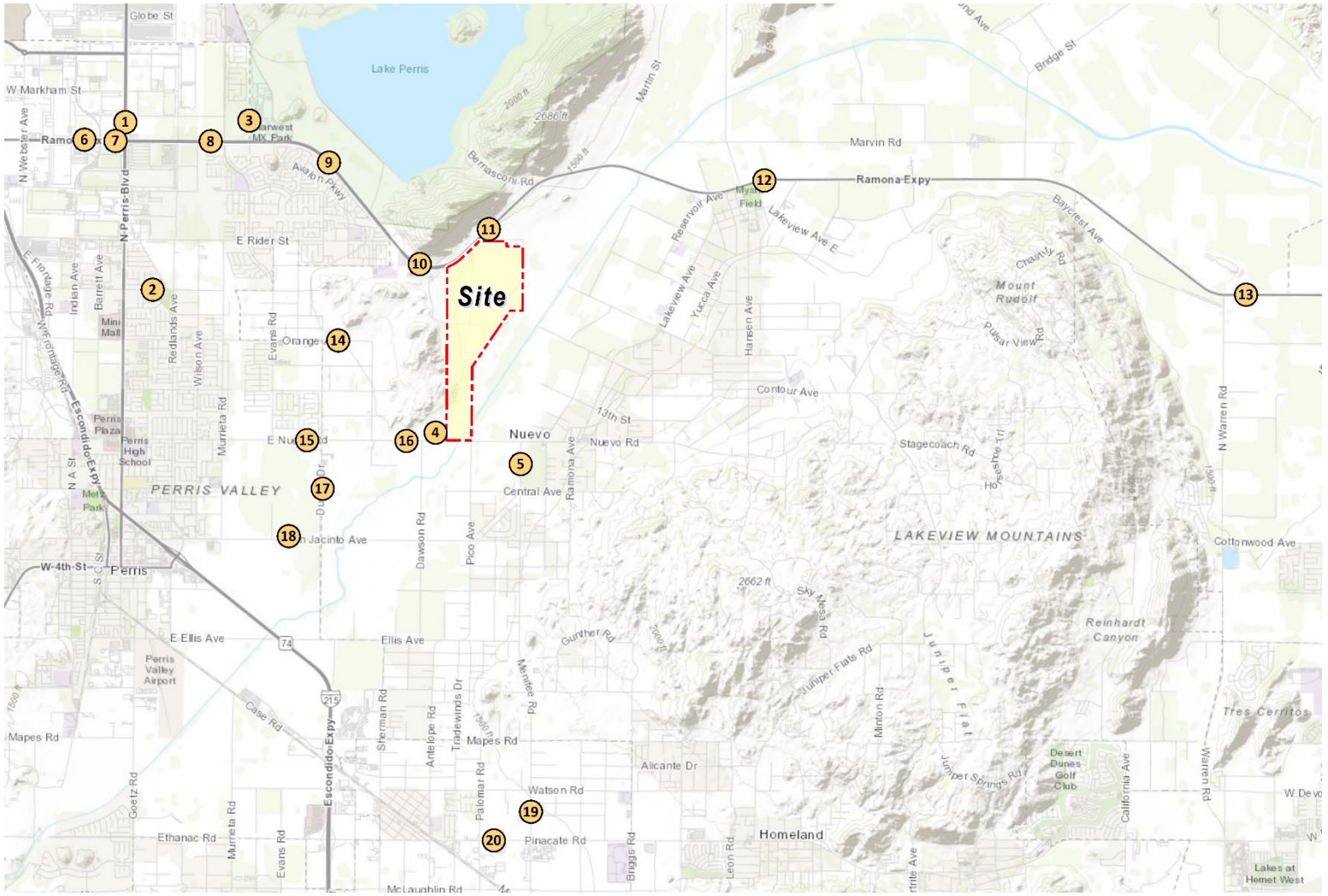
The expected roadway noise level increases from vehicular traffic were calculated by Urban Crossroads, Inc. using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108. (23) The FHWA Model arrives at a predicted noise level through 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. (24) 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. (25)

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 16 off-site study area roadway segments shown on Exhibit 6-A, the distance from the centerline to adjacent land use based on the functional roadway classifications per the County of Riverside General Plan Circulation Element, and the vehicle speeds. The ADT volumes used in this study are based on the *Stoneridge Commerce Center Specific Plan Traffic Impact Analysis*, prepared by Urban Crossroads, Inc. for the following traffic scenarios (2).

- Existing (E)
- Existing with Project (EP)
- Existing plus Ambient Growth plus Cumulative (EAC) without Project Conditions
- Existing plus Ambient Growth plus Cumulative (EAPC) with Project
- Horizon Year (2040) Without Project (Without MCP)
- Horizon Year (2040) With Project (Project Buildout Without MCP)
- Horizon Year (2040) Without Project (With MCP)
- Horizon Year (2040) With Project (Project Buildout With MCP)

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



6.1.2 OFF-SITE TRAFFIC TRUCK ROUTE ALTERNATIVES

In addition, the *Stoneridge Commerce Center Specific Plan* evaluated the following truck route alternatives which assume different truck routes for the proposed Project.

- Alternative 1 (Applicant Alternative): assumes all westbound trucks utilize Antelope Road south, then travel west on Nuevo Road, south on Dunlap Drive, west on San Jacinto Avenue, and south on Redlands Avenue to access the I-215 Freeway.
- Alternative 2 (Applicant Alternative): assumes all westbound trucks utilize Antelope Road south, then travel east on Nuevo Road, south on Menifee Road, west on San Jacinto Avenue, and south on Redlands Avenue to access the I-215 Freeway.
- Alternative 3 (City of Perris Alternative): assumes all westbound trucks utilize Antelope Road south, then travel east on Nuevo Road, south on Menifee Road, and west on SR-74 to access the I-215 Freeway.
- Alternative 4 (City of Perris Alternative): assumes all westbound trucks utilize Antelope Road south, then travel east on Nuevo Road, south on Menifee Road, northwest on Matthews Road, and west on Ethanac Road to access the I-215 Freeway.
- Alternative 5 (Attorney General Alternative): assumes all westbound trucks utilize Antelope Road south, then travel east on Nuevo Road, south on Menifee Road, west on San Jacinto Avenue, south on future Evans Avenue to access the I-215 Freeway. It should be noted, Evans Road, south of San Jacinto Avenue, and the I-215 Freeway/Evans Avenue interchange do not currently exist. As such, the noise study will assume these facilities are in place for trucks to access the I-215 Freeway.
- Alternative 6 (Applicant Alternative): assumes all westbound trucks utilize the future MCP to access the I-215 Freeway.

6.1.3 OFF-SITE TRAFFIC VOLUMES

The ADT volumes vary for each roadway segment based on the existing traffic volumes and the combination of project traffic distributions. Tables 6-2 to 6-7 present a summary of the study area roadway segment average daily traffic volumes. 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 analysis.

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 6-8 provides the time of day (daytime, evening, and nighttime) vehicle splits. The daily Project truck trip-ends were assigned to the individual off-site study area roadway segments based on the Project truck trip distribution percentages documented in the *Stoneridge Commerce Center Specific Plan Traffic Analysis*. Using the Project truck trips in combination with the Project trip distribution, Urban Crossroads, Inc. calculated the number of additional Project truck trips and vehicle mix percentages for each of the study area roadway segments. Table 6-9 shows the traffic flow by vehicle type (vehicle mix) used for all without Project traffic scenarios.

TABLE 6-1: OFF-SITE ROADWAY PARAMETERS

ID	Roadway	Segment	Receiving Land Use[1]	Classification[2]	Distance from Centerline to Receiving Land Use (Feet)[3]	Vehicle Speed (mph)
1	Perris Bl.	n/o Ramona Exwy.	Sensitive	Arterial	64'	50
2	Placentia Av.	e/o Perris Bl.	Non-Sensitive	Arterial	64'	50
3	Evans Rd.	n/o Ramona Exwy.	Sensitive	Arterial	64'	50
4	Antelope Rd.	n/o Nuevo Rd.	Non-Sensitive	Arterial	64'	50
5	Menifee Rd.	s/o Nuevo Rd.	Sensitive	Urban Arterial	76'	55
6	Ramona Exwy.	w/o Indian Av.	Non-Sensitive	Expressway	92'	55
7	Ramona Exwy.	w/o Perris Bl.	Sensitive	Expressway	92'	55
8	Ramona Exwy.	w/o Evans Rd.	Sensitive	Expressway	92'	55
9	Ramona Exwy.	w/o Bradley Rd.	Sensitive	Expressway	92'	55
10	Ramona Exwy.	s/o Rider St.	Sensitive	Expressway	92'	55
11	Ramona Exwy.	e/o Street A	Sensitive	Expressway	92'	55
12	Ramona Exwy.	e/o Davis Rd.	Non-Sensitive	Expressway	92'	55
13	Ramona Exwy.	e/o Warren Rd.	Non-Sensitive	Expressway	92'	55
14	Orange Av.	e/o Dunlap Dr.	Non-Sensitive	Arterial	64'	50
15	Nuevo Rd.	w/o Dunlap Dr.	Sensitive	Arterial	64'	50
16	Nuevo Rd.	w/o Antelope Rd.	Sensitive	Urban Arterial	76'	55
17	Dunlap Dr.	n/o San Jacinto Av.	Sensitive	Secondary	50'	45
18	San Jacinto Av.	w/o Dunlap Dr.	Sensitive	Secondary	50'	45
19	Menifee Rd.	n/o Ethanac Rd.	Sensitive	Urban Arterial	76'	55
20	Ethanac Rd.	w/o Menifee Rd.	Sensitive	Expressway	92'	55

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

TABLE 6-2: ALT 1 - AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic Volumes[1]							
			Existing		EAC (2030)		HY (2040) Without MCP		HY (2040) With MCP	
			Without Project	With Project	Without Project	With Project	Without Project	With Project	Without Project	With Project
1	Perris Bl.	n/o Ramona Exwy.	21,094	22,083	27,500	28,489	32,828	33,619	32,687	33,295
2	Placentia Av.	e/o Perris Bl.	2,793	2,793	5,975	5,975	6,893	9,662	14,354	14,354
3	Evans Rd.	n/o Ramona Exwy.	1,648	3,032	6,827	8,211	7,876	9,458	17,115	18,331
4	Antelope Rd.	n/o Nuevo Rd.	-	-	14,900	27,167	30,941	41,626	13,367	20,988
5	Menifee Rd.	s/o Nuevo Rd.	8,146	9,728	31,229	32,812	37,790	39,769	27,374	28,893
6	Ramona Exwy.	w/o Indian Av.	29,310	34,255	90,947	95,893	110,433	111,225	40,627	41,235
7	Ramona Exwy.	w/o Perris Bl.	28,761	34,101	88,149	93,491	107,646	108,834	75,600	76,512
8	Ramona Exwy.	w/o Evans Rd.	30,315	36,645	86,453	92,784	111,134	113,113	63,065	64,585
9	Ramona Exwy.	w/o Bradley Rd.	19,353	27,067	74,990	82,705	86,513	90,272	66,094	68,981
10	Ramona Exwy.	s/o Rider St.	23,001	32,891	89,538	99,429	114,317	118,670	70,343	73,686
11	Ramona Exwy.	e/o Street A	18,173	20,240	84,352	86,420	99,618	101,092	66,558	67,709
12	Ramona Exwy.	e/o Davis Rd.	20,709	22,380	88,243	89,916	103,666	105,141	44,450	45,449
13	Ramona Exwy.	e/o Warren Rd.	22,929	24,205	56,350	57,626	66,432	67,313	34,234	34,929
14	Orange Av.	e/o Dunlap Dr.	-	-	-	-	3,423	9,753	3,423	6,158
15	Nuevo Rd.	w/o Dunlap Dr.	8,718	13,861	44,027	49,171	56,523	60,084	27,754	28,969
16	Nuevo Rd.	w/o Antelope Rd.	9,688	19,582	61,710	71,604	82,299	90,413	37,244	42,891
17	Dunlap Dr.	n/o San Jacinto Av.	3,915	8,270	4,772	9,127	10,441	14,796	2,402	6,833
18	San Jacinto Av.	w/o Dunlap Dr.	9,151	13,506	12,022	16,378	18,805	23,160	20,029	24,307
19	Menifee Rd.	n/o Ethanac Rd.	6,872	7,465	35,677	36,271	41,823	42,813	37,984	38,745
20	Ethanac Rd.	w/o Menifee Rd.	19,774	19,971	24,104	24,302	28,029	28,227	50,962	51,114

[1] Stoneridge Commerce Center Specific Plan Traffic Analysis, Urban Crossroads, Inc.

TABLE 6-3: ALT 2 - AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic Volumes[1]							
			Existing		EAC (2030)		HY (2040) Without MCP		HY (2040) With MCP	
			Without Project	With Project	Without Project	With Project	Without Project	With Project	Without Project	With Project
1	Perris Bl.	n/o Ramona Exwy.	21,094	22,083	27,500	28,489	32,828	33,619	32,687	33,295
2	Placentia Av.	e/o Perris Bl.	2,793	2,793	5,975	5,975	6,893	9,662	14,354	14,354
3	Evans Rd.	n/o Ramona Exwy.	1,648	3,032	6,827	8,211	7,876	9,458	17,115	18,331
4	Antelope Rd.	n/o Nuevo Rd.	-	-	14,900	27,167	30,941	41,626	13,367	20,988
5	Menifee Rd.	s/o Nuevo Rd.	8,146	14,083	31,229	37,167	37,790	44,124	27,374	33,172
6	Ramona Exwy.	w/o Indian Av.	29,310	34,255	90,947	95,893	110,433	111,225	40,627	41,235
7	Ramona Exwy.	w/o Perris Bl.	28,761	34,101	88,149	93,491	107,646	108,834	75,600	76,512
8	Ramona Exwy.	w/o Evans Rd.	30,315	36,645	86,453	92,784	111,134	113,113	63,065	64,585
9	Ramona Exwy.	w/o Bradley Rd.	19,353	27,067	74,990	82,705	86,513	90,272	66,094	68,981
10	Ramona Exwy.	s/o Rider St.	23,001	32,891	89,538	99,429	114,317	118,670	70,343	73,686
11	Ramona Exwy.	e/o Street A	18,173	20,240	84,352	86,420	99,618	101,092	66,558	67,709
12	Ramona Exwy.	e/o Davis Rd.	20,709	22,380	88,243	89,916	103,666	105,141	44,450	45,449
13	Ramona Exwy.	e/o Warren Rd.	22,929	24,205	56,350	57,626	66,432	67,313	34,234	34,929
14	Orange Av.	e/o Dunlap Dr.	-	-	-	-	3,423	9,753	3,423	6,158
15	Nuevo Rd.	w/o Dunlap Dr.	8,718	13,861	44,027	49,171	56,523	60,084	27,754	28,969
16	Nuevo Rd.	w/o Antelope Rd.	9,688	15,227	61,710	67,249	82,299	86,058	37,244	38,612
17	Dunlap Dr.	n/o San Jacinto Av.	3,915	3,915	4,772	4,772	10,441	10,441	2,402	2,554
18	San Jacinto Av.	w/o Dunlap Dr.	9,151	13,506	12,022	16,378	18,805	23,160	20,029	24,307
19	Menifee Rd.	n/o Ethanac Rd.	6,872	7,465	35,677	36,271	41,823	42,813	37,984	38,745
20	Ethanac Rd.	w/o Menifee Rd.	19,774	19,971	24,104	24,302	28,029	28,227	50,962	51,114

[1] Stoneridge Commerce Center Specific Plan Traffic Analysis, Urban Crossroads, Inc.

TABLE 6-4: ALT 3 - AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic Volumes[1]							
			Existing		EAC (2030)		HY (2040) Without MCP		HY (2040) With MCP	
			Without Project	With Project	Without Project	With Project	Without Project	With Project	Without Project	With Project
1	Perris Bl.	n/o Ramona Exwy.	21,094	22,083	27,500	28,489	32,828	33,619	32,687	33,295
2	Placentia Av.	e/o Perris Bl.	2,793	2,793	5,975	5,975	6,893	9,662	14,354	14,354
3	Evans Rd.	n/o Ramona Exwy.	1,648	3,032	6,827	8,211	7,876	9,458	17,115	18,331
4	Antelope Rd.	n/o Nuevo Rd.	-	-	14,900	27,167	30,941	41,626	13,367	20,988
5	Menifee Rd.	s/o Nuevo Rd.	8,146	14,083	31,229	37,167	37,790	44,124	27,374	33,172
6	Ramona Exwy.	w/o Indian Av.	29,310	34,255	90,947	95,893	110,433	111,225	40,627	41,235
7	Ramona Exwy.	w/o Perris Bl.	28,761	34,101	88,149	93,491	107,646	108,834	75,600	76,512
8	Ramona Exwy.	w/o Evans Rd.	30,315	36,645	86,453	92,784	111,134	113,113	63,065	64,585
9	Ramona Exwy.	w/o Bradley Rd.	19,353	27,067	74,990	82,705	86,513	90,272	66,094	68,981
10	Ramona Exwy.	s/o Rider St.	23,001	32,891	89,538	99,429	114,317	118,670	70,343	73,686
11	Ramona Exwy.	e/o Street A	18,173	20,240	84,352	86,420	99,618	101,092	66,558	67,709
12	Ramona Exwy.	e/o Davis Rd.	20,709	22,380	88,243	89,916	103,666	105,141	44,450	45,449
13	Ramona Exwy.	e/o Warren Rd.	22,929	24,205	56,350	57,626	66,432	67,313	34,234	34,929
14	Orange Av.	e/o Dunlap Dr.	-	-	-	-	3,423	9,753	3,423	6,158
15	Nuevo Rd.	w/o Dunlap Dr.	8,718	13,861	44,027	49,171	56,523	60,084	27,754	28,969
16	Nuevo Rd.	w/o Antelope Rd.	9,688	15,227	61,710	67,249	82,299	86,058	37,244	38,612
17	Dunlap Dr.	n/o San Jacinto Av.	3,915	3,915	4,772	4,772	10,441	10,441	2,402	2,554
18	San Jacinto Av.	w/o Dunlap Dr.	9,151	9,151	12,022	12,023	18,805	18,805	20,029	20,029
19	Menifee Rd.	n/o Ethanac Rd.	6,872	11,821	35,677	40,626	41,823	47,168	37,984	43,023
20	Ethanac Rd.	w/o Menifee Rd.	19,774	24,327	24,104	28,657	28,029	32,582	50,962	55,393

[1] Stoneridge Commerce Center Specific Plan Traffic Analysis, Urban Crossroads, Inc.

TABLE 6-5: ALT 4 - AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic Volumes[1]							
			Existing		EAC (2030)		HY (2040) Without MCP		HY (2040) With MCP	
			Without Project	With Project	Without Project	With Project	Without Project	With Project	Without Project	With Project
1	Perris Bl.	n/o Ramona Exwy.	21,094	22,083	27,500	28,489	32,828	33,619	32,687	33,295
2	Placentia Av.	e/o Perris Bl.	2,793	2,793	5,975	5,975	6,893	9,662	14,354	14,354
3	Evans Rd.	n/o Ramona Exwy.	1,648	3,032	6,827	8,211	7,876	9,458	17,115	18,331
4	Antelope Rd.	n/o Nuevo Rd.	-	-	14,900	27,167	30,941	41,626	13,367	20,988
5	Menifee Rd.	s/o Nuevo Rd.	8,146	14,083	31,229	37,167	37,790	44,124	27,374	33,172
6	Ramona Exwy.	w/o Indian Av.	29,310	34,255	90,947	95,893	110,433	111,225	40,627	41,235
7	Ramona Exwy.	w/o Perris Bl.	28,761	34,101	88,149	93,491	107,646	108,834	75,600	76,512
8	Ramona Exwy.	w/o Evans Rd.	30,315	36,645	86,453	92,784	111,134	113,113	63,065	64,585
9	Ramona Exwy.	w/o Bradley Rd.	19,353	27,067	74,990	82,705	86,513	90,272	66,094	68,981
10	Ramona Exwy.	s/o Rider St.	23,001	32,891	89,538	99,429	114,317	118,670	70,343	73,686
11	Ramona Exwy.	e/o Street A	18,173	20,240	84,352	86,420	99,618	101,092	66,558	67,709
12	Ramona Exwy.	e/o Davis Rd.	20,709	22,380	88,243	89,916	103,666	105,141	44,450	45,449
13	Ramona Exwy.	e/o Warren Rd.	22,929	24,205	56,350	57,626	66,432	67,313	34,234	34,929
14	Orange Av.	e/o Dunlap Dr.	-	-	-	-	3,423	9,753	3,423	6,158
15	Nuevo Rd.	w/o Dunlap Dr.	8,718	13,861	44,027	49,171	56,523	60,084	27,754	28,969
16	Nuevo Rd.	w/o Antelope Rd.	9,688	15,227	61,710	67,249	82,299	86,058	37,244	38,612
17	Dunlap Dr.	n/o San Jacinto Av.	3,915	3,915	4,772	4,772	10,441	10,441	2,402	2,554
18	San Jacinto Av.	w/o Dunlap Dr.	9,151	9,151	12,022	12,023	18,805	18,805	20,029	20,029
19	Menifee Rd.	n/o Ethanac Rd.	6,872	11,821	35,677	40,626	41,823	47,168	37,984	43,023
20	Ethanac Rd.	w/o Menifee Rd.	19,774	19,971	24,104	24,302	28,029	28,227	50,962	51,114

[1] Stoneridge Commerce Center Specific Plan Traffic Analysis, Urban Crossroads, Inc.

TABLE 6-6: ALT 5 - AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic Volumes[1]							
			Existing		EAC (2030)		HY (2040) Without MCP		HY (2040) With MCP	
			Without Project	With Project	Without Project	With Project	Without Project	With Project	Without Project	With Project
1	Perris Bl.	n/o Ramona Exwy.	21,094	22,083	27,500	28,489	32,828	33,619	32,687	33,295
2	Placentia Av.	e/o Perris Bl.	2,793	2,793	5,975	5,975	6,893	9,662	14,354	14,354
3	Evans Rd.	n/o Ramona Exwy.	1,648	3,032	6,827	8,211	7,876	9,458	17,115	18,331
4	Antelope Rd.	n/o Nuevo Rd.	-	-	14,900	27,167	30,941	41,626	13,367	20,988
5	Menifee Rd.	s/o Nuevo Rd.	8,146	14,083	31,229	37,167	37,790	44,124	27,374	33,172
6	Ramona Exwy.	w/o Indian Av.	29,310	34,255	90,947	95,893	110,433	111,225	40,627	41,235
7	Ramona Exwy.	w/o Perris Bl.	28,761	34,101	88,149	93,491	107,646	108,834	75,600	76,512
8	Ramona Exwy.	w/o Evans Rd.	30,315	36,645	86,453	92,784	111,134	113,113	63,065	64,585
9	Ramona Exwy.	w/o Bradley Rd.	19,353	27,067	74,990	82,705	86,513	90,272	66,094	68,981
10	Ramona Exwy.	s/o Rider St.	23,001	32,891	89,538	99,429	114,317	118,670	70,343	73,686
11	Ramona Exwy.	e/o Street A	18,173	20,240	84,352	86,420	99,618	101,092	66,558	67,709
12	Ramona Exwy.	e/o Davis Rd.	20,709	22,380	88,243	89,916	103,666	105,141	44,450	45,449
13	Ramona Exwy.	e/o Warren Rd.	22,929	24,205	56,350	57,626	66,432	67,313	34,234	34,929
14	Orange Av.	e/o Dunlap Dr.	-	-	-	-	3,423	9,753	3,423	6,158
15	Nuevo Rd.	w/o Dunlap Dr.	8,718	13,861	44,027	49,171	56,523	60,084	27,754	28,969
16	Nuevo Rd.	w/o Antelope Rd.	9,688	15,227	61,710	67,249	82,299	86,058	37,244	38,612
17	Dunlap Dr.	n/o San Jacinto Av.	3,915	3,915	4,772	4,772	10,441	10,441	2,402	2,554
18	San Jacinto Av.	w/o Dunlap Dr.	9,151	13,506	12,022	16,378	18,805	23,160	20,029	24,307
19	Menifee Rd.	n/o Ethanac Rd.	6,872	7,465	35,677	36,271	41,823	42,813	37,984	38,745
20	Ethanac Rd.	w/o Menifee Rd.	19,774	19,971	24,104	24,302	28,029	28,227	50,962	51,114

[1] Stoneridge Commerce Center Specific Plan Traffic Analysis, Urban Crossroads, Inc.

TABLE 6-7: ALT 6 - AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic Volumes[1]							
			Existing		EAC (2030)		HY (2040) Without MCP		HY (2040) With MCP	
			Without Project	With Project	Without Project	With Project	Without Project	With Project	Without Project	With Project
1	Perris Bl.	n/o Ramona Exwy.	21,094	22,083	27,500	28,489	32,828	33,619	32,687	33,295
2	Placentia Av.	e/o Perris Bl.	2,793	2,793	5,975	5,975	6,893	9,662	14,354	14,354
3	Evans Rd.	n/o Ramona Exwy.	1,648	3,032	6,827	8,211	7,876	9,458	17,115	18,331
4	Antelope Rd.	n/o Nuevo Rd.	-	-	14,900	22,812	30,941	37,271	13,367	16,709
5	Menifee Rd.	s/o Nuevo Rd.	8,146	9,728	31,229	32,812	37,790	39,769	27,374	28,893
6	Ramona Exwy.	w/o Indian Av.	29,310	34,255	90,947	95,893	110,433	111,225	40,627	41,235
7	Ramona Exwy.	w/o Perris Bl.	28,761	34,101	88,149	93,491	107,646	108,834	75,600	76,512
8	Ramona Exwy.	w/o Evans Rd.	30,315	36,645	86,453	92,784	111,134	113,113	63,065	64,585
9	Ramona Exwy.	w/o Bradley Rd.	19,353	27,067	74,990	82,705	86,513	90,272	66,094	68,981
10	Ramona Exwy.	s/o Rider St.	23,001	32,891	89,538	99,429	114,317	118,670	70,343	73,686
11	Ramona Exwy.	e/o Street A	18,173	20,240	84,352	86,420	99,618	101,092	66,558	67,709
12	Ramona Exwy.	e/o Davis Rd.	20,709	22,380	88,243	89,916	103,666	105,141	44,450	45,449
13	Ramona Exwy.	e/o Warren Rd.	22,929	24,205	56,350	57,626	66,432	67,313	34,234	34,929
14	Orange Av.	e/o Dunlap Dr.	-	-	-	-	3,423	9,753	3,423	6,158
15	Nuevo Rd.	w/o Dunlap Dr.	8,718	13,861	44,027	49,171	56,523	60,084	27,754	28,969
16	Nuevo Rd.	w/o Antelope Rd.	9,688	15,227	61,710	67,249	82,299	86,058	37,244	38,612
17	Dunlap Dr.	n/o San Jacinto Av.	3,915	3,915	4,772	4,772	10,441	10,441	2,402	2,554
18	San Jacinto Av.	w/o Dunlap Dr.	9,151	9,151	12,022	12,023	18,805	18,805	20,029	20,029
19	Menifee Rd.	n/o Ethanac Rd.	6,872	7,465	35,677	36,271	41,823	42,813	37,984	38,745
20	Ethanac Rd.	w/o Menifee Rd.	19,774	19,971	24,104	24,302	28,029	28,227	50,962	51,114

[1] Stoneridge Commerce Center Specific Plan Traffic Analysis, Urban Crossroads, Inc.

TABLE 6-3: TIME OF DAY VEHICLE SPLITS

Vehicle Type	Time of Day Splits[1]			Total of Time of Day Splits
	Daytime	Evening	Nighttime	
Autos	72.41%	13.32%	14.28%	100.00%
Medium Trucks	69.55%	13.62%	16.83%	100.00%
Heavy Trucks	69.73%	21.47%	8.79%	100.00%

[1] Based on the March 11, 2020, 24-hour directional vehicle classification count collected on Nuevo Road east of Perris Boulevard (Stoneridge Commerce Center Specific Plan Traffic Analysis, Urban Crossroads, Inc.)
"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[1]			Total
	Autos	Medium Trucks	Heavy Trucks	
All Segments	89.71%	6.98%	3.32%	100.00%

[1] Based on the March 11, 2020, 24-hour directional vehicle classification count collected on Nuevo Road east of Perris Boulevard (Stoneridge Commerce Center Specific Plan Traffic Analysis, Urban Crossroads, Inc.)

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.

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7 OFF-SITE TRAFFIC NOISE ANALYSIS

As described in Section 4.1, the off-site traffic noise impacts are evaluated based on noise level increases resulting from the Project. Under CEQA, consideration must be given to the magnitude of the increase, the existing ambient noise levels, and the location of noise-sensitive receivers to determine if a noise increase represents a significant adverse environmental impact. To assess the off-site transportation CNEL noise level impacts associated with development of the proposed Project, noise contours were developed for each of the six different truck route alternatives outlined in *the Stoneridge Commerce Center Specific Plan Traffic Impact Analysis* prepared by Urban Crossroads, Inc. (2) Noise contour boundaries represent the equal levels of noise exposure and are measured in CNEL from the center of the roadway.

7.1 TRAFFIC NOISE CONTOURS

Noise contours were used to assess the Project's incremental 24-hour dBA CNEL traffic-related noise impacts at land uses adjacent to roadways conveying Project traffic. The noise contours shown on Tables 7-1 to 7-6 represent the distance to noise levels of a constant value and are measured from the center of the roadway for the 70, 65, and 60 dBA CNEL noise levels. The noise contours do not consider the effect of any existing noise barriers or topography that may attenuate ambient noise levels. In addition, because the noise contours reflect modeling of vehicular noise on area roadways, they appropriately do not reflect noise contributions from the surrounding stationary noise sources within the Project study area. Appendix 7.1 includes the traffic noise level contours worksheets for each traffic condition.

7.2 ALTERNATIVE 1 TRAFFIC NOISE LEVEL INCREASES

Table 7-1 presents a summary of the Alternative 1 off-site traffic CNEL noise level increases for each of the without and with Project conditions. For EP conditions, Table 7-1 shows that the Project off-site traffic noise level increases will range from 0.0 to 10.5 dBA CNEL, 0.0 to 9.7 dBA CNEL for EAC conditions, and 0.0 to 6.8 dBA CNEL for HY 2040 without MCP. This incremental noise level increase would exceed the applicable significance thresholds under the with Project scenario for the following four study area roadway segments:

- Antelope Road north of Nuevo Road (Segment #4) – Future roadway segment
- Nuevo Road west of Antelope Road (Segment #16)
- Dunlap Drive north of San Jacinto Avenue (Segment #17)
- San Jacinto Avenue west of Dunlap Drive (Segment #18)

Therefore, the Project's contribution to off-site traffic noise would result in a *potentially significant* off-site traffic noise impact.

TABLE 7-1: ALT 1 OFF-SITE TRAFFIC NOISE ANALYSIS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]									Incremental Noise Level Increase Threshold[3]	
				Existing			EAC (2030)			HY (2040) Without MCP				
				No Project	With Project	Project Increment	No Project	With Project	Project Increment	No Project	With Project	Project Increment	Limit	Exceeded?
1	Perris Bl.	n/o Ramona Exwy.	Sensitive	73.7	73.8	0.1	74.9	74.9	0.0	75.6	75.7	0.1	1.5	No
2	Placentia Av.	e/o Perris Bl.	Non-Sensitive	64.9	64.9	0.0	68.2	68.2	0.0	68.8	69.4	0.6	n/a	No
3	Evans Rd.	n/o Ramona Exwy.	Sensitive	62.6	63.8	1.2	68.8	69.1	0.3	69.4	69.7	0.3	3.0	No
4	Antelope Rd.	n/o Nuevo Rd.	Non-Sensitive	-	-	-	72.2	77.9	5.7	75.4	79.0	3.6	3.0	**Yes**
5	Menifee Rd.	s/o Nuevo Rd.	Sensitive	69.6	69.9	0.3	75.5	75.5	0.0	76.3	76.4	0.1	1.5	No
6	Ramona Exwy.	w/o Indian Av.	Non-Sensitive	74.1	74.4	0.3	79.1	79.1	0.0	79.9	79.9	0.0	3.0	No
7	Ramona Exwy.	w/o Perris Bl.	Sensitive	74.1	74.4	0.3	78.9	79.0	0.1	79.8	79.8	0.0	1.5	No
8	Ramona Exwy.	w/o Evans Rd.	Sensitive	74.3	74.6	0.3	78.8	79.0	0.2	79.9	80.0	0.1	1.5	No
9	Ramona Exwy.	w/o Bradley Rd.	Sensitive	72.3	72.9	0.6	78.2	78.4	0.2	78.8	78.9	0.1	1.5	No
10	Ramona Exwy.	s/o Rider St.	Sensitive	73.1	73.7	0.6	79.0	79.2	0.2	80.0	80.1	0.1	1.5	No
11	Ramona Exwy.	e/o Street A	Sensitive	72.1	72.4	0.3	78.7	78.8	0.1	79.5	79.5	0.0	1.5	No
12	Ramona Exwy.	e/o Davis Rd.	Non-Sensitive	72.6	72.9	0.3	78.9	79.0	0.1	79.6	79.7	0.1	3.0	No
13	Ramona Exwy.	e/o Warren Rd.	Non-Sensitive	73.1	73.3	0.2	77.0	77.1	0.1	77.7	77.8	0.1	3.0	No
14	Orange Av.	e/o Dunlap Dr.	Non-Sensitive	-	-	-	-	-	-	65.8	68.0	2.2	3.0	No
15	Nuevo Rd.	w/o Dunlap Dr.	Sensitive	69.9	70.7	0.8	76.9	77.1	0.2	78.0	78.1	0.1	1.5	No
16	Nuevo Rd.	w/o Antelope Rd.	Sensitive	70.4	77.3	6.9	78.4	80.5	2.1	79.7	81.3	1.6	1.5	**Yes**
17	Dunlap Dr.	n/o San Jacinto Av.	Sensitive	66.7	77.2	10.5	67.6	77.3	9.7	71.0	77.8	6.8	1.5	**Yes**
18	San Jacinto Av.	w/o Dunlap Dr.	Sensitive	70.4	77.7	7.3	71.6	77.9	6.3	73.5	78.4	4.9	1.5	**Yes**
19	Menifee Rd.	n/o Ethanac Rd.	Sensitive	68.9	69.0	0.1	76.0	76.1	0.1	76.7	76.8	0.1	1.5	No
20	Ethanac Rd.	w/o Menifee Rd.	Sensitive	72.4	72.4	0.0	73.3	73.3	0.0	73.9	74.0	0.1	1.5	No

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the receiving land use.
[3] Does the Project create an incremental noise level increase exceeding the significance criteria (Table 4-1)?
"n/a" Per the County of Riverside General Plan Noise Element Table N-1, a barely perceptible 3 dBA or greater noise level increase is considered a significant impact when the ambient non-noise sensitive noise level is greater than the normally acceptable 70 dBA CNEL land use compatibility criteria.

TABLE 7-2: ALT 2 OFF-SITE TRAFFIC NOISE ANALYSIS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]									Incremental Noise Level Increase Threshold[3]	
				Existing			EAC (2030)			HY (2040) Without MCP				
				No Project	With Project	Project Increment	No Project	With Project	Project Increment	No Project	With Project	Project Increment	Limit	Exceeded?
1	Perris Bl.	n/o Ramona Exwy.	Sensitive	73.7	73.8	0.1	74.9	74.9	0.0	75.6	75.7	0.1	1.5	No
2	Placentia Av.	e/o Perris Bl.	Non-Sensitive	64.9	64.9	0.0	68.2	68.2	0.0	68.8	69.4	0.6	n/a	No
3	Evans Rd.	n/o Ramona Exwy.	Sensitive	62.6	63.8	1.2	68.8	69.1	0.3	69.4	69.7	0.3	3.0	No
4	Antelope Rd.	n/o Nuevo Rd.	Non-Sensitive	-	-	-	72.2	77.9	5.7	75.4	79.0	3.6	3.0	**Yes**
5	Menifee Rd.	s/o Nuevo Rd.	Sensitive	69.6	77.0	7.4	75.5	78.8	3.3	76.3	79.2	2.9	1.5	**Yes**
6	Ramona Exwy.	w/o Indian Av.	Non-Sensitive	74.1	74.4	0.3	79.1	79.1	0.0	79.9	79.9	0.0	3.0	No
7	Ramona Exwy.	w/o Perris Bl.	Sensitive	74.1	74.4	0.3	78.9	79.0	0.1	79.8	79.8	0.0	1.5	No
8	Ramona Exwy.	w/o Evans Rd.	Sensitive	74.3	74.6	0.3	78.8	79.0	0.2	79.9	80.0	0.1	1.5	No
9	Ramona Exwy.	w/o Bradley Rd.	Sensitive	72.3	72.9	0.6	78.2	78.4	0.2	78.8	78.9	0.1	1.5	No
10	Ramona Exwy.	s/o Rider St.	Sensitive	73.1	73.7	0.6	79.0	79.2	0.2	80.0	80.1	0.1	1.5	No
11	Ramona Exwy.	e/o Street A	Sensitive	72.1	72.4	0.3	78.7	78.8	0.1	79.5	79.5	0.0	1.5	No
12	Ramona Exwy.	e/o Davis Rd.	Non-Sensitive	72.6	72.9	0.3	78.9	79.0	0.1	79.6	79.7	0.1	3.0	No
13	Ramona Exwy.	e/o Warren Rd.	Non-Sensitive	73.1	73.3	0.2	77.0	77.1	0.1	77.7	77.8	0.1	3.0	No
14	Orange Av.	e/o Dunlap Dr.	Non-Sensitive	-	-	-	-	-	-	65.8	68.0	2.2	3.0	No
15	Nuevo Rd.	w/o Dunlap Dr.	Sensitive	69.9	70.7	0.8	76.9	77.1	0.2	78.0	78.1	0.1	1.5	No
16	Nuevo Rd.	w/o Antelope Rd.	Sensitive	70.4	71.2	0.8	78.4	78.6	0.2	79.7	79.7	0.0	1.5	No
17	Dunlap Dr.	n/o San Jacinto Av.	Sensitive	66.7	66.7	0.0	67.6	67.6	0.0	71.0	71.0	0.0	1.5	No
18	San Jacinto Av.	w/o Dunlap Dr.	Sensitive	70.4	77.7	7.3	71.6	77.9	6.3	73.5	78.4	4.9	1.5	**Yes**
19	Menifee Rd.	n/o Ethanac Rd.	Sensitive	68.9	69.0	0.1	76.0	76.1	0.1	76.7	76.8	0.1	1.5	No
20	Ethanac Rd.	w/o Menifee Rd.	Sensitive	72.4	72.4	0.0	73.3	73.3	0.0	73.9	74.0	0.1	1.5	No

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

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

[3] Does the Project create an incremental noise level increase exceeding the significance criteria (Table 4-1)?

"n/a" Per the County of Riverside General Plan Noise Element Table N-1, a barely perceptible 3 dBA or greater noise level increase is considered a significant impact when the ambient non-noise sensitive noise level is greater than the normally acceptable 70 dBA CNEL land use compatibility criteria.

TABLE 7-3: ALT 3 OFF-SITE TRAFFIC NOISE ANALYSIS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]												Incremental Noise Level Increase Threshold[3]	
				Existing			EAC (2030)			HY (2040) Without MCP			HY (2040) With MCP				
				No Project	With Project	Project Increment	No Project	With Project	Project Increment	No Project	With Project	Project Increment	No Project	With Project	Project Increment	Limit	Exceeded?
1	Perris Bl.	n/o Ramona Exwy.	Sensitive	73.7	73.8	0.1	74.9	74.9	0.0	75.6	75.7	0.1	75.6	75.6	0.0	1.5	No
2	Placentia Av.	e/o Perris Bl.	Non-Sensitive	64.9	64.9	0.0	68.2	68.2	0.0	68.8	69.4	0.6	72.0	72.0	0.0	n/a	No
3	Evans Rd.	n/o Ramona Exwy.	Sensitive	62.6	63.8	1.2	68.8	69.1	0.3	69.4	69.7	0.3	72.8	72.9	0.1	3.0	No
4	Antelope Rd.	n/o Nuevo Rd.	Non-Sensitive	-	-	-	72.2	77.9	5.7	75.4	79.0	3.6	71.7	77.6	5.9	3.0	**Yes**
5	Menifee Rd.	s/o Nuevo Rd.	Sensitive	69.6	77.0	7.4	75.5	78.8	3.3	76.3	79.2	2.9	74.9	78.5	3.6	1.5	**Yes**
6	Ramona Exwy.	w/o Indian Av.	Non-Sensitive	74.1	74.4	0.3	79.1	79.1	0.0	79.9	79.9	0.0	75.6	75.6	0.0	3.0	No
7	Ramona Exwy.	w/o Perris Bl.	Sensitive	74.1	74.4	0.3	78.9	79.0	0.1	79.8	79.8	0.0	78.3	78.3	0.0	1.5	No
8	Ramona Exwy.	w/o Evans Rd.	Sensitive	74.3	74.6	0.3	78.8	79.0	0.2	79.9	80.0	0.1	77.5	77.5	0.0	1.5	No
9	Ramona Exwy.	w/o Bradley Rd.	Sensitive	72.3	72.9	0.6	78.2	78.4	0.2	78.8	78.9	0.1	77.7	77.7	0.0	1.5	No
10	Ramona Exwy.	s/o Rider St.	Sensitive	73.1	73.7	0.6	79.0	79.2	0.2	80.0	80.1	0.1	77.9	78.0	0.1	1.5	No
11	Ramona Exwy.	e/o Street A	Sensitive	72.1	72.4	0.3	78.7	78.8	0.1	79.5	79.5	0.0	77.7	77.8	0.1	1.5	No
12	Ramona Exwy.	e/o Davis Rd.	Non-Sensitive	72.6	72.9	0.3	78.9	79.0	0.1	79.6	79.7	0.1	75.9	76.0	0.1	3.0	No
13	Ramona Exwy.	e/o Warren Rd.	Non-Sensitive	73.1	73.3	0.2	77.0	77.1	0.1	77.7	77.8	0.1	74.8	74.9	0.1	3.0	No
14	Orange Av.	e/o Dunlap Dr.	Non-Sensitive	-	-	-	-	-	-	65.8	68.0	2.2	65.8	66.9	1.1	3.0	No
15	Nuevo Rd.	w/o Dunlap Dr.	Sensitive	69.9	70.7	0.8	76.9	77.1	0.2	78.0	78.1	0.1	74.9	75.0	0.1	1.5	No
16	Nuevo Rd.	w/o Antelope Rd.	Sensitive	70.4	71.2	0.8	78.4	78.6	0.2	79.7	79.7	0.0	76.2	76.3	0.1	1.5	No
17	Dunlap Dr.	n/o San Jacinto Av.	Sensitive	66.7	66.7	0.0	67.6	67.6	0.0	71.0	71.0	0.0	64.6	64.7	0.1	1.5	No
18	San Jacinto Av.	w/o Dunlap Dr.	Sensitive	70.4	70.4	0.0	71.6	71.6	0.0	73.5	73.5	0.0	73.8	73.8	0.0	1.5	No
19	Menifee Rd.	n/o Ethanac Rd.	Sensitive	68.9	76.8	7.9	76.0	79.0	3.0	76.7	79.4	2.7	76.3	79.1	2.8	1.5	**Yes**
20	Ethanac Rd.	w/o Menifee Rd.	Sensitive	72.4	76.9	4.5	73.3	77.2	3.9	73.9	77.5	3.6	76.5	78.8	2.3	1.5	**Yes**

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

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

[3] Does the Project create an incremental noise level increase exceeding the significance criteria (Table 4-1)?

"n/a" Per the County of Riverside General Plan Noise Element Table N-1, a barely perceptible 3 dBA or greater noise level increase is considered a significant impact when the ambient non-noise sensitive noise level is greater than the normally acceptable 70 dBA CNEL land use compatibility criteria.

TABLE 7-4: ALT 4 OFF-SITE TRAFFIC NOISE ANALYSIS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]												Incremental Noise Level Increase Threshold[3]	
				Existing			EAC (2030)			HY (2040) Without MCP			HY (2040) With MCP				
				No Project	With Project	Project Increment	No Project	With Project	Project Increment	No Project	With Project	Project Increment	No Project	With Project	Project Increment	Limit	Exceeded?
1	Perris Bl.	n/o Ramona Exwy.	Sensitive	73.7	73.8	0.1	74.9	74.9	0.0	75.6	75.7	0.1	75.6	75.6	0.0	1.5	No
2	Placentia Av.	e/o Perris Bl.	Non-Sensitive	64.9	64.9	0.0	68.2	68.2	0.0	68.8	69.4	0.6	72.0	72.0	0.0	n/a	No
3	Evans Rd.	n/o Ramona Exwy.	Sensitive	62.6	63.8	1.2	68.8	69.1	0.3	69.4	69.7	0.3	72.8	72.9	0.1	3.0	No
4	Antelope Rd.	n/o Nuevo Rd.	Non-Sensitive	-	-	-	72.2	77.9	5.7	75.4	79.0	3.6	71.7	77.6	5.9	3.0	**Yes**
5	Menifee Rd.	s/o Nuevo Rd.	Sensitive	69.6	77.0	7.4	75.5	78.8	3.3	76.3	79.2	2.9	74.9	78.5	3.6	1.5	**Yes**
6	Ramona Exwy.	w/o Indian Av.	Non-Sensitive	74.1	74.4	0.3	79.1	79.1	0.0	79.9	79.9	0.0	75.6	75.6	0.0	3.0	No
7	Ramona Exwy.	w/o Perris Bl.	Sensitive	74.1	74.4	0.3	78.9	79.0	0.1	79.8	79.8	0.0	78.3	78.3	0.0	1.5	No
8	Ramona Exwy.	w/o Evans Rd.	Sensitive	74.3	74.6	0.3	78.8	79.0	0.2	79.9	80.0	0.1	77.5	77.5	0.0	1.5	No
9	Ramona Exwy.	w/o Bradley Rd.	Sensitive	72.3	72.9	0.6	78.2	78.4	0.2	78.8	78.9	0.1	77.7	77.7	0.0	1.5	No
10	Ramona Exwy.	s/o Rider St.	Sensitive	73.1	73.7	0.6	79.0	79.2	0.2	80.0	80.1	0.1	77.9	78.0	0.1	1.5	No
11	Ramona Exwy.	e/o Street A	Sensitive	72.1	72.4	0.3	78.7	78.8	0.1	79.5	79.5	0.0	77.7	77.8	0.1	1.5	No
12	Ramona Exwy.	e/o Davis Rd.	Non-Sensitive	72.6	72.9	0.3	78.9	79.0	0.1	79.6	79.7	0.1	75.9	76.0	0.1	3.0	No
13	Ramona Exwy.	e/o Warren Rd.	Non-Sensitive	73.1	73.3	0.2	77.0	77.1	0.1	77.7	77.8	0.1	74.8	74.9	0.1	3.0	No
14	Orange Av.	e/o Dunlap Dr.	Non-Sensitive	-	-	-	-	-	-	65.8	68.0	2.2	65.8	66.9	1.1	3.0	No
15	Nuevo Rd.	w/o Dunlap Dr.	Sensitive	69.9	70.7	0.8	76.9	77.1	0.2	78.0	78.1	0.1	74.9	75.0	0.1	1.5	No
16	Nuevo Rd.	w/o Antelope Rd.	Sensitive	70.4	71.2	0.8	78.4	78.6	0.2	79.7	79.7	0.0	76.2	76.3	0.1	1.5	No
17	Dunlap Dr.	n/o San Jacinto Av.	Sensitive	66.7	66.7	0.0	67.6	67.6	0.0	71.0	71.0	0.0	64.6	64.7	0.1	1.5	No
18	San Jacinto Av.	w/o Dunlap Dr.	Sensitive	70.4	70.4	0.0	71.6	71.6	0.0	73.5	73.5	0.0	73.8	73.8	0.0	1.5	No
19	Menifee Rd.	n/o Ethanac Rd.	Sensitive	68.9	76.8	7.9	76.0	79.0	3.0	76.7	79.4	2.7	76.3	79.1	2.8	1.5	**Yes**
20	Ethanac Rd.	w/o Menifee Rd.	Sensitive	72.4	72.4	0.0	73.3	73.3	0.0	73.9	74.0	0.1	76.5	76.5	0.0	1.5	No

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

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

[3] Does the Project create an incremental noise level increase exceeding the significance criteria (Table 4-1)?

"n/a" Per the County of Riverside General Plan Noise Element Table N-1, a barely perceptible 3 dBA or greater noise level increase is considered a significant impact when the ambient non-noise sensitive noise level is greater than the normally acceptable 70 dBA CNEL land use compatibility criteria.

TABLE 7-5: ALT 5 OFF-SITE TRAFFIC NOISE ANALYSIS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]												Incremental Noise Level Increase Threshold[3]	
				Existing			EAC (2030)			HY (2040) Without MCP			HY (2040) With MCP				
				No Project	With Project	Project Increment	No Project	With Project	Project Increment	No Project	With Project	Project Increment	No Project	With Project	Project Increment	Limit	Exceeded?
1	Perris Bl.	n/o Ramona Exwy.	Sensitive	73.7	73.8	0.1	74.9	74.9	0.0	75.6	75.7	0.1	75.6	75.6	0.0	1.5	No
2	Placentia Av.	e/o Perris Bl.	Non-Sensitive	64.9	64.9	0.0	68.2	68.2	0.0	68.8	69.4	0.6	72.0	72.0	0.0	n/a	No
3	Evans Rd.	n/o Ramona Exwy.	Sensitive	62.6	63.8	1.2	68.8	69.1	0.3	69.4	69.7	0.3	72.8	72.9	0.1	3.0	No
4	Antelope Rd.	n/o Nuevo Rd.	Non-Sensitive	-	-	-	72.2	77.9	5.7	75.4	79.0	3.6	71.7	77.6	5.9	3.0	**Yes**
5	Menifee Rd.	s/o Nuevo Rd.	Sensitive	69.6	77.0	7.4	75.5	78.8	3.3	76.3	79.2	2.9	74.9	78.5	3.6	1.5	**Yes**
6	Ramona Exwy.	w/o Indian Av.	Non-Sensitive	74.1	74.4	0.3	79.1	79.1	0.0	79.9	79.9	0.0	75.6	75.6	0.0	3.0	No
7	Ramona Exwy.	w/o Perris Bl.	Sensitive	74.1	74.4	0.3	78.9	79.0	0.1	79.8	79.8	0.0	78.3	78.3	0.0	1.5	No
8	Ramona Exwy.	w/o Evans Rd.	Sensitive	74.3	74.6	0.3	78.8	79.0	0.2	79.9	80.0	0.1	77.5	77.5	0.0	1.5	No
9	Ramona Exwy.	w/o Bradley Rd.	Sensitive	72.3	72.9	0.6	78.2	78.4	0.2	78.8	78.9	0.1	77.7	77.7	0.0	1.5	No
10	Ramona Exwy.	s/o Rider St.	Sensitive	73.1	73.7	0.6	79.0	79.2	0.2	80.0	80.1	0.1	77.9	78.0	0.1	1.5	No
11	Ramona Exwy.	e/o Street A	Sensitive	72.1	72.4	0.3	78.7	78.8	0.1	79.5	79.5	0.0	77.7	77.8	0.1	1.5	No
12	Ramona Exwy.	e/o Davis Rd.	Non-Sensitive	72.6	72.9	0.3	78.9	79.0	0.1	79.6	79.7	0.1	75.9	76.0	0.1	3.0	No
13	Ramona Exwy.	e/o Warren Rd.	Non-Sensitive	73.1	73.3	0.2	77.0	77.1	0.1	77.7	77.8	0.1	74.8	74.9	0.1	3.0	No
14	Orange Av.	e/o Dunlap Dr.	Non-Sensitive	-	-	-	-	-	-	65.8	68.0	2.2	65.8	66.9	1.1	3.0	No
15	Nuevo Rd.	w/o Dunlap Dr.	Sensitive	69.9	70.7	0.8	76.9	77.1	0.2	78.0	78.1	0.1	74.9	75.0	0.1	1.5	No
16	Nuevo Rd.	w/o Antelope Rd.	Sensitive	70.4	71.2	0.8	78.4	78.6	0.2	79.7	79.7	0.0	76.2	76.3	0.1	1.5	No
17	Dunlap Dr.	n/o San Jacinto Av.	Sensitive	66.7	66.7	0.0	67.6	67.6	0.0	71.0	71.0	0.0	64.6	64.7	0.1	1.5	No
18	San Jacinto Av.	w/o Dunlap Dr.	Sensitive	70.4	77.7	7.3	71.6	77.9	6.3	73.5	78.4	4.9	73.8	78.5	4.7	1.5	**Yes**
19	Menifee Rd.	n/o Ethanac Rd.	Sensitive	68.9	69.0	0.1	76.0	76.1	0.1	76.7	76.8	0.1	76.3	76.3	0.0	1.5	No
20	Ethanac Rd.	w/o Menifee Rd.	Sensitive	72.4	72.4	0.0	73.3	73.3	0.0	73.9	74.0	0.1	76.5	76.5	0.0	1.5	No

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

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

[3] Does the Project create an incremental noise level increase exceeding the significance criteria (Table 4-1)?

"n/a" Per the County of Riverside General Plan Noise Element Table N-1, a barely perceptible 3 dBA or greater noise level increase is considered a significant impact when the ambient non-noise sensitive noise level is greater than the normally acceptable 70 dBA CNEL land use compatibility criteria.

TABLE 7-6: ALT 6 OFF-SITE TRAFFIC NOISE ANALYSIS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]												Incremental Noise Level Increase Threshold[3]	
				Existing			EAC (2030)			HY (2040) Without MCP			HY (2040) With MCP				
				No Project	With Project	Project Increment	No Project	With Project	Project Increment	No Project	With Project	Project Increment	No Project	With Project	Project Increment	Limit	Exceeded?
1	Perris Bl.	n/o Ramona Exwy.	Sensitive	73.7	73.8	0.1	74.9	74.9	0.0	75.6	75.7	0.1	75.6	75.6	0.0	1.5	No
2	Placentia Av.	e/o Perris Bl.	Non-Sensitive	64.9	64.9	0.0	68.2	68.2	0.0	68.8	69.4	0.6	72.0	72.0	0.0	n/a	No
3	Evans Rd.	n/o Ramona Exwy.	Sensitive	62.6	63.8	1.2	68.8	69.1	0.3	69.4	69.7	0.3	72.8	72.9	0.1	3.0	No
4	Antelope Rd.	n/o Nuevo Rd.	Non-Sensitive	-	-	-	72.2	73.0	0.8	75.4	75.7	0.3	71.7	72.1	0.4	3.0	No
5	Menifee Rd.	s/o Nuevo Rd.	Sensitive	69.6	69.9	0.3	75.5	75.5	0.0	76.3	76.4	0.1	74.9	75.0	0.1	1.5	No
6	Ramona Exwy.	w/o Indian Av.	Non-Sensitive	74.1	74.4	0.3	79.1	79.1	0.0	79.9	79.9	0.0	75.6	75.6	0.0	3.0	No
7	Ramona Exwy.	w/o Perris Bl.	Sensitive	74.1	74.4	0.3	78.9	79.0	0.1	79.8	79.8	0.0	78.3	78.3	0.0	1.5	No
8	Ramona Exwy.	w/o Evans Rd.	Sensitive	74.3	74.6	0.3	78.8	79.0	0.2	79.9	80.0	0.1	77.5	77.5	0.0	1.5	No
9	Ramona Exwy.	w/o Bradley Rd.	Sensitive	72.3	72.9	0.6	78.2	78.4	0.2	78.8	78.9	0.1	77.7	77.7	0.0	1.5	No
10	Ramona Exwy.	s/o Rider St.	Sensitive	73.1	73.7	0.6	79.0	79.2	0.2	80.0	80.1	0.1	77.9	78.0	0.1	1.5	No
11	Ramona Exwy.	e/o Street A	Sensitive	72.1	72.4	0.3	78.7	78.8	0.1	79.5	79.5	0.0	77.7	77.8	0.1	1.5	No
12	Ramona Exwy.	e/o Davis Rd.	Non-Sensitive	72.6	72.9	0.3	78.9	79.0	0.1	79.6	79.7	0.1	75.9	76.0	0.1	3.0	No
13	Ramona Exwy.	e/o Warren Rd.	Non-Sensitive	73.1	73.3	0.2	77.0	77.1	0.1	77.7	77.8	0.1	74.8	74.9	0.1	3.0	No
14	Orange Av.	e/o Dunlap Dr.	Non-Sensitive	-	-	-	-	-	-	65.8	68.0	2.2	65.8	66.9	1.1	3.0	No
15	Nuevo Rd.	w/o Dunlap Dr.	Sensitive	69.9	70.7	0.8	76.9	77.1	0.2	78.0	78.1	0.1	74.9	75.0	0.1	1.5	No
16	Nuevo Rd.	w/o Antelope Rd.	Sensitive	70.4	71.2	0.8	78.4	78.6	0.2	79.7	79.7	0.0	76.2	76.3	0.1	1.5	No
17	Dunlap Dr.	n/o San Jacinto Av.	Sensitive	66.7	66.7	0.0	67.6	67.6	0.0	71.0	71.0	0.0	64.6	64.7	0.1	1.5	No
18	San Jacinto Av.	w/o Dunlap Dr.	Sensitive	70.4	70.4	0.0	71.6	71.6	0.0	73.5	73.5	0.0	73.8	73.8	0.0	1.5	No
19	Menifee Rd.	n/o Ethanac Rd.	Sensitive	68.9	69.0	0.1	76.0	76.1	0.1	76.7	76.8	0.1	76.3	76.3	0.0	1.5	No
20	Ethanac Rd.	w/o Menifee Rd.	Sensitive	72.4	72.4	0.0	73.3	73.3	0.0	73.9	74.0	0.1	76.5	76.5	0.0	1.5	No

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

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

[3] Does the Project create an incremental noise level increase exceeding the significance criteria (Table 4-1)?

"n/a" Per the County of Riverside General Plan Noise Element Table N-1, a barely perceptible 3 dBA or greater noise level increase is considered a significant impact when the ambient non-noise sensitive noise level is greater than the normally acceptable 70 dBA CNEL land use compatibility criteria.

7.3 ALTERNATIVE 2 TRAFFIC NOISE LEVEL INCREASES

Table 7-2 presents a summary of the Alternative 2 off-site traffic CNEL noise level increases for each of the without and with Project conditions. For EP conditions, Table 7-2 shows that the Project off-site traffic noise level increases will range from 0.0 to 7.4 dBA CNEL, 0.0 to 6.3 dBA CNEL for EAC conditions and 0.0 to 4.9 dBA CNEL for the HY without MCP conditions. This incremental noise level increase would exceed the applicable significance thresholds under the with Project scenario for the following three study area roadway segments:

- Antelope Road north of Nuevo Road (Segment #4) – Future roadway segment
- Menifee Road south of Nuevo Road (Segment #5)
- San Jacinto Avenue west of Dunlap Drive (Segment #18)

Therefore, the Project's contribution to off-site traffic noise would result in a *potentially significant* off-site traffic noise impact.

7.4 ALTERNATIVE 3 TRAFFIC NOISE LEVEL INCREASES

Table 7-3 presents a summary of the Alternative 3 off-site traffic CNEL noise level increases for each of the without and with Project conditions. For EP conditions, Table 7-3 shows that the Project off-site traffic noise level increases will range from 0.0 to 7.9 dBA CNEL, 0.0 to 5.7 dBA CNEL for EAC, 0.0 to 3.6 dBA CNEL for HY 2040 without MCP and 0.0 to 5.9 dBA CNEL for the HY with MCP conditions. This incremental noise level increase would exceed the applicable significance thresholds under the with Project scenario for the following four study area roadway segments:

- Antelope Road north of Nuevo Road (Segment #4) – Future roadway segment
- Menifee Road south of Nuevo Road (Segment #5)
- Menifee Road north of Ethanac Road (Segment #19)
- Ethanac Road west of Menifee Road (Segment #20)

Therefore, the Project's contribution to off-site traffic noise would result in a *potentially significant* off-site traffic noise impact.

7.5 ALTERNATIVE 4 TRAFFIC NOISE LEVEL INCREASES

Table 7-4 presents a summary of the Alternative 4 off-site traffic CNEL noise level increases for each of the without and with Project conditions. For EP conditions, Table 7-4 shows that the Project off-site traffic noise level increases will range from 0.0 to 7.9 dBA CNEL, 0.0 to 5.7 dBA CNEL for EAC, 0.0 to 3.6 dBA CNEL for HY 2040 without MCP and 0.0 to 5.9 dBA CNEL for the HY with MCP conditions. This incremental noise level increase would exceed the applicable significance thresholds under the with Project scenario for the following three study area roadway segments:

- Antelope Road north of Nuevo Road (Segment #4) – Future roadway segment
- Menifee Road south of Nuevo Road (Segment #5)
- Menifee Road north of Ethanac Road (Segment #19)

Therefore, the Project's contribution to off-site traffic noise would result in a *potentially significant* off-site traffic noise impact.

7.6 ALTERNATIVE 5 TRAFFIC NOISE LEVEL INCREASES

Table 7-5 presents a summary of the Alternative 5 off-site traffic CNEL noise level increases for each of the without and with Project conditions. For EP conditions, Table 7-5 shows that the Project off-site traffic noise level increases will range from 0.0 to 7.4 dBA CNEL, 0.0 to 6.3 dBA CNEL for EAC, 0.0 to 4.9 dBA CNEL for HY 2040 without MCP and 0.0 to 5.9 dBA CNEL for the HY with MCP conditions. This incremental noise level increase would exceed the applicable significance thresholds under the with Project scenario for the following three study area roadway segments:

- Antelope Road north of Nuevo Road (Segment #4) – Future roadway segment
- Menifee Road south of Nuevo Road (Segment #5)
- San Jacinto Avenue west of Dunlap Drive (Segment #18)

Therefore, the Project's contribution to off-site traffic noise would result in a *potentially significant* off-site traffic noise impact.

7.7 ALTERNATIVE 6 TRAFFIC NOISE LEVEL INCREASES

Table 7-6 presents a summary of the Alternative 6 off-site traffic CNEL noise level increases for each of the without and with Project conditions. For EP conditions, Table 7-6 shows that the Project off-site traffic noise level increases will range from 0.0 to 1.2 dBA CNEL, 0.0 to 0.8 dBA CNEL for EAC, 0.0 to 2.2 dBA CNEL for HY 2040 without MCP and 0.0 to 1.1 dBA CNEL for the HY with MCP conditions. 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 the Alternative 6 unmitigated Project-related traffic noise levels.

7.8 OFF-SITE TRAFFIC NOISE MITIGATION

The off-site Traffic Noise Analysis shows that Project traffic noise level increases on study area roadway segments will exceed the incremental noise level increase thresholds shown on Table 4-1. To reduce the *potentially significant* Project traffic noise level increases on the study area roadway segments, several potential noise mitigation measures were considered in this analysis. Potential mitigation measures discussed below include rubberized asphalt hot mix pavement and off-site noise barriers for the existing noise sensitive residential land uses adjacent to impacted roadway segments.

7.8.1 RUBBERIZED ASPHALT

Due to the potential noise attenuation benefits, rubberized asphalt is considered as a mitigation measure for the off-site Project-related traffic noise level increases. To reduce traffic noise levels at the noise source, Caltrans research has shown that rubberized asphalt can provide noise attenuation of approximately 4 dBA for automobile traffic noise levels. (26) Changing the

pavement type of a roadway has been shown to reduce the amount of tire/pavement noise produced at the source under both near-term and long-term conditions. Traffic noise is generated primarily by the interaction of the tires and pavement, the engine, and exhaust systems. For automobiles noise, as much as 75 to 90-percent of traffic noise is generated by the interaction of the tires and pavement, especially when traveling at higher and constant speeds. (3) According to research conducted by Caltrans (26) and(18) the Canadian Ministry of Transportation and Highways (27) a 4 dBA reduction in tire/pavement noise is attainable using rubberized asphalt under typical operating conditions.

The effectiveness of reducing traffic noise levels is higher on roadways with low percentages of heavy trucks, since the heavy truck engine and exhaust noise is not affected by rubberized alternative pavement due to the truck engine and exhaust stack height above the pavement itself. (26) Per Caltrans guidance a truck stack height is modeled using a height of 11.5 feet above the road. (5) (28) With the primary off-site traffic noise source consisting of heavy trucks with a stack height of 11.5 feet off the ground, the tire/pavement noise reduction benefits associated rubberized asphalt will be primarily limited to autos. While the off-site Project-related traffic noise level increases would theoretically be reduced with the 4 dBA reduction provided by rubberized asphalt, the reduction would not provide reliable benefits for the noise levels generated by heavy truck traffic. This is, as previously stated, due to the noise source height difference between automobiles and trucks.

While rubberized asphalt could provide some nominal noise reduction, this noise study recognizes that rubberized asphalt is only effective for in the reduction of tire-on-pavement noise at higher speeds and would not materially reduce primary truck-related noise sources (e.g., truck engine noise and exhaust stack noise). Since the use of rubberized asphalt would not materially lower off-site traffic noise levels at potentially affected receptors, rubberized asphalt is not proposed as mitigation for the Project and the off-site Project-related traffic noise level increases at adjacent land uses would remain *significant.*

7.8.2 OFF-SITE NOISE BARRIERS

While noise barriers are commonly used to reduce the potential traffic noise levels from nearby transportation noise source activities, they are typically developed in coordination with new noise sensitive residential development or as part of a roadway widening project. Even though off-site noise barriers are typically not developed due to individual off-site projects that contribute to the cumulative off-site traffic noise levels off-site noise barriers were considered in this analysis as a potential traffic noise mitigation measure to reduce the Project-related impacts.

Off-site noise barriers are estimated to provide a *readily perceptible* 5 dBA reduction which, according to the FHWA, is *simple* to attain when blocking the line-of-sight from the noise source to the receiver. (5) Caltrans guidance in the Highway Design Manual, Section 1102.3 (28), indicates that for design purposes, *the noise barrier should intercept the line of sight from the exhaust stack of a truck to the receptor*, and an 11.5-foot-high truck stack height is assumed to represent the truck engine and exhaust noise source. (28) Therefore, any exterior noise barriers at receiving noise sensitive land uses experiencing Project-related traffic noise level increases would need to be high enough and long enough to block the line-of-sight from the noise source

(at 11.5 feet high per Caltrans) to the receiver (at 5 feet high per FHWA guidance) in order to provide a 5 dBA reduction per FHWA guidance it is not practical to construct 11.5 foot-high barriers at off-site locations along the Study Area roadways.

Additionally, arguably such barriers would block views from area land uses and would result in aesthetic and visual impacts affecting passersby that would off-set any noise attenuation benefits that may result from such walls. According to FHWA guidance, outdoor living areas are generally limited to outdoor living areas of frequent human use (e.g., backyards of single-family homes). Therefore, front and side yards of residences adjacent to off-site roadway segments do not represent noise sensitive areas of frequent human use that require exterior noise mitigation.

Lastly, the Applicant cannot autonomously construct off-site walls or other features at properties owned or controlled by others. As such, off-site noise barriers would not be feasible and would not lower the off-site traffic noise levels below a level of significance, and therefore, noise barriers are not proposed as mitigation for the Project.

7.8.3 SIGNIFICANT OFF-SITE TRAFFIC NOISE IMPACTS

Both rubberized asphalt and off-site noise barriers are considered as potential noise mitigation measures to reduce the *potentially significant* off-site traffic noise level increases shown on Tables 7-1 to 7-6. However, due the reasons outlined above neither form of mitigation is recommended for implementation since they would not meaningfully reduce the off-site traffic noise level increases at the adjacent land uses to the impacted roadway segments. Therefore, the Project-related off-site traffic noise level increases at adjacent noise-sensitive land uses are considered a *significant and unavoidable* impact.

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SENSITIVE RECEIVER LOCATIONS

To assess the potential for long-term stationary 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. 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 including land uses within the City of Perris 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. To describe the potential off-site Project noise levels, 23 receiver locations in the vicinity of the Project site were identified. This includes FUT-1 to FUT-8 representing potential future noise sensitive residential land uses and biological habitat locations BIO-1 to BIO-5 describing the Riverpark Mitigation Bank Parcels east of the Project site and for further consideration. The nearest noise sensitive residential receiver is located approximately 2,483 feet southeast of the Project site at 22125 Menifee Road. All the nearest noise sensitive receivers are in the unincorporated area within the County of Riverside. None of the nearest noise sensitive residential receivers are in the City of Perris.

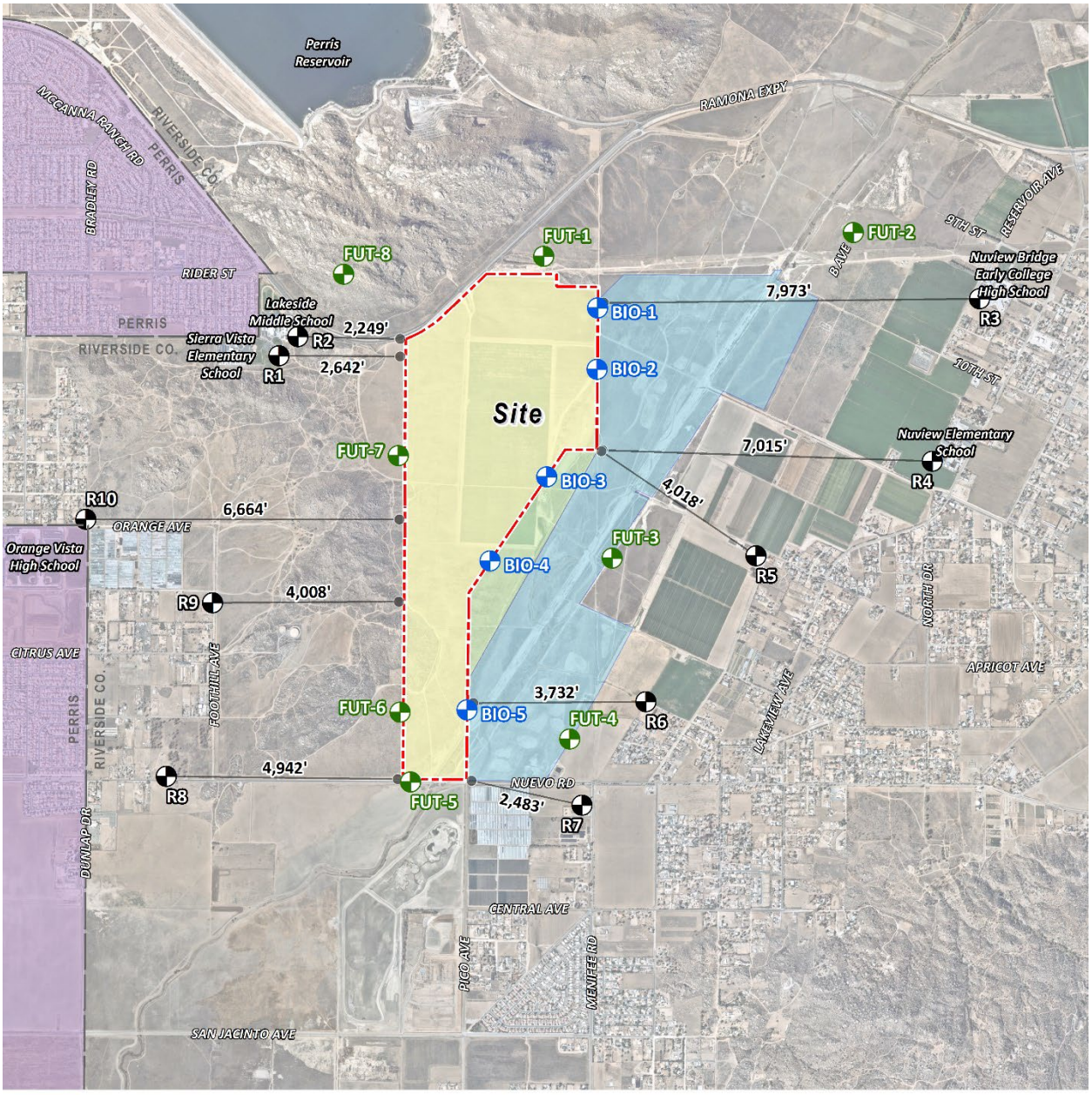
R1: Location R1 represents Sierra Vista Elementary School, approximately 2,780 feet west of the Project site. A 24-hour noise measurement was taken near this location, L1, to describe the existing ambient noise environment.

R2: Location R2 represents Lakeside Middle School, approximately 2,540 feet west of the Project site. A 24-hour noise measurement was taken near this location, L1, to describe the existing ambient noise environment.

R3: Location R3 represents Nuview Bridge Early College High School, approximately 7,973 feet east of the Project site. A 24-hour noise measurement was taken near this location, L4, to describe the existing ambient noise environment.

R4: Location R4 represents Nuview Elementary School, approximately 7,015 feet east of 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



R5: Location R5 represents the existing residence at 28900 Reservoir Avenue, approximately 4,018 feet east of the Project site. Receptor R5 is placed in the private outdoor living areas (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L5, to describe the existing ambient noise environment.

R6: Location R6 represents the existing residence at 28240 Green Valley Road, approximately 3,732 feet east of the Project site. Receptor R6 is placed in the private outdoor living areas (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L6, to describe the existing ambient noise environment.

R7: Location R7 represents the existing residence at 22125 Menifee Road, approximately 2,483 feet southeast of the Project site. Receptor R7 is placed in the private outdoor living areas (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L6, to describe the existing ambient noise environment.

R8: Location R8 represents the existing residence at 27304 Nuevo Road, approximately 4,942 feet west of the Project site. Receptor R8 is placed in the private outdoor living areas (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L8, to describe the existing ambient noise environment.

R9: Location R9 represents the existing residence at 21361 Foothill Avenue, approximately 4,008 feet west of the Project site. Since there are no private outdoor living areas facing the Project site, R9 is placed at the building façade facing the Project site. A 24-hour noise measurement was taken near this location, L1, to describe the existing ambient noise environment.

R10: Location R10 represents Orange Vista High School, approximately 6,664 feet west of the Project site. A 24-hour noise measurement was taken near this location, L1, to describe the existing ambient noise environment.

FUT-1: Location FUT-1 represents the potential future noise sensitive medium density residential land use located north of the Project site.

FUT-2: Location FUT-2 represents the potential future noise sensitive medium-high density residential land use located northeast of the Project site.

FUT-3: Location FUT-3 represents the potential future noise sensitive medium density residential land use located east of the Project site.

FUT-4: Location FUT-4 represents the potential future noise sensitive medium density residential land use located east of the Project site.

FUT-5: Location FUT-5 represents the potential future noise sensitive medium density residential land use located south of the Project site.

FUT-6: Location FUT-6 represents the potential future noise sensitive medium density residential land use located west of the Project site within the McCanna Hills Specific Plan.

FUT-7: Location FUT-7 represents the potential future noise sensitive medium density residential land use located west of the Project site within the McCanna Hills Specific Plan.

FUT-8: Location FUT-8 represents the potential future noise sensitive medium density residential land use located northwest of the Project site.

BIO-1: Location BIO-1 represents the limits of construction east of the Project site.

BIO-2: Location BIO-2 represents the limits of construction east of the Project site.

BIO-3: Location BIO-3 represents the boundary of the Riverpark Mitigation Bank Parcels approximately 649 feet southeast of the Project limits of construction.

BIO-4: Location BIO-4 represents the boundary of the Riverpark Mitigation Bank Parcels approximately 836 feet southeast of the Project limits of construction.

BIO-5: Location BIO-5 represents the limits of construction east of the Project site.

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 Stoneridge Commerce Center Specific Plan Project. Exhibit 9-A of the Noise Study includes over 885 individual noise sources to conservatively describe the potential worst-case noise environment. This includes a combination of noise sources such as loading dock activity, roof-top air conditioning units, trash enclosure activity, parking lot vehicle movements, truck movements, and drive-through speakerphone activity. Therefore, no screen walls or noise barriers were included in the following operational noise analysis. In addition, while the actual location and configuration of the loading docks cannot be reasonably known at this level of analysis, the operational noise analysis includes multiple loading docks within each industrial planning area.

9.1 OPERATIONAL NOISE SOURCES

This operational noise analysis is intended to describe noise level impacts associated with the expected typical of daytime and nighttime activities at the Project site. Since the noise source activities and locations for the noise generating industrial, commercial, and park land uses are not known currently, the underlying uses within the Specific Plan are used to describe the operational noise source activities. To describe the operational noise levels at the nearest noise sensitive receiver locations, a combination of potential noise sources are placed throughout the Project site to ensure that the analysis fully considers the potential uses permitted within the Specific Plan. 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, truck movements, and drive-through speakerphone activity.

9.2 REFERENCE NOISE LEVELS

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

9.2.1 MEASUREMENT PROCEDURES

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

ground elevation for each measurement. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (22)

EXHIBIT 9-A: OPERATIONAL NOISE SOURCE LOCATIONS

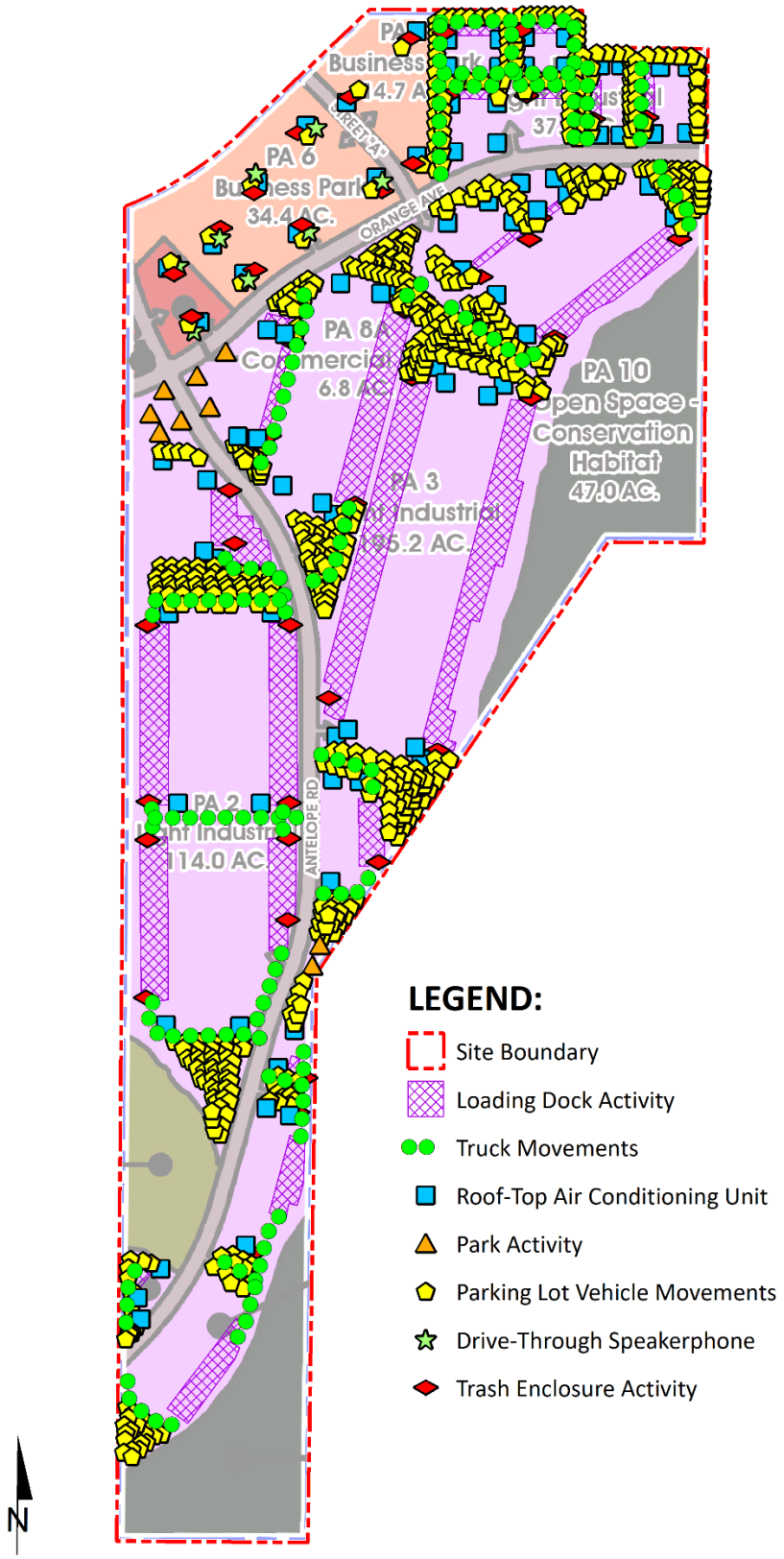


TABLE 9-1: REFERENCE NOISE LEVEL MEASUREMENTS

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	65.7	111.5
Roof-Top Air Conditioning Units	5'	39	28	57.2	88.9
Trash Enclosure Activity	5'	60	30	57.3	89.0
Parking Lot Vehicle Movements	5'	60	60	52.6	81.1
Truck Movements	8'	60	60	59.8	93.2
Drive-Through Speakerphone Activity	3'	60	60	50.0	84.0

[1] As measured by Urban Crossroads, Inc.

[2] Anticipated duration (minutes within the hour) of noise activity during typical hourly conditions expected at the Project site. "Daytime" = 7:00 a.m. - 10:00 p.m.; "Nighttime" = 10:00 p.m. - 7:00 a.m.

[3] Sound power level represents the total amount of acoustical energy (noise level) produced by a sound source independent of distance or surroundings. Sound power levels calculated using the CadnaA noise model at the reference distance to the noise source. Numbers may vary due to size differences between point and area noise sources.

9.2.2 LOADING DOCK ACTIVITY

The reference loading dock activities are intended to describe the typical outdoor operational noise activities associated with the Project. This includes truck idling, reefer activity (refrigerator truck/cold storage), deliveries, backup alarms, trailer docking including a combination of tractor trailer semi-trucks, two-axle delivery trucks, and background operation activities. Since the noise levels generated by cold storage loading dock activity can be slightly higher due to the use of refrigerated trucks or reefers. The reference noise level measurement was taken in the center of the loading dock activity area and represents multiple concurrent noise sources resulting in a combined noise level of 65.7 dBA L_{eq} at a uniform distance of 50 feet. Specifically, the reference noise level measurement represents one truck located approximately 30 feet from the noise level meter with another truck passing by to park roughly 20 feet away, both with their engines idling. Throughout the reference noise level measurement, a separate docked and running reefer truck was located approximately 50 feet east of the measurement location. Additional background noise sources included truck pass-by noise, truck drivers talking to each other next to docked trucks, and air brake release noise when trucks parked.

9.2.3 ROOF-TOP AIR CONDITIONING UNITS

The noise level measurements describe a single mechanical roof-top air conditioning unit. The reference noise level represents a Lennox SCA120 series 10-ton model packaged air conditioning unit. At the uniform reference distance of 50 feet, the reference noise level is 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.

9.2.5 PARKING LOT VEHICLE MOVEMENTS

To describe the on-site parking lot activity, a long-term reference noise level measurement was collected for twenty-nine hours in the center of activity within the staff parking lot of an Amazon warehouse distribution center. At 50 feet from the center of activity, the parking lot produced a reference noise level of 52.6 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 represent multiple heavy trucks entering and exiting the outdoor loading dock area producing a reference noise level of 59.8 dBA L_{eq} at 50 feet. The noise sources included at this measurement location account for trucks entering and existing the Project driveways and maneuvering in and out of the outdoor loading dock activity area.

9.2.7 DRIVE-THROUGH SPEAKERPHONE ACTIVITY

To describe the potential noise level impacts associated with the planned drive-thru speakerphones, this analysis relies on the drive-through intercom system manufactured by HME. This type of system is commonly used by the quick service restaurant (QSR) industry for drive-thru communications. The HME SPP2 speaker post intercom system produces a maximum noise level of 84 dBA at one foot from the speaker post. The system may also be equipped with an automatic volume control that can automatically reduce the sound levels as the ambient noise level decreases. The reference speakerphone noise level describes continuous drive-through operations and does not include any periods of inactivity.

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 including the planned screenwall 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, truck movements, and drive-through speakerphone activity, 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 as shown on Table 9-2 and 9-3.

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	R7	R8	R9	R10
Loading Dock Activity	41.2	42.2	34.8	35.7	41.0	43.5	43.0	36.7	39.9	35.1
Roof-Top Air Conditioning Units	27.4	28.2	17.3	18.4	22.9	23.2	21.8	19.5	23.5	19.9
Trash Enclosure Activity	24.7	25.6	12.9	14.0	18.9	20.6	19.6	15.4	20.2	16.5
Parking Lot Vehicle Movements	26.7	27.4	18.0	19.3	24.4	25.5	23.9	20.9	24.6	20.8
Truck Movements	24.3	24.7	16.1	18.0	24.0	26.4	26.4	21.5	24.7	20.1
Drive-Through Speakerphone Activity	15.0	16.2	0.0	0.0	2.1	0.1	0.0	1.0	6.7	4.7
Total (All Noise Sources)	**41.7**	**42.7**	**35.1**	**36.0**	**41.3**	**43.7**	**43.2**	**37.0**	**40.3**	**35.6**

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

Noise Source[1]	Operational Noise Levels by Receiver Location (dBA Leq)												
	FUT-1	FUT-2	FUT-3	FUT-4	FUT-5	FUT-6	FUT-7	FUT-8	BIO-1	BIO-2	BIO-3	BIO-4	BIO-5
Loading Dock Activity	58.3	38.4	47.2	45.9	48.5	55.5	46.2	45.4	40.4	54.6	53.0	61.7	54.6
Roof-Top Air Conditioning Units	37.4	21.2	27.7	24.4	24.8	36.4	33.9	29.2	36.8	34.5	31.8	33.7	29.8
Trash Enclosure Activity	33.8	16.5	24.6	22.6	17.4	22.5	32.7	27.5	21.0	34.0	29.0	46.2	30.7
Parking Lot Vehicle Movements	38.8	21.6	29.9	26.5	33.0	43.8	39.1	28.6	48.8	36.1	32.2	42.3	33.9
Truck Movements	37.7	19.1	29.7	29.2	33.8	44.6	36.2	26.0	34.0	34.7	29.7	49.8	40.4
Drive-Through Speakerphone Activity	15.7	0.0	5.3	0.0	0.0	1.6	18.3	17.8	0.0	9.7	8.8	5.1	1.6
Total (All Noise Sources)	**58.4**	**38.6**	**47.4**	**46.1**	**48.8**	**56.2**	**47.7**	**45.7**	**49.7**	**54.8**	**53.1**	**62.1**	**54.8**

[1] See Exhibit 9-A for the noise source locations. CadnaA noise model calculations are included in 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	R7	R8	R9	R10
Loading Dock Activity	41.2	42.2	34.8	35.7	41.0	43.5	43.0	36.7	39.9	35.1
Roof-Top Air Conditioning Units	25.0	25.8	14.9	16.0	20.5	20.8	19.4	17.1	21.1	17.4
Trash Enclosure Activity	24.7	25.6	12.9	14.0	18.9	20.6	19.6	15.4	20.2	16.5
Parking Lot Vehicle Movements	26.7	27.4	18.0	19.3	24.4	25.5	23.9	20.9	24.6	20.8
Truck Movements	24.3	24.7	16.1	18.0	24.0	26.4	26.4	21.5	24.7	20.1
Drive-Through Speakerphone Activity	15.0	16.2	0.0	0.0	2.1	0.1	0.0	1.0	6.7	4.7
Total (All Noise Sources)	**41.6**	**42.6**	**35.0**	**35.9**	**41.2**	**43.7**	**43.2**	**37.0**	**40.3**	**35.5**

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

Noise Source[1]	Operational Noise Levels by Receiver Location (dBA Leq)												
	FUT-1	FUT-2	FUT-3	FUT-4	FUT-5	FUT-6	FUT-7	FUT-8	BIO-1	BIO-2	BIO-3	BIO-4	BIO-5
Loading Dock Activity	58.3	38.4	47.2	45.9	48.5	55.5	46.2	45.4	40.4	54.6	53.0	61.7	54.6
Roof-Top Air Conditioning Units	35.0	18.8	25.3	22.0	22.4	34.0	31.5	26.8	34.4	32.1	29.4	31.3	27.4
Trash Enclosure Activity	33.8	16.5	24.6	22.6	17.4	22.5	32.7	27.5	21.0	34.0	29.0	46.2	30.7
Parking Lot Vehicle Movements	38.8	21.6	29.9	26.5	33.0	43.8	39.1	28.6	48.8	36.1	32.2	42.3	33.9
Truck Movements	37.7	19.1	29.7	29.2	33.8	44.6	36.2	26.0	34.0	34.7	29.7	49.8	40.4
Drive-Through Speakerphone Activity	15.7	0.0	5.3	0.0	0.0	1.6	18.3	17.8	0.0	9.7	8.8	5.1	1.6
Total (All Noise Sources)	**58.4**	**38.6**	**47.4**	**46.1**	**48.8**	**56.1**	**47.6**	**45.7**	**49.6**	**54.8**	**53.1**	**62.1**	**54.8**

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

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 35.1 to 43.7 dBA L_{eq} at the existing noise sensitive receiver locations, 38.6 to 58.4 dBA L_{eq} at the potential future noise sensitive receiver (FUT) locations, and 49.7 to 62.1 dBA L_{eq} at the nearby habitat (BIO) locations.

Table 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 35.0 to 43.7 dBA L_{eq} at the existing noise sensitive receiver locations, 38.6 to 58.4 dBA L_{eq} at the potential future noise sensitive receiver (FUT) locations, and 49.6 to 62.1 dBA L_{eq} at the nearby habitat (BIO) locations. 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.

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 County of Riverside exterior noise level standards at the existing nearby noise-sensitive receiver locations. Table 9-4 shows the operational noise levels associated with Stoneridge Commerce Center Specific Plan Project will not exceed the County of Riverside daytime and nighttime exterior noise level standards at the existing nearby noise-sensitive receiver locations. Therefore, the operational noise impacts are considered *less than significant* at the nearby noise-sensitive receiver locations.

Potential operational noise levels at receiver locations FUT-1 to FUT-8 and BIO-1 to BIO-5 are provided for informational purposes. A review of the potential operational noise level impacts at the future noise sensitive residential land uses (FUT-1 to FUT-8) suggests that unmitigated exterior noise levels will exceed the daytime and nighttime exterior noise level standards. Therefore, the operational noise levels at these potential future residential land use locations are considered *potentially significant* requiring the implementation of the following noise mitigation measures to reduce these potential impacts to *less than significant*.

MM NOISE-1: NOISE IMPACT ANALYSIS

Consistent with the County of Riverside *Good Neighbor Policy for Logistics and Warehouse/Distribution Uses*, all implementing projects within the Stoneridge Commerce Center Specific Plan shall be required to prepare a Noise Impact Analysis to evaluate potential project impacts to the neighboring properties. (29)

- The implementing noise impact analysis shall include construction and operations-related noise impacts, including stationary and off-site increases to ambient noise levels.
- The implementing noise impact analysis shall demonstrate that the site placement of stationary noise sources would not exceed the County of Riverside daytime and nighttime exterior noise level standards.

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	41.7	41.6	55	45	No	No
R2	42.7	42.6	55	45	No	No
R3	35.1	35.0	55	45	No	No
R4	36.0	35.9	55	45	No	No
R5	41.3	41.2	55	45	No	No
R6	43.7	43.7	55	45	No	No
R7	43.2	43.2	55	45	No	No
R8	37.0	37.0	55	45	No	No
R9	40.3	40.3	55	45	No	No
R10	35.6	35.5	55	45	No	No
FUT-1	58.4	58.4	-[5]	-[5]	-[5]	-[5]
FUT-2	38.6	38.6	-[5]	-[5]	-[5]	-[5]
FUT-3	47.4	47.4	-[5]	-[5]	-[5]	-[5]
FUT-4	46.1	46.1	-[5]	-[5]	-[5]	-[5]
FUT-5	48.8	48.8	-[5]	-[5]	-[5]	-[5]
FUT-6	56.2	56.1	-[5]	-[5]	-[5]	-[5]
FUT-7	47.7	47.6	-[5]	-[5]	-[5]	-[5]
FUT-8	45.7	45.7	-[5]	-[5]	-[5]	-[5]
BIO-1	49.7	49.6	-[5]	-[5]	-[5]	-[5]
BIO-2	54.8	54.8	-[5]	-[5]	-[5]	-[5]
BIO-3	53.1	53.1	-[5]	-[5]	-[5]	-[5]
BIO-4	62.1	62.1	-[5]	-[5]	-[5]	-[5]
BIO-5	54.8	54.8	-[5]	-[5]	-[5]	-[5]

[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?
[5] Project operational noise levels provided for informational purposes.
"Daytime" = 7:00 a.m. - 10:00 p.m.; "Nighttime" = 10:00 p.m. - 7:00 a.m.

- Warehouse/distribution facilities should be generally designed so that truck bays and loading docks are a minimum of 300 feet, measured from the property line of the sensitive receptor to the nearest dock door using a direct straight-line method.
- The implementing noise impact analysis shall verify that loading dock facilities, rooftop equipment, trash compactors and other stationary noise sources are adequately shielded and/or located at an adequate distance from residential areas in order to comply with the county's noise standards.

- Dock doors shall be located where they are not readily visible from sensitive receptors or major roads. If it is necessary to site dock doors where they may be visible, a method to screen the dock doors shall be implemented. A combination of landscaping, berms, walls, and similar features shall be considered**.**

9.6 PROJECT OPERATIONAL NOISE LEVEL INCREASES

To describe the Project operational noise level increases, the Project operational noise levels are combined with the existing ambient noise levels measurements for the nearby receiver locations 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. (3) 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 Table 9-5, the Project will generate a daytime operational noise level increases ranging from 0.0 to 0.7 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 2.0 dBA L_{eq} at the nearest receiver locations. Project-related operational noise level increases will not exceed the operational noise level increase significance criteria presented in Table 4-1, and, 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	41.7	L1	57.9	58.0	0.1	5.0	No
R2	42.7	L1	57.9	58.0	0.1	5.0	No
R3	35.1	L4	55.4	55.4	0.0	5.0	No
R4	36.0	L5	48.9	49.1	0.2	5.0	No
R5	41.3	L5	48.9	49.6	0.7	5.0	No
R6	43.7	L6	67.2	67.2	0.0	1.5	No
R7	43.2	L6	67.2	67.2	0.0	1.5	No
R8	37.0	L8	72.6	72.6	0.0	1.5	No
R9	40.3	L1	57.9	58.0	0.1	5.0	No
R10	35.6	L1	57.9	57.9	0.0	5.0	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	41.6	L1	50.9	51.4	0.5	5.0	No
R2	42.6	L1	50.9	51.5	0.6	5.0	No
R3	35.0	L4	44.9	45.3	0.4	5.0	No
R4	35.9	L5	43.7	44.4	0.7	5.0	No
R5	41.2	L5	43.7	45.7	2.0	5.0	No
R6	43.7	L6	64.7	64.7	0.0	5.0	No
R7	43.2	L6	64.7	64.7	0.0	5.0	No
R8	37.0	L8	69.7	69.7	0.0	1.5	No
R9	40.3	L1	50.9	51.3	0.4	5.0	No
R10	35.5	L1	50.9	51.0	0.1	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.

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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 on-site construction noise source activity including the off-site improvements in relation to the nearest sensitive receiver locations previously described in Section 8. According to Riverside County Ordinance No. 847 Regulating Noise Section 2i (Code Section 9.52.020[I]), noise associated with any private construction activity located within one-quarter of a mile from an inhabited dwelling is considered exempt between the hours of 6:00 a.m. and 6:00 p.m., during the months of June through September, and 7:00 a.m. and 6:00 p.m., during the months of October through May. (13) The City of Perris Municipal Code Section 7.34.060 limits construction activities to the hours of 7:00 a.m. to 7:00 p.m. on any day except Sundays and legal holidays (with the exception of Columbus Day and Washington's birthday).

In addition, neither the County of Riverside General Plan or County Code establish numeric maximum acceptable construction source noise levels at potentially affected receivers for CEQA analysis purposes. 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. The FTA considers a daytime exterior construction noise level of 80 dBA L_{eq} as a reasonable threshold for noise sensitive residential land use with a nighttime exterior construction noise level of 70 dBA L_{eq} (9 p. 179). The City of Perris Municipal Code, Section 7.34.060, noise level standard of 80 dBA L_{max} applies to residential zones within the City of Perris. (14)

While the City of Perris has adopted the noise level standard of 80 dBA L_{max}, this analysis relies on the FTA construction noise level of 80 dBA L_{eq} since L_{eq} considers the overall noise exposure and accounts for both high and low levels of noise during that period providing a more balanced representation of the construction noise exposure. Construction trips would occur throughout the construction period and would be associated with the delivery of building materials, supplies, and concrete to the Project Site. The construction trips will consist mostly of individual worker vehicles. However, it is expected that the individual worker vehicle construction noise source activities will be overshadowed by the construction noise source activities outlined below.

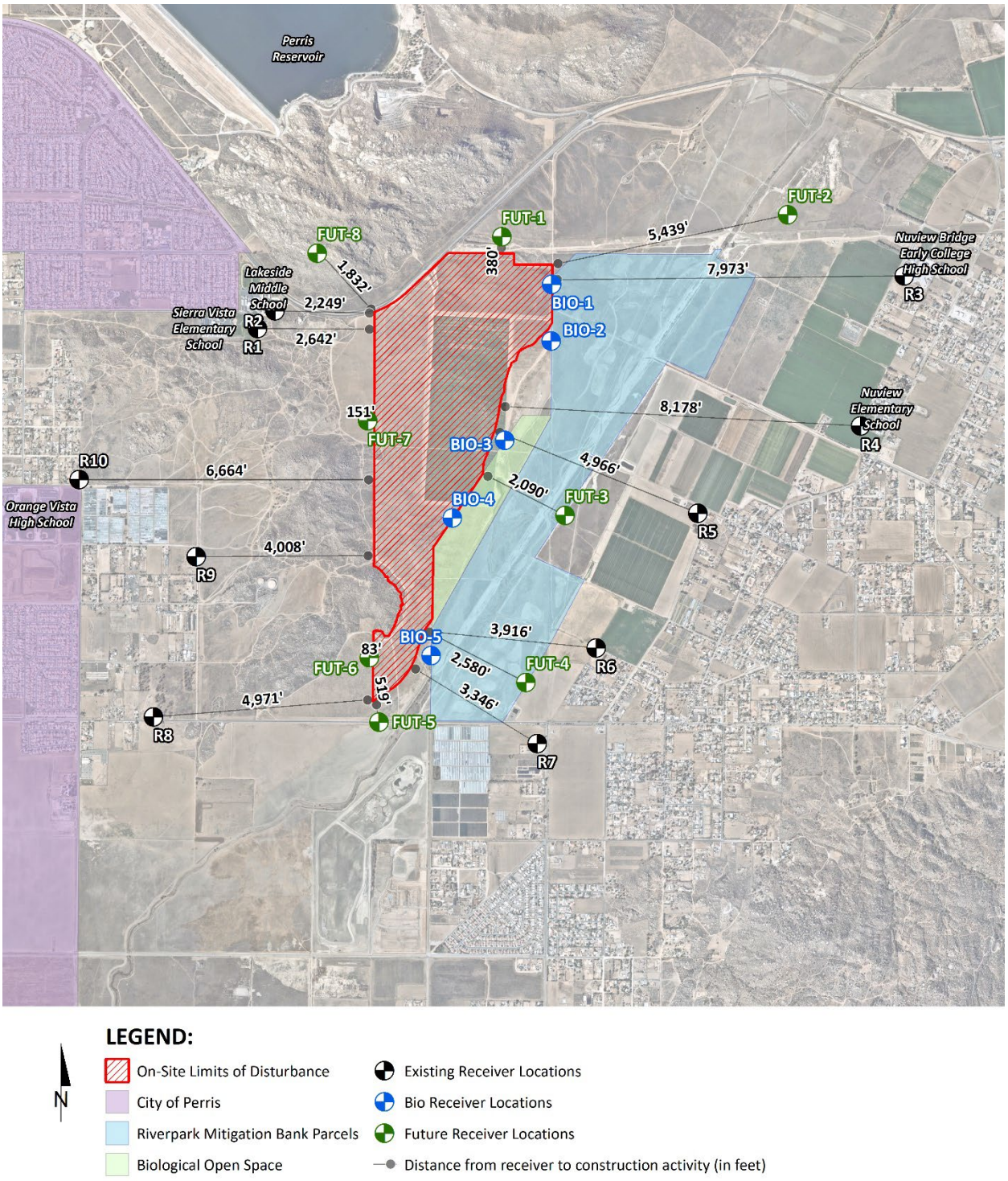
10.1 CONSTRUCTION NOISE LEVELS

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:

- Site Preparation
- Grading

- Building Construction
- Paving
- Architectural Coating

EXHIBIT 10-A: ON-SITE CONSTRUCTION NOISE SOURCE LOCATIONS



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. (30) 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.

10.3 ON-SITE 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 construction reference 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 30.3 to 48.6 dBA L_{eq} at the nearest existing noise sensitive receiver locations (R1 to R10). 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]
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: ON-SITE CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

	Construction Noise Levels (dBA L_{eq})

Receiver Location[1]	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Highest Levels[2]
R1	44.7	47.7	45.7	47.7	41.7	47.7
R2	45.6	48.6	46.6	48.6	42.6	48.6
R3	33.3	36.3	34.3	36.3	30.3	36.3
R4	35.2	38.2	36.2	38.2	32.2	38.2
R5	40.5	43.5	41.5	43.5	37.5	43.5
R6	42.1	45.1	43.1	45.1	39.1	45.1
R7	43.4	46.4	44.4	46.4	40.4	46.4
R8	38.9	41.9	39.9	41.9	35.9	41.9
R9	41.8	44.8	42.8	44.8	38.8	44.8
R10	37.2	40.2	38.2	40.2	34.2	40.2
FUT-1	49.7	52.7	50.7	52.7	46.7	52.7
FUT-2	36.8	39.8	37.8	39.8	33.8	39.8
FUT-3	45.6	48.6	46.6	48.6	42.6	48.6
FUT-4	45.7	48.7	46.7	48.7	42.7	48.7
FUT-5	58.3	61.3	59.3	61.3	55.3	61.3
FUT-6	53.3	56.3	54.3	56.3	50.3	56.3
FUT-7	57.4	60.4	58.4	60.4	54.4	60.4
FUT-8	45.9	48.9	46.9	48.9	42.9	48.9
BIO-1	62.1	65.1	63.1	65.1	59.1	65.1
BIO-2	53.4	56.4	54.4	56.4	50.4	56.4
BIO-3	53.6	56.6	54.6	56.6	50.6	56.6
BIO-4	52.5	55.5	53.5	55.5	49.5	55.5
BIO-5	58.7	61.7	59.7	61.7	55.7	61.7

[1] Construction noise source and receiver locations are shown on Exhibit 10-A.

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

10.4 On-Site Construction Noise Level Compliance

To evaluate whether the Project will generate potentially significant short-term noise levels at the nearest receiver locations, a construction-related daytime noise level 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 existing noise sensitive receiver locations (R1 to R10) will not exceed 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 the existing noise sensitive receiver locations and no construction noise mitigation is required due to the on-site Project construction activities. Potential construction noise level impacts associated with receiver locations FUT-1 to FUT-8 and BIO-1 to BIO-5 are provided for informational purposes only.

TABLE 10-3: ON-SITE CONSTRUCTION NOISE LEVEL COMPLIANCE

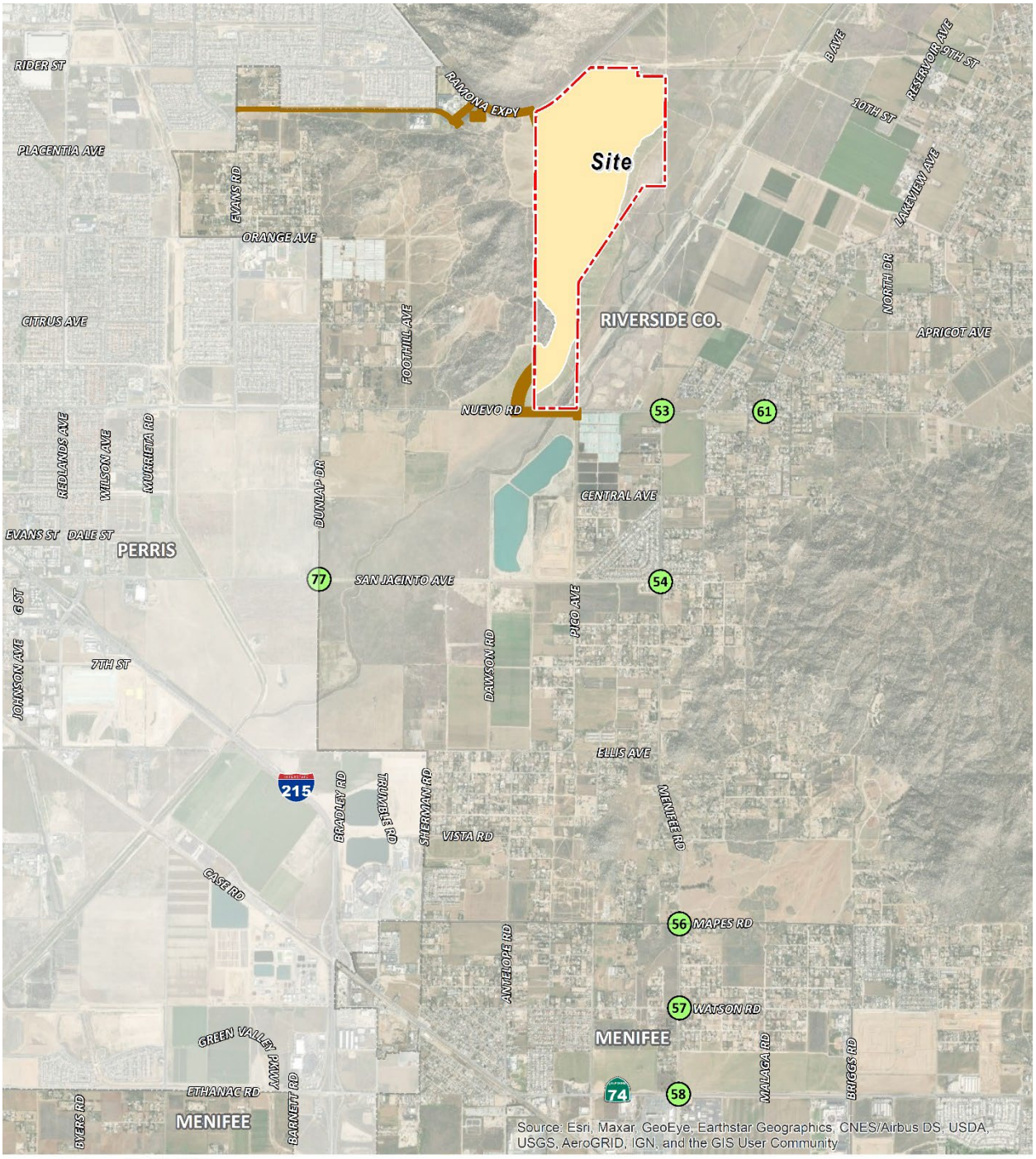
Receiver Location[1]	Construction Noise Levels (dBA L_{eq})		
	Highest Construction Noise Levels[2]	Threshold[3]	Threshold Exceeded?[4]
R1	47.7	80	No
R2	48.6	80	No
R3	36.3	80	No
R4	38.2	80	No
R5	43.5	80	No
R6	45.1	80	No
R7	46.4	80	No
R8	41.9	80	No
R9	44.8	80	No
R10	40.2	80	No
FUT-1	52.7	-[5]	-[5]
FUT-2	39.8	-[5]	-[5]
FUT-3	48.6	-[5]	-[5]
FUT-4	48.7	-[5]	-[5]
FUT-5	61.3	-[5]	-[5]
FUT-6	56.3	-[5]	-[5]
FUT-7	60.4	-[5]	-[5]
FUT-8	48.9	-[5]	-[5]
BIO-1	65.1	-[5]	-[5]
BIO-2	56.4	-[5]	-[5]
BIO-3	56.6	-[5]	-[5]
BIO-4	55.5	-[5]	-[5]
BIO-5	61.7	-[5]	-[5]

[1] Construction noise source and 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?
[5] Project construction noise levels provided for informational purposes.

10.5 Off-Site Roadway and Utility Improvements Construction Noise Analysis

To support the Project development, there will be grading, trenching, and paving for off-site improvements associated with roadway construction and utility installation for the Project as shown on Exhibit 10-B. This includes the installation of the proposed offsite water line adjacent to the Lakeside Middle School and residential land uses located north of Walnut Street. The loudest phase of construction associated with off-site roadway and utility improvements would likely be grading/excavation activities, which would generate similar noise levels compared to the grading/excavation phase of the proposed project's on-site construction activities previously outlined on Table 10-1.

EXHIBIT 10-B: OFF-SITE CONSTRUCTION NOISE SOURCE LOCATIONS



LEGEND:

N

- Site Boundary
- On-Site Limits of Disturbance
- Off-Site Limits of Disturbance
- Off-Site Intersection Improvement Location

To assess the off-site construction noise analysis from the installation of the proposed offsite water line, three off-site receivers (OFF1, OFF2 and OFF3) were identified at locations adjacent to the Lakeside Middle School, Sierra Vista Elementary School and the nearest residential land uses located north of Walnut Street. The off-site construction noise analysis includes the existing 5-foot-high noise barriers and the substantial existing topographical features that places the residential homes in the noise shadow zone approximately 27 feet below Walnut Street. The existing topography also places the nearest noise sensitive Sierra Vista Elementary School approximately 27 above Walnut Street. Receiver OFF1 representing the Lakeside Middle school is effectively located at grade with Walnut Street.

EXHIBIT 10-C: OFF-SITE CONSTRUCTION RECEIVER LOCATIONS

Table 10-4 shows that the unmitigated off-site construction noise levels at receiver locations OFF1, OFF2, and OFF3 will range from 56.0 to 64.1 dBA L_{eq}. The unmitigated off-site receivers will not exceed the reasonable daytime 80 dBA L_{eq} significance threshold during off-site Project construction activities. Therefore, the noise impacts due to off-site Project construction noise are considered *less than significant* and no construction noise mitigation is required due to the

off-site Project construction activities. Appendix 10.2 includes the CadnaA off-site construction noise calculations.

TABLE 10-4: OFF-SITE CONSTRUCTION NOISE ANALYSIS

Off-Site Receiver Location[1]	Off-Site Construction Noise Levels (dBA L_{eq})		
	Highest Construction Noise Levels[2]	Threshold[3]	Threshold Exceeded?[4]
OFF1	64.1	80	No
OFF2	57.2	80	No
OFF3	56.0	80	No

[1] Off-site construction receiver locations are shown on Exhibit 10-C.
[2] Based on the highest construction noise source level as shown on Table 10-2. Calculations included in Appendix 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?
[5] Project construction noise levels provided for informational purposes.

It is expected that the off-site construction activities would not take place at one location for the entire duration of construction. Construction noise from this off-site work would, therefore, be relatively short term and the noise levels would be reduced as construction work moves linearly along the existing public right-of-way and farther from sensitive uses. However, to minimize the potential construction noise impacts from the off-site roadway and utility Improvements, the Project shall implement the following construction noise abatement measures.

1. All construction activities shall comply with Riverside County Ordinance No. 847 Regulating Noise Section 2i (Code Section 9.52.020[I]), limiting construction activities to the hours of 6:00 a.m. and 6:00 p.m., during the months of June through September, and 7:00 a.m. and 6:00 p.m., during the months of October through May. (13) Any construction activity within the City of Perris shall comply with the Municipal Code, Section 7.34.060, limiting construction activities to the hours of 7:00 a.m. to 7:00 p.m. on any day except Sundays and legal holidays (with the exception of Columbus Day and Washington's birthday).
2. Construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards).
3. All stationary construction equipment shall be placed in such a manner so that the emitted noise is directed away from any sensitive receivers.
4. Construction equipment staging areas shall be located the greatest distance between the staging area and the nearest sensitive receivers.
5. The construction contractor shall limit equipment and material deliveries to the same hours specified for construction equipment outlined above.
6. Electrically powered air compressors and similar power tools shall be used, when feasible, in place of diesel equipment.
7. No music or electronically reinforced speech from construction workers shall be allowed.

With the implementation of these construction noise abatement measures, the potential impacts from the off-site roadway and utility Improvements would be reduced.

10.6 NIGHTTIME CONCRETE POUR NOISE ANALYSIS

It is our understanding that nighttime concrete pouring activities will occur as a part of Project building construction activities. Nighttime concrete pouring activities are often used to support reduced concrete mixer truck transit times and lower air temperatures than during the daytime hours and are generally limited to the actual building pad area. Since the nighttime concrete pours will take place outside the permitted by Riverside County Ordinance No. 847 Regulating Noise Section 2i (Code Section 9.52.020[I]), the Project Applicant will be required to obtain authorization for nighttime work from the County of Riverside. Any nighttime construction noise activities are evaluated against the FTA nighttime exterior construction noise level threshold of 70 dBA L_{eq} for noise sensitive residential land use (9 p. 179).

10.6.1 NIGHTTIME CONCRETE POUR REFERENCE NOISE LEVEL MEASUREMENTS

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

10.6.2 NIGHTTIME CONCRETE POUR NOISE LEVEL COMPLIANCE

As shown on Table 10-5, the noise levels associated with the nighttime concrete pour activities are estimated to range from 26.4 to 35.8 dBA L_{eq} at the existing noise sensitive receiver locations. Potential nighttime concrete pour construction noise level impacts associated with receiver locations FUT-1 to FUT-8 and BIO-1 to BIO-5 are provided for informational purposes only.

The analysis shows that the unmitigated nighttime concrete pour activities will not exceed the FTA 70 dBA L_{eq} nighttime residential noise level threshold at all the nearest noise sensitive receiver locations. Therefore, the noise impacts due to Project construction nighttime concrete pour noise activity are considered *less than significant* at all receiver locations with prior authorization for nighttime work from the County of Riverside. Appendix 10.3 includes the CadnaA nighttime concrete pour noise model inputs.

TABLE 10-5: NIGHTTIME CONCRETE POUR NOISE LEVEL COMPLIANCE

Receiver Location[1]	Concrete Pour Construction Noise Levels (dBA L_{eq})		
	Exterior Noise Levels[2]	Threshold[3]	Threshold Exceeded?[4]
R1	35.3	70	No
R2	35.8	70	No
R3	26.4	70	No
R4	27.7	70	No
R5	32.3	70	No
R6	33.5	70	No
R7	32.9	70	No
R8	29.3	70	No
R9	32.9	70	No
R10	28.7	70	No
FUT-1	47.4	-[5]	-[5]
FUT-2	30.1	-[5]	-[5]
FUT-3	37.5	-[5]	-[5]
FUT-4	35.6	-[5]	-[5]
FUT-5	39.1	-[5]	-[5]
FUT-6	48.8	-[5]	-[5]
FUT-7	45.3	-[5]	-[5]
FUT-8	36.6	-[5]	-[5]
BIO-1	52.2	-[5]	-[5]
BIO-2	45.3	-[5]	-[5]
BIO-3	42.6	-[5]	-[5]
BIO-4	48.6	-[5]	-[5]
BIO-5	44.3	-[5]	-[5]

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

10.7 CONSTRUCTION VIBRATION ANALYSIS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods employed. The 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 in Table 10-6. 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 10-6: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment	PPV (in/sec) at 25 feet
Small bulldozer	0.003
Jackhammer	0.035
Loaded Trucks	0.076
Large bulldozer	0.089
Vibratory Roller	0.210

Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual

10.8 ON-SITE CONSTRUCTION VIBRATION ANALYSIS

Table 10-7 presents the expected Project related vibration levels at the existing nearby receiver locations. At distances ranging from 2,249 to 8,178 feet from Project construction activities, construction vibration velocity levels are estimated at 0.000 in/sec PPV at the nearest existing noise sensitive receiver locations. Potential construction vibration levels associated with receiver locations FUT-1 to FUT-8 and BIO-1 to BIO-5 are provided for informational purposes only.

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 the existing 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.

10.9 OFF-SITE ROADWAY AND UTILITY IMPROVEMENTS VIBRATION ANALYSIS

To support the Project development, there will be grading, trenching, and paving for off-site improvements associated with roadway construction and utility installation for the Project previously shown on Exhibit 10-B. This includes the installation of the proposed offsite water line would occur adjacent Lakeside Middle School and residential land uses located along Walnut Street with the nearest residential building structures located over 25 feet from the off-site improvements on Walnut Street. Table 10-8 presents the estimated Project related vibration levels at distances ranging from 25 to 200 feet. As shown on Table 10-8, at distances ranging from 25 to 200 feet, the construction vibration velocity levels are estimated to range from 0.009 to 0.210 in/sec PPV. Based on maximum acceptable continuous vibration threshold of 0.3 PPV (in/sec), the off-site roadway and utility construction vibration levels will fall below the building damage thresholds. Therefore, the Project-related vibration impacts are considered *less than significant* during off-site roadway and utility improvements.

TABLE 10-7: ON-SITE PROJECT CONSTRUCTION VIBRATION LEVELS

Location[1]	Distance to Const. Activity (Feet)[2]	Typical Construction Vibration Levels PPV (in/sec)[3]						Thresholds PPV (in/sec)[4]	Thresholds Exceeded?[5]
		Small bulldozer	Jackhammer	Loaded Trucks	Large bulldozer	Vibratory Roller	Highest Vibration Level		
R1	2,642'	0.000	0.000	0.000	0.000	0.000	0.000	0.3	No
R2	2,249'	0.000	0.000	0.000	0.000	0.000	0.000	0.3	No
R3	7,973'	0.000	0.000	0.000	0.000	0.000	0.000	0.3	No
R4	8,178'	0.000	0.000	0.000	0.000	0.000	0.000	0.3	No
R5	4,966'	0.000	0.000	0.000	0.000	0.000	0.000	0.3	No
R6	3,916'	0.000	0.000	0.000	0.000	0.000	0.000	0.3	No
R7	3,346'	0.000	0.000	0.000	0.000	0.000	0.000	0.3	No
R8	4,971'	0.000	0.000	0.000	0.000	0.000	0.000	0.3	No
R9	4,008'	0.000	0.000	0.000	0.000	0.000	0.000	0.3	No
R10	6,664'	0.000	0.000	0.000	0.000	0.000	0.000	0.3	No
FUT-1	380'	0.000	0.001	0.001	0.002	0.004	0.004	0.3	No
FUT-2	5,439'	0.000	0.000	0.000	0.000	0.000	0.000	0.3	No
FUT-3	2,090'	0.000	0.000	0.000	0.000	0.000	0.000	0.3	No
FUT-4	2,580'	0.000	0.000	0.000	0.000	0.000	0.000	0.3	No
FUT-5	519'	0.000	0.000	0.001	0.001	0.002	0.002	0.3	No
FUT-6	83'	0.000	0.006	0.013	0.015	0.035	0.035	0.3	No
FUT-7	151'	0.000	0.002	0.005	0.006	0.014	0.014	0.3	No
FUT-8	1,832'	0.000	0.000	0.000	0.000	0.000	0.000	0.3	No

[1] Construction noise source and receiver locations are shown on Exhibit 10-A.
[2] Distance from receiver building facade to Project construction boundary (Project site boundary).
[3] Based on the Vibration Source Levels of Construction Equipment (Table 10-5).
[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

TABLE 10-8: OFF-SITE PROJECT CONSTRUCTION VIBRATION LEVELS

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	Vibratory Roller	Highest Vibration Level		
25'	0.003	0.035	0.076	0.089	0.210	0.210	0.3	No
50'	0.001	0.012	0.027	0.031	0.074	0.074	0.3	No
100'	0.000	0.004	0.010	0.011	0.026	0.026	0.3	No
200'	0.000	0.002	0.003	0.004	0.009	0.009	0.3	No

[1] Construction noise source and receiver locations are shown on Exhibit 10-A.
[2] Distance from receiver building facade to Project construction boundary (Project site boundary).
[3] Based on the Vibration Source Levels of Construction Equipment (Table 10-5).
[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

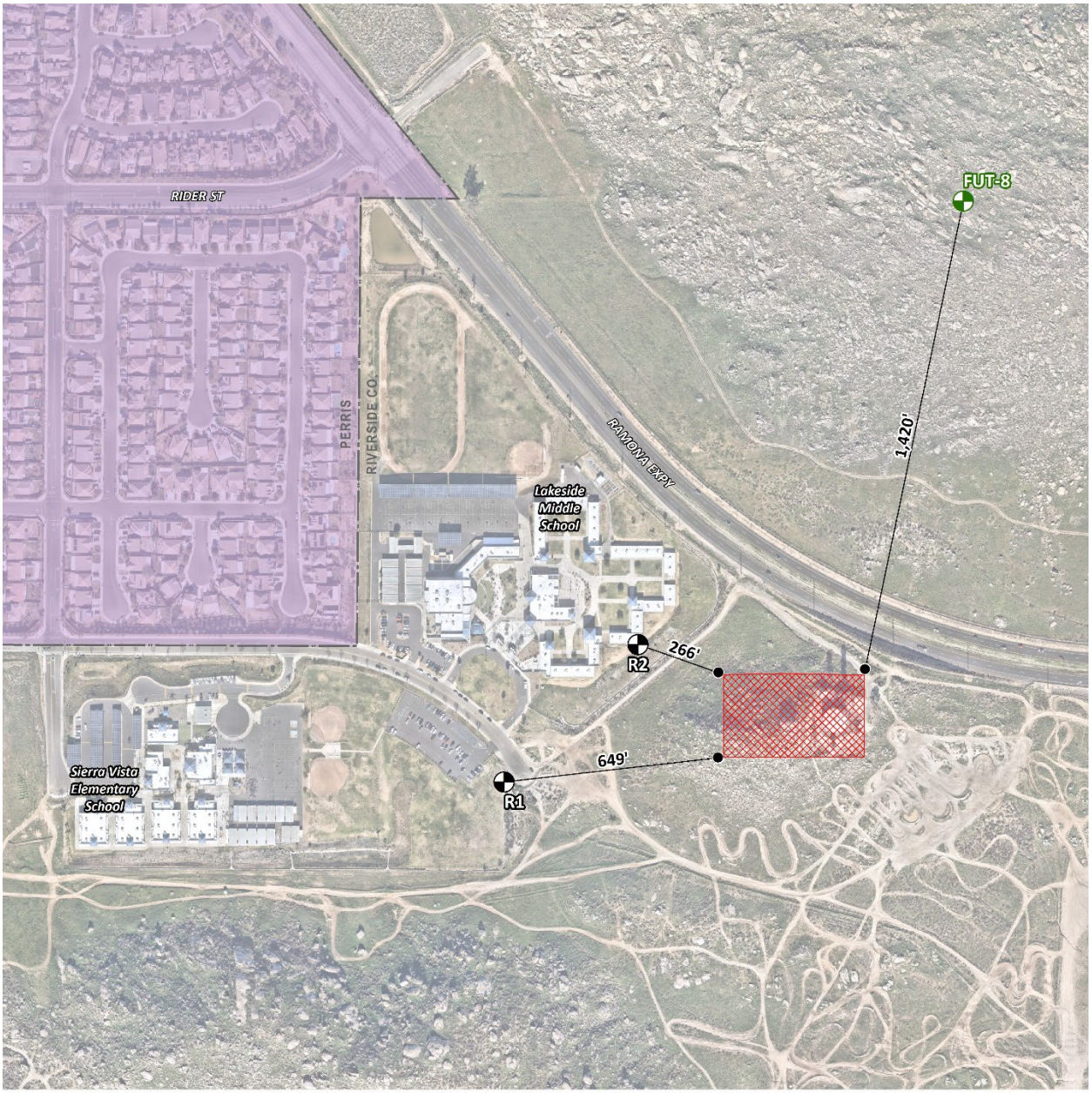
10.10 OFF-SITE BLASTING NOISE IMPACTS

Off-site Project construction blasting will be limited to the two off-site water towers as shown on Exhibit 10-D. The blasting is needed to remove the non-rippable materials at the water towers located off-site and south of the Lakeside Middle School. A blasting contractor would be required to complete all blasting-related activities in compliance with applicable regulations of the Riverside County Sheriff's Department, the U.S. Bureau of Mines, the California Division of Occupational Safety and Health (Cal-OHSA), the Department of Homeland Security, and the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF). As required by law a licensed blasting contractor would be responsible for performing and supervising all blasting activities, including the following:

- Drill pattern design;
- Pre-blast inspection;
- Loading of explosives;
- Pre-blast notifications and warning signaling;
- Blasting safety procedures;
- Blasting site security;
- Post-blast inspections and re-entry procedures; and
- Blast log and history.

Explosives used for blasting usually consist of a primer, secondary explosive, and an initiator. The blasting contractor would most likely use a high explosive Ammonia Gelatin as a primer for each shot and ammonium nitrate mixed with fuel oil (ANFO) as the primary blasting agent. Non-electric blasting caps are typically used to initiate the blasting agent. The charges are time delayed by at least 8-milliseconds. Delays between charges are used to decouple changes and reduce vibration. Pattern blasting is a common technique used in blasting for construction. This method is used when rock materials occur over a wide area. Pattern blasting involves drilling holes in a pre-designed pattern. The depth and spacing of holes is controlled to provide the maximum fracture with the minimum amount of ground shaking.

EXHIBIT 10-D: OFF-SITE CONSTRUCTION BLASTING LOCATION



Blasting patterns typically consist of drill holes between two and five inches in diameter. The depth of the drill holes would be determined by the blasting contractor and is specific to each application. Blasting patterns on construction sites typically range from three feet by three feet to 12 feet by 12 feet. The Blasting Engineer would control blasting-induced vibration and noise. General control measures include:

- Stemming shall be of uniform size in order to ensure consistency between individual shots;
- The weight of explosives used per delay shall be determined by adherence to the Scaled Distance Equation;
- Independent delays shall be used for each blast hole to control vibration; and
- Blasting shall not take place when wind velocity equals or exceeds 15 miles per hour. A licensed blasting contractor will determine wind speed through the use of a recording anemometer located a minimum of ten feet above ground level.

In addition, ground vibrations and air overpressure shall be monitored during each blast for compliance with the limits by the U.S. Bureau of Mines. Following each blast, seismographs shall be checked to ensure that the blasting has not exceeded relevant standards. The relevant standards are as follows:

- Pursuant to 30 CFR Ch. VII, §816.67(b)(1)(i) of U.S. Bureau of Mines publication RI8485, airblasts shall not exceed 133 dB at the location of any dwelling, public building, school, church, or community or institutional building outside the permit area.
- Pursuant to 30 CFR Ch. VII, §816.67(d)(2)(i) of U.S. Bureau of Mines publication RI8508, the maximum ground vibration shall not exceed the limits in said section at the location of any dwelling, public building, school, church, or community or institutional building outside the permit area.

To evaluate the potential noise levels from blasting activities during Project construction, the Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM) reference noise level of 94 dBA L_{max} is used at a reference distance of 50 feet. (30) Each blast represents a point-source of noise which attenuates at a rate of 6 dB for each doubling of distance from the source. The Lakeside Middle School represents the closest building structure to the off-site water tower blasting area represented by Receiver R2 located approximately 266 feet to the south. With the distance attenuation from the nearest blasting activities, the unmitigated noise levels at nearby receiver locations will range from 64.2 to 69.3 dBA L_{max}, as shown in Table 10-9. However, since the type of blasting techniques planned within the Project site were unknown at the time of this analysis, the noise levels presented at the nearby sensitive receiver locations represent the worst-case conditions based on the RCNM reference noise level.

The County of Riverside General Plan and County Code of Ordinances do not identify specific construction noise level limits for blasting activities. Therefore, the OSMRE and CFR lowest maximum Airblast Limit (30 CFR 816.67(b)) of 129 dBA L_{max} at nearby sensitive uses is used in this analysis as discussed in Section 3.6. (31) While some blasting noise may be noticeable by nearby noise sensitive receivers, the single-event, temporary noise levels generated by the blast will not exceed the OSMRE and the CFR standards for airblasts. Therefore, the noise levels due to blasting

activities will result in a *less than significant* noise impact. Appendix 10.4 includes the CadnaA blasting noise model inputs.

TABLE 10-9: BLASTING CONSTRUCTION NOISE LEVELS

Receiver Location[1]	Distance to Construction Activity (Feet)	Construction Noise Level (dBA Lmax)[2]
R1	266'	65.4
R2	649'	69.3
FUT-8	1,420'	64.2

[1] Off-site construction blasting, and receiver locations are shown on Exhibit 10-D.
[2] Based on FHWA Roadway Construction Noise Model reference noise level of 94 dBA L_{max}. CadnaA noise model calculations are included in Appendix 10.4.

10.11 BLASTING VIBRATION IMPACTS

Blasting operations can have unacceptable noise and vibration impacts if not conducted correctly. Excessive levels of structural vibration due to ground vibration from blasting can cause substantial damage to structures. A blasting contractor would be required to complete all blasting-related activities in compliance with applicable regulations of the Riverside County Sheriff's Department, the U.S. Bureau of Mines, the California Division of Occupational Safety and Health (Cal-OHSA), the Department of Homeland Security, and the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF), which have many requirements for the safe handling, use, and storage of explosives and recommend various measures and controls, including, but not limited to monitoring and reporting of each blast to verify no damage has occurred at nearby structures, notifications to surrounding neighbors, limitations on the amounts and times blast may occur.

Detonating as little as 25 pounds of explosives may be perceived up to 500 feet from a charge. Therefore, without vibration controls and measures, blasting could exceed thresholds at the areas near existing residential homes surrounding the Project site, shown on Exhibit 10-C. Noise-1 would mitigate potential vibration impacts. With the implementation of the following vibration controls, off-site blasting activities at sensitive receivers would be *less than significant*.

MM Noise-1: Blasting Limitations

Prior to approval of any grading permits that require blasting activities and a blasting permit, the Project Applicant shall prepare and submit for County review and approval of a Blasting Noise and Vibration Monitoring and Abatement Plan ("Noise and Vibration Abatement Plan"). The required Noise and Vibration Abatement Plan shall include the name and qualifications of the person(s) responsible for monitoring and reporting blast vibrations. In addition, the Noise and Vibration Abatement Plan shall require a minimum of three seismographs for monitoring peak ground vibration and air-overpressure. The Noise and Vibration Abatement Plan also shall require that equipment and its use shall conform fully to the standards developed by the Vibration Section of the International Society of Explosive Engineers (ISEE). For all blasts, the Noise and

Vibration Abatement Plan shall require monitoring of ground motion and air-overpressure at the nearest residential properties or other structure of concern. The Noise and Vibration Abatement Plan also shall specify a minimum trigger level for monitoring of 0.05 in/sec for ground motion and 120 dB for air-overpressure. Additionally, the Noise and Vibration Abatement Plan shall require regular reporting of blasting and measurements to Riverside County and shall include a copy of the instrument/software-generated blast monitoring report at each instrument location that includes measured peak particle velocity in inches per second, peak air-overpressure in linear-scale decibels, and vibration and air-overpressure event plots, with date and time of event recording. In addition, the Noise and Vibration Abatement Plan shall include the following requirements:

- Prior to commencement of any blasting, a pre-blast survey of the conditions of all existing property and aboveground utilities located within 300 feet of any potential blasting areas shall be conducted. The pre-blast survey shall include a photographic record of all visible and accessible structures, facilities, utilities, or other improvements. The survey shall document the interior and exterior conditions of all residential property and associated structures located within 500 feet of blasting areas. If property owners refuse surveys, provide copies of certified-mail letters documenting attempts to provide the survey by a third-party professional survey company. The required surveys shall include a description of the interior and exterior condition of the various structures examined. Descriptions shall include the locations of any cracks, damage, or other existing defects and shall include information needed to identify and describe the defect, if any, and to evaluate the construction operations on the defect. Survey records shall include photos of all cracks and other damaged, weathered, or otherwise deteriorated structural conditions. If necessary, macro lenses and flash illumination shall be used to ensure defects are shown clearly in the photographs. Photos shall contain an accurate date stamp. No blasting shall occur prior to completion of surveys of surrounding residential properties. Surveys also shall be repeated at facilities or properties where damage concerns have been expressed by individual residents, property owners, or other concerned parties. Details of any observed changes to surveyed structures and documenting photos shall be reported and submitted to Riverside County.
- Blasting only shall be allowed Monday through Friday only between the hours of 8:00 a.m. and 5:00 p.m.
- No blasting shall occur closer than 100 feet from residential structures. In the event that non-rippable materials are encountered within 100 feet from any residential structure, alternative methods shall be employed to reduce blasting-related noise and vibration impacts. Alternative rock blasting within 100 feet of residential homes may include methods such as the drilling of holes in the largest area of rock, inserting expansive grout or small charges into each whole to fragment the rock into smaller pieces, and then crushing the pieces for transport or other use.
- No more than a total of 2,000 pounds of explosive shall be detonated each day, excluding detonators.
- All blasts located within 500 feet of any structures or above ground utilities shall be covered with woven steel cable or steel-cable and rubber-tire blasting mats with a minimum weight of 30 pounds per square foot. Woven polypropylene or similar weed-barrier fabric, covered with at least 6 inches of soil or sand shall be placed over blast areas to protect initiators before mats are placed. Mats shall be overlapped at least 3 feet and shall completely cover the blast area and extend at least three feet beyond the blast area in all directions. If any flyrock or blasted material is thrown more than 10 feet or half the distance to the nearest structure, whichever is less,

blasting shall be suspended until the County's has approved a revised blasting plan showing revisions to assure adequate ground movement control.

- Before blasts are covered, all loose soils above the blast shall be removed where feasible. Remaining ground located within 20 feet of the blast shall be thoroughly wetted with water to suppress airborne dust. Sand or soils placed over weed-barrier fabric shall be similarly wetted before placing blast mats.
- If specified vibration limits are exceeded, blasting operations shall cease immediately and a revised blasting plan shall be submitted to the County. Blasting shall not resume until a revised blasting plan has been reviewed and the Contractor has expressed in writing the conditions that will be applied to further blasting work.

Project grading and blasting contractors shall be required to ensure compliance with the Noise and Vibration Abatement Plan requirements and shall permit periodic inspection of the construction site by County of Riverside staff or its designee to confirm compliance. The requirements of the Noise and Vibration Abatement Plan also shall be specified in bid documents issued to prospective construction contractors. Riverside County shall review all monitoring reports to ensure compliance with the Noise and Vibration Abatement Plan and shall have the authority to stop all blasting activities on site if it is determined that blasting activities are not being conducted in conformance with Noise and Vibration Abatement Plan and/or the above-listed requirements.

11 REFERENCES

1. **State of California.** *California Environmental Quality Act, Appendix G.* 2018.
2. **Urban Crossroads, Inc.** *Stoneridge Commerce Center Specific Plan (SP No. 239, A1) Traffic Impact Analysis.* January 2023.
3. **California Department of Transportation Environmental Program.** *Technical Noise Supplement - A Technical Supplement to the Traffic Noise Analysis Protocol.* Sacramento, CA : s.n., September 2013.
4. **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.
5. **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.
6. **U.S. Department of Transportation Federal Highway Administration.** *Highway Noise Barrier Design Handbook.* 2001.
7. **U.S. Department of Transportation, Federal Highway Administration.** *Highway Traffic Noise in the United States, Problem and Response.* April 2000. p. 3.
8. **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.
9. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment Manual.* September 2018.
10. **Office of Planning and Research.** *State of California General Plan Guidelines.* 2019.
11. **County of Riverside.** *General Plan Noise Element.* December 2015.
12. **City of Perris.** *General Plan Noise Element.* August 2005.
13. **County of Riverside.** *Municipal Code, Chapter 9.52 Noise Regulation.*
14. **City of Perris.** *Municipal Code, Chapter 7.34 Noise Control.*
15. **California Department of Transportation.** *Transportation and Construction Vibration Guidance Manual.* April 2020.
16. **International Society of Explosives Engineer's.** *Blasters' Handbook, 18th Edition.* 2014.
17. **County of Riverside.** *Airport Land Use Compatibility Plan.* October 2004.
18. **California Court of Appeal.** *Gray v. County of Madera, F053661.* 167 Cal.App.4th 1099; - Cal.Rptr.3d, October 2008.
19. **Federal Interagency Committee on Noise.** *Federal Agency Review of Selected Airport Noise Analysis Issues.* August 1992.
20. **California Department of Transportation.** *Technical Noise Supplement.* November 2009.
21. **Urban Crossroads, Inc.** *Ramona Gateway Noise Impact Analysis Comments.* May 2022.
22. **American National Standards Institute (ANSI).** *Specification for Sound Level Meters ANSI S1.4-2014/IEC 61672-1:2013.*
23. **U.S. Department of Transportation, Federal Highway Administration.** *FHWA Highway Traffic Noise Prediction Model.* December 1978. FHWA-RD-77-108.

24. **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.

25. **California Department of Transportation.** *Traffic Noise Attenuation as a Function of Ground and Vegetation Final Report.* June 1995. FHWA/CA/TL-95/23.

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

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

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

29. **County of Riverside, California Board of Supervisors Policy.** *"Good Neighbor" Policy for Logistics and Warehouse/Distribution Uses".* November 19, 2019.

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

31. **Regulations, Code of Federal.** *30 CFR 816.67 - Use of Explosives: Contorl of Adverse Effects.* July 2013.

12 CERTIFICATION

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

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EDUCATION

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

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

PROFESSIONAL REGISTRATIONS

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

PROFESSIONAL AFFILIATIONS

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

PROFESSIONAL CERTIFICATIONS

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

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APPENDIX 3.1:

COUNTY OF RIVERSIDE MUNICIPAL CODE

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APPENDIX 5.1:

STUDY AREA PHOTOS

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APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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APPENDIX 7.1:

OFF-SITE TRAFFIC NOISE LEVEL CALCULATIONS

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APPENDIX 9.1:

OPERATIONAL NOISE MODEL INPUTS

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APPENDIX 10.1:

CONSTRUCTION NOISE MODEL INPUTS

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APPENDIX 10.2:

OFF-SITE CONSTRUCTION NOISE MODEL INPUTS

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APPENDIX 10.3:

NIGHTTIME CONCRETE POUR NOISE MODEL INPUTS

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APPENDIX 10.4:

OFF-SITE BLASTING NOISE MODEL INPUTS

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