Freeway Corridor Specific Plan (FCSP) & Pacific Oak Commerce Center (POCC)

NOISE AND VIBRATION ANALYSIS

CITY OF YUCAIPA

PREPARED BY:

Bill Lawson, PE, INCE
blawson@urbanxroads.com
(949) 336-5979

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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
DEIR	Draft Environmental Impact Reports
EPA	Environmental Protection Agency
FCSP	Freeway Corridor Specific Plan
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
POCC	Pacific Oak Commerce Center
PPV	Peak Particle Velocity
Project	Freeway Corridor Specific Plan (FCSP) & Pacific Oak Commerce Center (POCC)
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, if any, for the proposed Freeway Corridor Specific Plan (FCSP) & Pacific Oak Commerce Center (POCC) development in the City of Yucaipa. The development would amend the FCSP and include the construction of two warehouse buildings and a truck trailer lot. This study has been prepared consistent with applicable City of Yucaipa noise standards, and significance criteria based on guidance provided by 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	*Less Than Significant*	-
Construction Noise	10	*Less Than Significant*	-
Nighttime Concrete Pour		*Less Than Significant*	-
Construction Vibration		*Less Than Significant*	-

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1 INTRODUCTION

This noise analysis has been completed to determine the noise impacts associated with the development of the proposed Freeway Corridor Specific Plan (FCSP) & Pacific Oak Commerce Center (POCC) . This noise study briefly describes the proposed program-level impacts associated with the FSCP and the project-level impacts associated with the POCC. The noise study 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 long-term stationary-source operational noise and short-term construction noise and vibration impacts.

1.1 SITE LOCATION

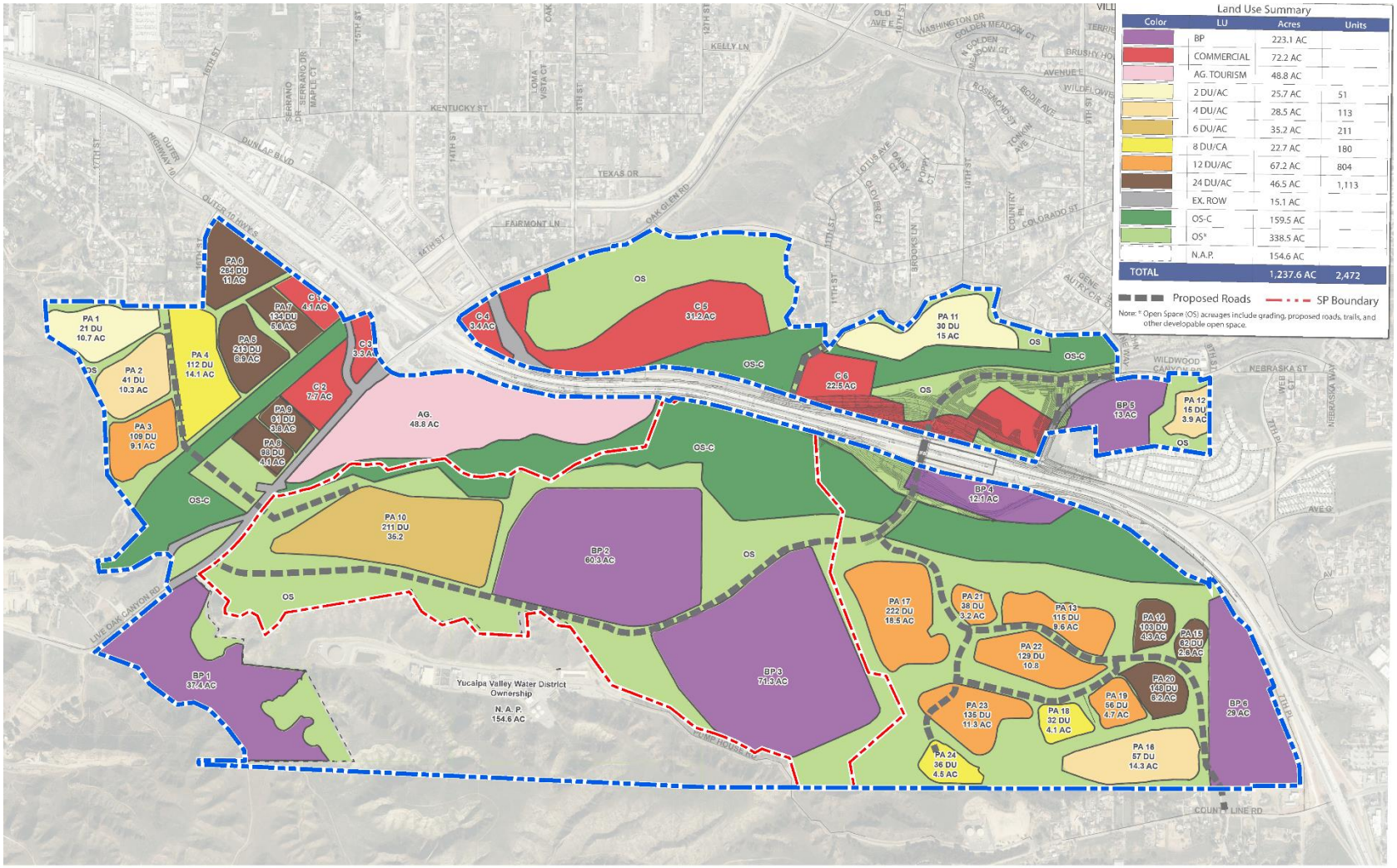
The proposed development site is bisected by Interstate 10 (I-10) and abuts Riverside County to the south. Regional access to the proposed site is provided by I-10 from the east and west. Local access is provided by Live Oak Canyon Road, County Line Road, Oak Glen Road, Wildwood Canyon Road, and Calimesa Boulevard. The proposed FSCP and focused POCC Project is in the City of Yucaipa. The nearest noise sensitive residential receivers are located approximately 1,048 feet north of the POCC Project site across the I-10 Freeway.

1.2 DEVELOPMENT DESCRIPTION

The FCSP update shown on Exhibit 1-A, would result in an increase of 25 dwelling units, a reduction of approximately 2.28 million square feet of Regional Commercial (RC), an increase of approximately 2.79 million square feet of Business Park (BP) from the previously approved FSCP. The update to the FCSP is intended to guide development within the 1,242-acre plan area. The FCSP update includes 2,472 residential dwelling units, approximately 1.1 million square feet of Regional Commercial, and 4 million square feet of Business Park uses. In addition, approximately 707 acres will be dedicated to Public Facilities, Agricultural Tourism, Open Space, and additional right-of-way.

The proposed POCC Project shown on Exhibit 1-B is within FCSP planning areas BP 2 and BP 3 and includes the development of two warehouse buildings and a truck trailer parking lot with 322 parking spaces. Building 1 would have 1,032,500 square feet of warehouse and 20,000 square feet of office use, for a total of 1,052,500 square feet of building space. Building 2 would have 981,500 square feet of warehouse and 20,000 square feet of office use, for a total of 1,001,500 square feet of building space. Exhibit 1-B illustrates a conceptual site plan of the proposed Pacific Oak Commerce Center. The on-site POCC Project-related noise sources are expected to include: cold storage loading dock activity, tractor trailer parking activity, roof-top air conditioning units, trash enclosure activity, parking lot vehicle movements, and truck movements.

EXHIBIT 1-A: FCSP & POCC LAND USE PLAN



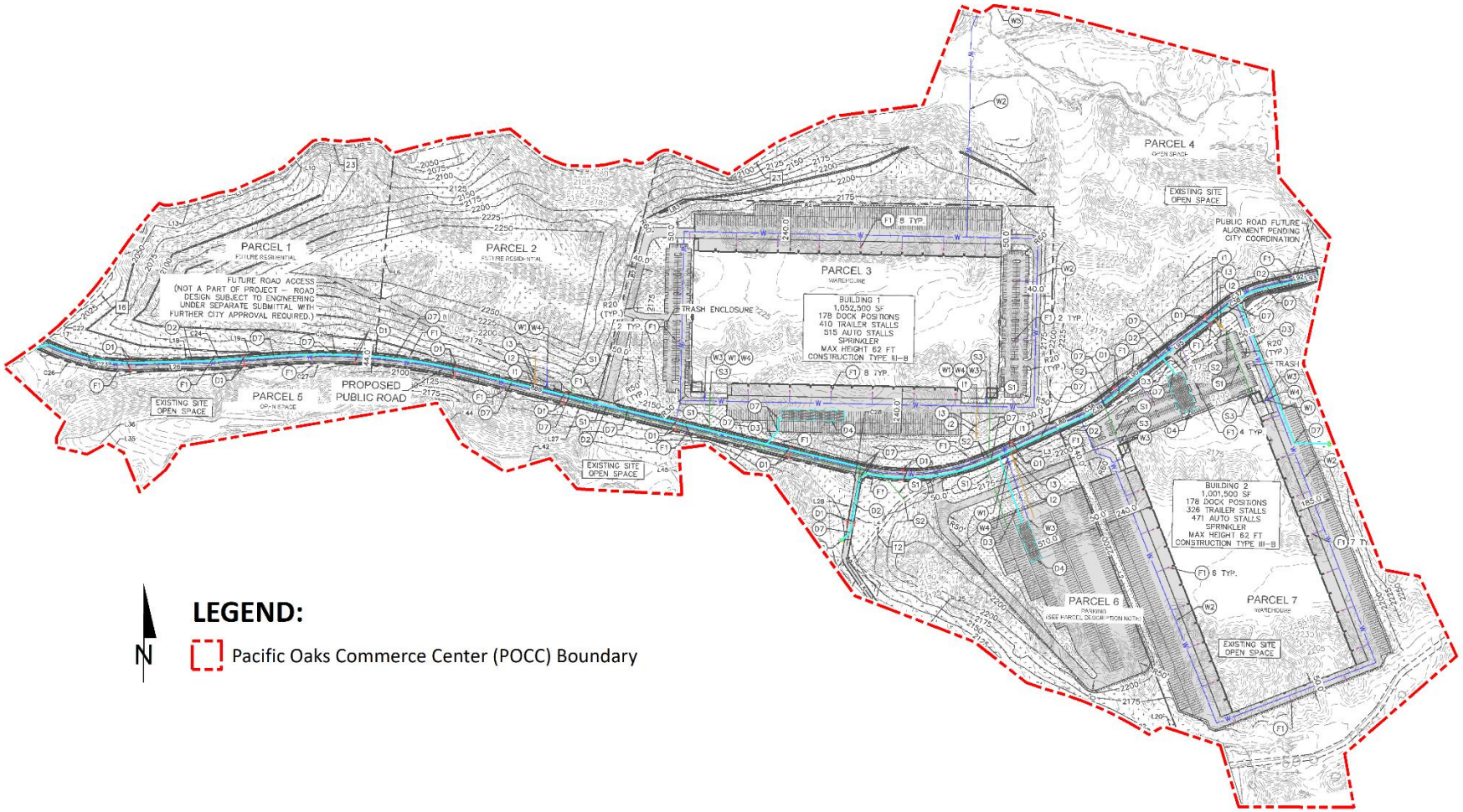
LEGEND:

N

Freeway Corridor Specific Plan (FCSP) Boundary

Pacific Oaks Commerce Center (POCC) Project Boundary

EXHIBIT 1-B: POCC PROJECT SITE PLAN



1.3 FCSP DEIR

On August 2008, the City of Yucaipa adopted the Revised Draft Environmental Impact Report (DEIR) for the Yucaipa Freeway Corridor Specific Plan. (2) Appendix F of the DEIR included the Environmental Noise Study for the FCSP prepared by Wieland Associates, Inc. (3) The FCSP Noise Environmental Noise Study outlined the following potential environmental noise impacts and mitigation measures to reduce or avoid impacts.

1.3.1 OFF-SITE TRAFFIC NOISE

The FCSP DEIR determined that implementation of the revised proposed Specific Plan would result in the exposure of persons to transportation-related noise levels in excess of standards established in the City of Yucaipa's General Plan. This *significant* impact would occur at existing off-site noise-sensitive properties adjacent to study area roadway segments. According to the DEIR traffic associated with implementation of the revised proposed Specific Plan would increase the Ldn above the threshold of significance and/or increase the ambient traffic noise level by a substantial amount at existing off-site noise-sensitive receptors. However, the DEIR found that it is not considered practical or feasible to mitigate these impacts, as it would require making alterations to private off-site properties over which applicants of future development projects would have no control.

1.3.2 OPERATIONAL NOISE

For the operational noise impacts from the Project, the DEIR found that implementation of the FCSP may result in exposure of persons to noise levels in excess of standards established in the City of Yucaipa's Municipal Code and Development Code. This potentially significant impact may occur at existing off-site noise-sensitive properties in the near vicinity of the proposed commercial land uses. Additionally, the FCSP DEIR would also result in a substantial permanent increase in ambient noise levels in the vicinity of the Specific Plan site above levels existing without the revised proposed Specific Plan as a result of activities on-site. Therefore, the permanent noise level increase would have a *significant* impact.

1.3.3 CONSTRUCTION NOISE

The FCSP DEIR determined that the Municipal Code exempts temporary construction, repair, and demolition activities from the noise level limits, providing the activity occurs between 7:00 a.m. and 7:00 p.m. on Monday through Saturday. There will be no construction activities on Sundays or legal holidays. As a result, the DEIR found that the impact of construction noise would be *less than significant*.

1.3.4 CONSTRUCTION VIBRATION

The primary vibratory source during the construction of future development projects on the Specific Plan site would be large bulldozers. However, the impact would be considered *less than significant* because of the short duration of the activity, and because the vibration levels would be well below the threshold of building damage.

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. (4) The most common sounds vary between 40 dBA (very quiet) to 100 dBA (very loud). Normal conversation at three feet is roughly at 60 dBA, while loud jet engine noises equate to 110 dBA

at approximately 100 feet, which can cause serious discomfort. (5) Another important aspect of noise is the duration of the sound and the way it is described and distributed in time.

2.2 NOISE DESCRIPTORS

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

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

2.3 SOUND PROPAGATION

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

2.3.1 GEOMETRIC SPREADING

Sound from a localized source (i.e., a stationary point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a line source. (4)

2.3.2 GROUND ABSORPTION

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

sufficiently accurate for distances of less than 200 ft. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a parking lot or body of water), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receiver such as soft dirt, grass, or scattered bushes and trees), an excess ground attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance from a line source. (6)

2.3.3 ATMOSPHERIC EFFECTS

Receivers located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects. (4)

2.3.4 SHIELDING

A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Shielding by trees and other such vegetation typically only has an "out of sight, out of mind" effect. That is, the perception of noise impact tends to decrease when vegetation blocks the line-of-sight to nearby residents. However, for vegetation to provide a substantial, or even noticeable, noise reduction, the vegetation area must be at least 15 feet in height, 100 feet wide and dense enough to completely obstruct the line-of sight between the source and the receiver. This size of vegetation may provide up to 5 dBA of noise reduction. The 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 up to 10 to 15 dBA, cutting the loudness of traffic noise in half. A noise barrier is most effective when placed close to the noise source or receiver. Noise barriers, however, do have limitations. For a noise barrier to work, it must be high enough and long enough to block the path of the noise source. (6)

2.6 LAND USE COMPATIBILITY WITH NOISE

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

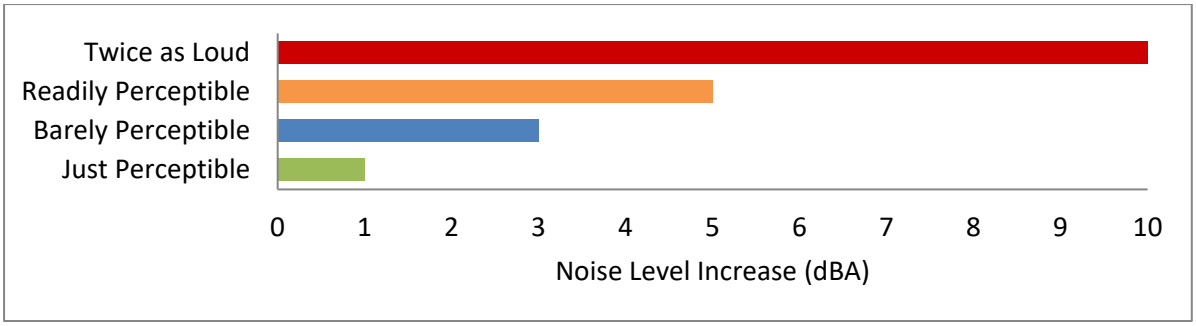
2.7 COMMUNITY RESPONSE TO NOISE

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

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

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

EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION



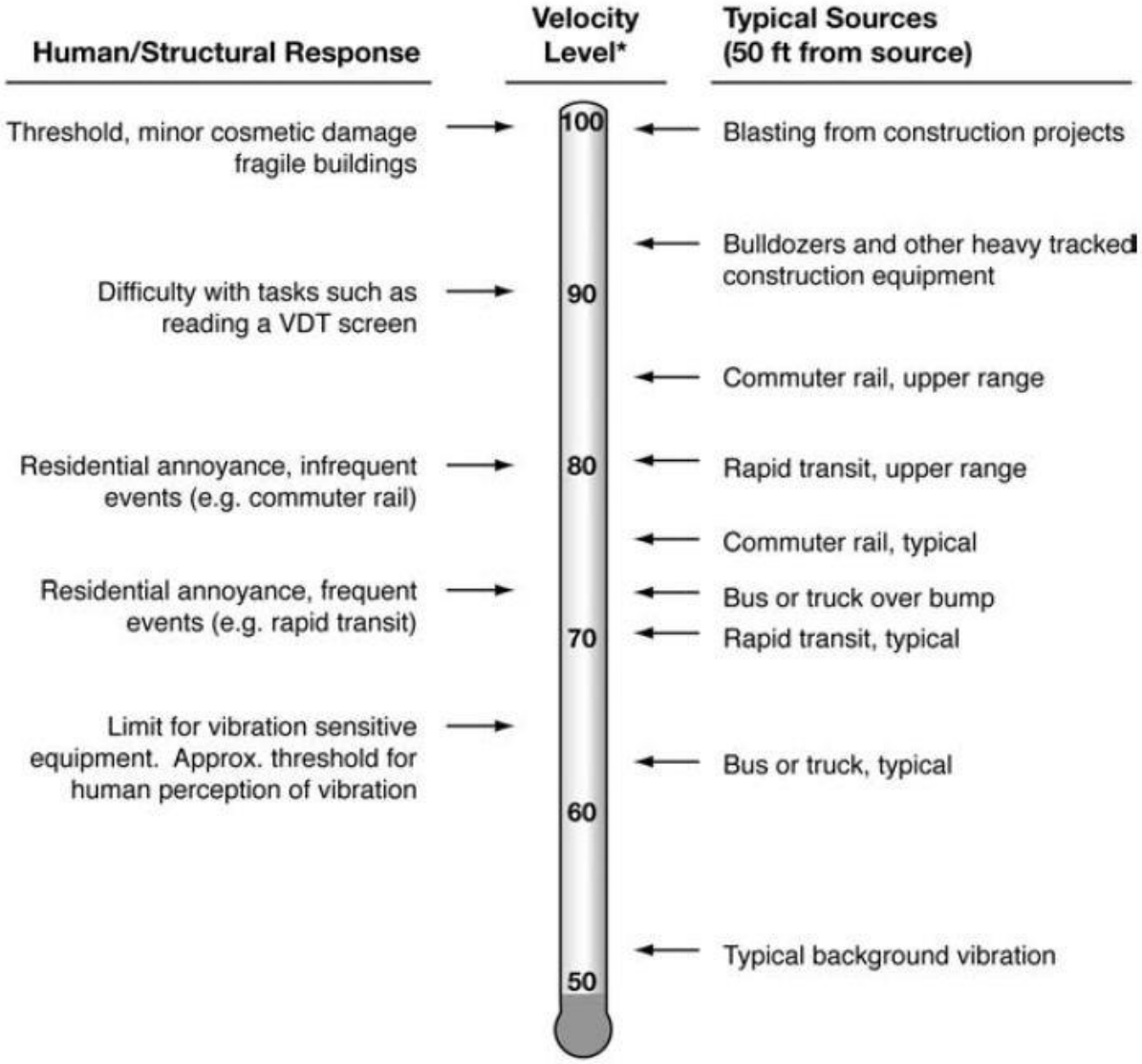
2.8 VIBRATION

Per the Federal Transit Administration (FTA) *Transit Noise 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 CITY OF YUCAIPA PUBLIC SAFETY ELEMENT

The City of Yucaipa has adopted a Noise Hazards Chapter in the Public Safety Element of the General Plan to protect residents and visitors from unacceptable noise and vibration. (11) The state and federal government regulate sources of noise from transportation sources or the workplace. Therefore, the City of Yucaipa works to control noise through the following policies:

Policy S-6.1 *Noise Assessment: Assess the compatibility of proposed land uses with the noise environment when preparing, revising, or reviewing applications for development projects or land use changes.*

Policy S-6.2 *Acoustical Studies: Require acoustical studies for proposed projects within areas that exceed 60 dBA; discourage siting of new noise-sensitive uses in areas exceeding 65 dBA without appropriate mitigation.*

Policy S-6.3 *Noise Insulation and Vibration Standards:* Require new projects to comply with noise insulation and vibration reduction standards in local, regional, state, and federal regulations, as applicable.

Policy S-6.4 *Noise Nuisance Standards: Regulate the control of residential noise nuisances—such as parties, barking dogs, other animals, and limited agricultural operations—through the City's municipal code.*

Policy S-6.5 *Development Patterns: Locate new development in areas where noise levels are appropriate for the use. Limit development of noise-producing uses adjacent to noise-sensitive receptors and require that noise-producing land uses have adequate mitigation.*

Policy S-6.6 Land Use-Noise Compatibility: Require mitigation of exterior and interior noise to the levels in Table S-1. Encourage the use of building design, site planning, landscaping, and other features to reduce noise levels.

Policy S-6.7 Vibration Reduction: Minimize vibration impacts from construction sites, roadways, and other sources with a combination of setbacks, structural design features, and operational regulations as appropriate.

Policy S-6.8 Street Improvements to Reduce Noise: Employ noise mitigation practices and materials when designing or improving streets; emphasize use of natural buffers or setbacks between roads and noise-sensitive areas.

3.2.1 LAND USE COMPATIBILITY

The City of Yucaipa has adopted a Public Safety Element of the General Plan to protect residents and visitors from unacceptable noise and vibration. Potential noise sources are identified in the Public Safety Element and implementation strategies established to avoid or mitigate noise impacts from planned development. (11). The Noise Element typically provides the standards for land use compatibility for community noise exposure. However, the City of Yucaipa General Plan does not include specific transportation-related noise standards. While the General Plan provides background and noise fundamentals, it does not identify criteria to assess the impacts associated with transportation-related noise impacts. Therefore, for this analysis, the transportation noise criteria are derived from standards contained in the California Office of Planning and Research (OPR) *General Plan Guidelines*. (10) The OPR land use/noise compatibility standards are used by many California cities and counties and specify the maximum noise levels allowable for new developments impacted by transportation noise sources. The OPR land use/noise compatibility criteria, found in Figure 2 of the *General Plan Guidelines, Appendix D: Noise Element Guidelines,* are shown on Exhibit 3-A.

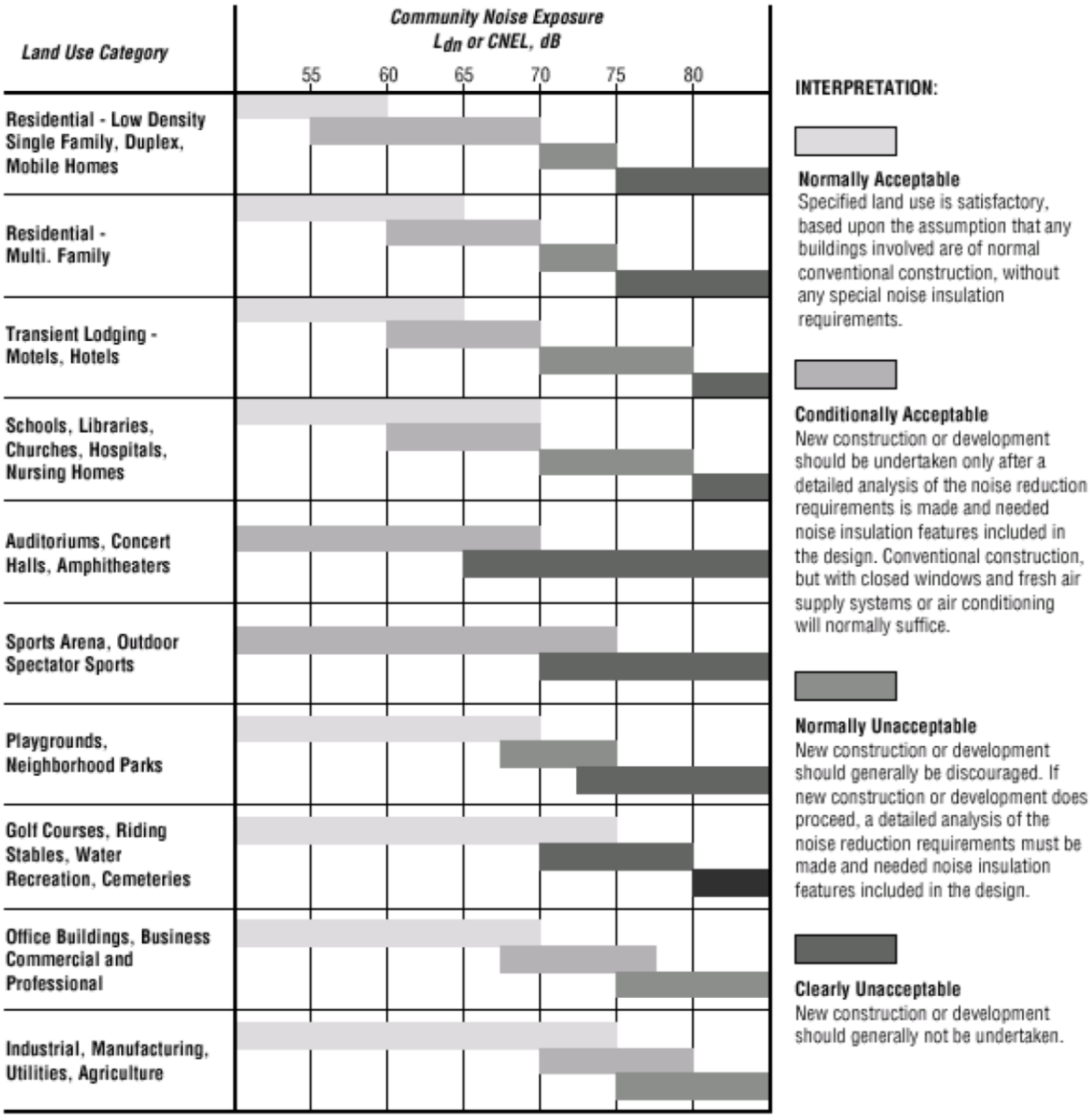
When unmitigated exterior noise levels approaching 70 dBA CNEL, school land use is considered *normally acceptable*. With exterior noise levels ranging from 60 to 70 dBA CNEL, schools land uses are considered *conditionally acceptable*, and with exterior noise levels greater than 70 dBA CNEL, they are considered *normally unacceptable*. For *normally unacceptable* land use, *new construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.* (10)

3.3 OPERATIONAL NOISE STANDARDS

To analyze noise impacts originating from a designated fixed location or private property such as the Project, stationary-source (operational) noise such as the expected cold storage loading dock activity, tractor trailer parking activity, roof-top air conditioning units, trash enclosure activity, parking lot vehicle movements, and truck movements are typically evaluated against standards established under a jurisdiction's Municipal Code or General Plan. For noise-sensitive residential property, the City of Yucaipa Municipal Code, Chapter 87.0905[b][1], identifies exterior noise levels standards of 55 dBA L_{eq} for the daytime hours (7:00 a.m. to 10:00 p.m.) and 55 dBA L_{eq} during the nighttime (10:00 p.m. to 7:00 a.m.) hours. For professional services the city identifies

a 55 dBA L_{eq} exterior noise standard, 60 dBA L_{eq} for other commercial and 70 dBA L_{eq} for industrial land uses. The City of Yucaipa Municipal Code Noise Standards are included in Appendix 3.1.

EXHIBIT 3-A: LAND USE NOISE COMPATIBILITY CRITERIA



Source: OPR General Plan Guidelines, Appendix D: Noise Element Guidelines, Figure 2.

3.4 CONSTRUCTION NOISE STANDARDS

The City of Yucaipa has set restrictions to control noise impacts associated with the construction of the proposed Project. According to Chapter 87.0905[e][1][c] of the City's Municipal Code exempts: *Temporary Construction, repair, or demolition activities between 7 a.m. and 7 p.m., except Sundays and Federal holidays.* (12) Project construction noise levels are, therefore, considered exempt from municipal regulation if activities occur within the hours specified in the City of Yucaipa Municipal Code, Chapter 87.0905 of 7:00 a.m. to 7:00 p.m., except Sundays and Federal holidays. However, neither the City of Yucaipa General Plan or Municipal Codes establish numeric maximum acceptable construction source noise levels at potentially affected receivers, which would allow for a quantified determination of what CEQA constitutes a *substantial temporary or periodic noise increase*. 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)

3.5 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)

Chapter 87.0910[c][1][B] of the City's Municipal Code exempts *temporary construction, maintenance, or demolition activities between 7am and 7pm, except Sundays and Federal holidays.* However, to analyze vibration impacts originating from the operation and construction of the Freeway Corridor Specific Plan (FCSP) & Pacific Oak Commerce Center (POCC), vibration-generating activities are appropriately evaluated against standards established under a City's Municipal Code. Under the City of Yucaipa's Municipal Code, Chapter 87.0910[a] no ground vibration is allowed which can be felt without the aid of instruments at or beyond the lot line, or which produces a particle velocity greater than or equal to two-tenths (0.2) inch per second measured at or beyond the lot line. (11) (13)

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.* (14) 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 City of Yucaipa land use compatibility standards, as discussed below.

4.1.1 NOISE-SENSITIVE RECEIVERS

The Federal Interagency Committee on Noise (FICON) (15) 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. (14) 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 at noise sensitive receiver locations are consistent with guidance provided by both the Federal Highway Administration (6 p. 9) and Caltrans (16 p. 2_48).

4.1.2 NON-NOISE-SENSITIVE RECEIVERS

The OPR land use/noise compatibility standards were used to establish the satisfactory noise levels of significance for non-noise-sensitive land uses in the Project study area. As previously shown on Exhibit 3-A, the *normally acceptable* exterior noise level for non-noise-sensitive land use is 70 dBA CNEL. 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 OPR land use/noise compatibility standards *normally acceptable* 70 dBA CNEL exterior noise level criteria.

4.2 VIBRATION (THRESHOLD B)

As described in Section 3.5, the vibration impacts originating from the construction of Freeway Corridor Specific Plan (FCSP) & Pacific Oak Commerce Center (POCC), vibration-generating activities are appropriately evaluated using the peak particle velocity (PPV) threshold of 0.2 inches per second as outlined in the City of Yucaipa Municipal Code, Chapter 87.0910[a]. (11) (13)

4.3 CEQA GUIDELINES NOT FURTHER ANALYZED (THRESHOLD C)

CEQA Noise Threshold C applies when there are nearby public and private airports and/or air strips and focuses on land use compatibility of the Project to nearby airports and airstrips. The Project site is not located within two miles of an airport or airstrip. The closest airport is the San Bernardino International Airport (SBD) located roughly 9 miles northwest of the Project site. As such, the Project site would not be exposed to excessive noise levels from airport operations, and therefore, impacts are considered *less than significant,* and no further noise analysis is conducted in relation to Appendix G to the CEQA Guidelines, Noise Threshold C.

4.4 SIGNIFICANCE CRITERIA SUMMARY

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

TABLE 4-1: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Receiving Land Use	Condition(s)	Significance Criteria	
			Daytime	Nighttime
Off-Site 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}	
		If ambient is < 60 dBA L_{eq}[1]	≥ 5 dBA L_{eq} Project increase	
		If ambient is 60 - 65 dBA L_{eq}[1]	≥ 3 dBA L_{eq} Project increase	
		If ambient is > 65 dBA L_{eq}[1]	≥ 1.5 dBA L_{eq} Project increase	
Construction	Noise-Sensitive	Noise Level Threshold[4]	80 dBA L_{eq}	70 dBA L_{eq}
		Vibration Level Threshold[5]	0.2 PPV (in/sec)	

[1] FICON, 1992.
[2] OPR land use/noise compatibility standards.
[3] City of Yucaipa Municipal Code, Chapter 87.0905[b][1] (Appendix 3.1)
[4] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual.
[5] City of Yucaipa Municipal Code, Chapter 87.0910[a] (Appendix 3.1)
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

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5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, 24-hour noise level measurements were taken at seven 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 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, April 6th, 2023. 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. (17)

5.2 NOISE MEASUREMENT LOCATIONS

The long-term noise level measurements were positioned as close to the nearest sensitive receiver locations identified in Section 6 as possible to assess the existing ambient hourly noise levels surrounding the Project site. Both Caltrans and the FTA recognize that it is not reasonable to collect noise level measurements that can fully represent every part of a private yard, patio, deck, or balcony normally used for human activity when estimating impacts for new development projects. This is demonstrated in the Caltrans general site location guidelines which indicate that *sites must be free of noise contamination by sources other than sources of interest. Avoid sites located near sources such as barking dogs, lawnmowers, pool pumps, and air conditioners unless it is the express intent of the analyst to measure these sources*. (4) Further, FTA guidance states, t*hat it is not necessary nor recommended that existing noise exposure be determined by measuring at every noise-sensitive location in the project area. Rather, the recommended approach is to characterize the noise environment for clusters of sites based on measurements or estimates at representative locations in the community*. (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.

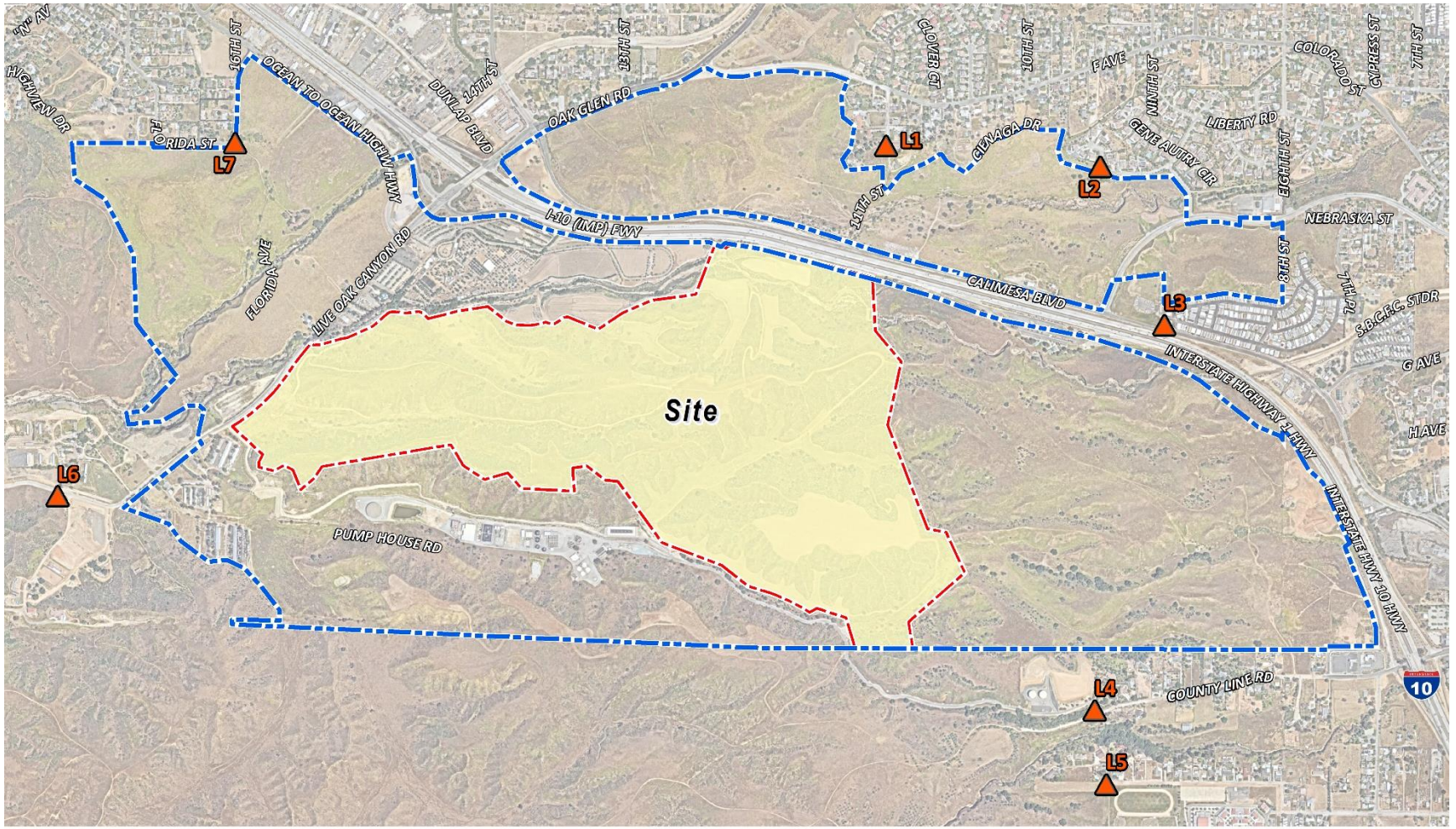
TABLE 5-1: 24-HOUR AMBIENT NOISE LEVEL MEASUREMENTS

Location[1]	Description	Energy Average Noise Level (dBA L_{eq})[2]		CNEL
		Daytime	Nighttime	
L1	Located north of the site near the residence at 13001 11th St.	56.8	57.2	63.7
L2	Located northeast of the site near the residence at 33462 Cienaga Dr.	57.6	61.0	67.4
L3	Located east of the site near the Hillcrest Mobile Estates at 33600 Calimesa Blvd.	79.7	78.7	85.5
L4	Located southeast of the site near the residence at 888 W County Lane Rd.	53.5	52.0	58.7
L5	Located southeast of the site near the residence at 888 W Ave L	52.0	47.6	55.1
L6	Located southwest of the site near the entrance to the residence at 31900 Live Oak Canyon Road.	67.6	64.9	72.0
L7	Located northwest of the site near the residence at 32054 Florida St.	57.3	62.1	68.3

[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_1, L_2, L_5, L_8, L_{25}, L_{50}, L_{90}, L_{95}, and L_{99} percentile noise levels observed during the daytime and nighttime periods.

EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS



N

LEGEND:

FCSP Boundary | POCC Project Boundary | Measurement Locations

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6 TRAFFIC NOISE METHODS AND PROCEDURES

The following section outlines the methods and procedures used to estimate and analyze the future traffic noise environment. Consistent with City of Yucaipa *Noise Compatibility Guidelines* (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 (18) consistent with FCSP DEIR. 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. (19) 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. (20)

6.2 OFF-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

Table 6-1 presents the roadway parameters used to assess the FCSP and POCC Project's off-site transportation noise impacts without and with the Wildwood Canyon Road Interchange. Table 6-1 identifies the 12 off-site study area roadway segments, the distance from the centerline to adjacent land use based on the functional roadway classifications per the City of Yucaipa General Plan Circulation Element, and the vehicle speeds. The ADT volumes used in this study area presented on Table 6-2 are based on the *Freeway Corridor Specific Plan (FCSP) & Pacific Oak Commerce Center (POCC) Traffic Impact Analysis*, prepared by Translutions, Inc. for the following traffic scenarios (21).

1. Existing (E)
2. 2050 without Interchange without FCSP Project
3. 2050 without Interchange with FCSP Project
4. 2050 with Interchange without FCSP Project
5. 2050 with Interchange with FCSP Project
6. Opening Year without Interchange without POCC Project
7. Opening Year without Interchange with POCC Project
8. Opening Year with Interchange without POCC Project
9. Opening Year with Interchange with POCC Project
10. 2050 without Interchange without POCC Project

11. 2050 without Interchange with POCC Project
12. 2050 with Interchange without POCC Project
13. 2050 with Interchange with POCC Project

The ADT volumes vary for each roadway segment based on the existing traffic volumes and the combination of project traffic distributions. This analysis relies on a comparative evaluation of the off-site traffic noise impacts at the boundary of the right-of-way of the receiving adjacent land use, without and with POCC Project ADT traffic volumes from the traffic analysis. The Project is anticipated to generate a net total of 4,355 two-way trips per day (actual vehicles) that includes 1,557 truck trips.

TABLE 6-1: OFF-SITE ROADWAY PARAMETERS

ID	Roadway	Segment	Classification[1]	Receiving Land Use[2]	Distance from Centerline to Receiving Land Use (Feet)[3]	Vehicle Speed (mph)
1	16th St.	s/o Avenue E	Collector	Sensitive	33'	40
2	16th St.	s/o Avenue E	Collector	Sensitive	33'	40
3	Live Oak Cyn. Rd.	s/o Outer Highway 10 S	Secondary	Non-Sensitive	44'	45
4	Live Oak Cyn. Rd.	s/o I-10 WB Ramps	Major	Non-Sensitive	52'	45
5	Live Oak Cyn. Rd.	n/o I-10 WB Ramps	Major	Non-Sensitive	52'	45
6	Oak Glen Rd.	s/o Calimesa Blvd.	Major	Non-Sensitive	52'	45
7	Oak Glen Rd.	n/o Calimesa Blvd.	Major	Sensitive	52'	45
8	Colorado St.	e/o 8th St.	Collector	Sensitive	33'	40
9	Wildwood Cyn. Rd.	n/o Calimesa Blvd.	Secondary	Sensitive	44'	45
10	County Line Rd.	w/o I-10 EB Ramps	Secondary	Sensitive	44'	45
11	County Line Rd.	e/o I-10 WB Ramps	Secondary	Non-Sensitive	44'	45
12	County Line Rd.	e/o Calimesa Blvd.	Secondary	Non-Sensitive	44'	45

[1] Freeway Corridor Specific Plan Update & Pacific Oak Commerce Center Traffic Impact Analysis, Translutions, Inc.
[2] Based on a review of existing aerial imagery.
[3] Distance to receiving land use is based upon the right-of-way distances.

To quantify the off-site noise levels, the 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 6-3 provides the time of day (daytime, evening, and nighttime) vehicle splits. Table 6-4 shows the traffic flow by vehicle type (vehicle mix) used for all without Project traffic scenarios.

TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic Volumes[1]											
			Existing	FCSP 2050		FCSP 2050 Int		POCC OY		POCC OY Int		POCC 2050		POCC 2050 Int	
				Without FCSP Project	With FCSP Project	Without FCSP Project	With FCSP Project	Without POCC Project	With POCC Project	Without POCC Project	With POCC Project	Without POCC Project	With POCC Project	Without POCC Project	With POCC Project
1	16th St.	s/o Avenue E	2,820	4,581	7,471	4,271	6,767	2,955	3,256	2,955	3,045	5,536	5,837	6,066	6,156
2	16th St.	s/o Avenue E	1,255	2,198	3,832	2,062	3,492	1,355	1,692	1,355	1,445	2,817	3,154	3,088	3,178
3	Live Oak Cyn. Rd.	s/o Outer Highway 10 S	6,170	9,334	37,656	7,859	33,263	6,555	8,637	6,020	6,767	20,549	22,630	22,649	23,396
4	Live Oak Cyn. Rd.	s/o I-10 WB Ramps	7,285	11,384	36,706	10,089	32,901	7,945	9,855	7,452	8,029	21,434	23,343	23,079	23,655
5	Live Oak Cyn. Rd.	n/o I-10 WB Ramps	14,220	19,311	41,368	17,992	39,022	15,635	17,131	14,867	15,171	28,257	29,752	29,621	29,925
6	Oak Glen Rd.	s/o Calimesa Blvd.	25,215	31,142	50,232	30,424	58,990	27,540	28,270	25,876	26,061	43,389	44,119	39,772	39,957
7	Oak Glen Rd.	n/o Calimesa Blvd.	16,380	19,456	29,872	18,740	27,542	18,510	18,811	17,613	17,631	22,694	22,995	24,112	24,130
8	Colorado St.	e/o 8th St.	1,790	3,305	3,657	3,614	4,056	1,875	1,909	1,875	1,885	3,814	3,848	3,495	3,505
9	Wildwood Cyn. Rd.	n/o Calimesa Blvd.	6,520	7,653	13,271	11,288	26,328	7,000	7,764	10,037	11,320	18,198	18,962	10,208	11,491
10	County Line Rd.	w/o I-10 EB Ramps	2,755	5,749	18,967	4,791	9,183	2,860	4,862	2,860	3,262	7,566	9,568	12,494	12,896
11	County Line Rd.	e/o I-10 WB Ramps	12,705	18,764	26,250	17,478	19,296	14,950	15,282	14,950	14,950	18,738	19,070	22,644	22,644
12	County Line Rd.	e/o Calimesa Blvd.	9,685	13,157	16,675	13,090	16,042	11,690	11,908	11,690	11,690	14,660	14,878	14,927	14,927

[1] Freeway Corridor Specific Plan Update & Pacific Oak Commerce Center Traffic Impact Analysis, Translutions, 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	70.60%	13.61%	15.79%	100.00%
Medium Trucks	80.34%	4.75%	14.92%	100.00%
Heavy Trucks	75.90%	8.21%	15.90%	100.00%

[1] Based on the 24-hour directional vehicle classification count collected on Cherry Valley Boulevard north of Roberts Road (Oak Valley North Specific Plan, 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	97.53%	1.49%	0.98%	100.00%

[1] Based on the 24-hour directional vehicle classification count collected on Cherry Valley Boulevard north of Roberts Road (Oak Valley North Specific Plan, Urban Crossroads, Inc.)

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 based on *the Freeway Corridor Specific Plan (FCSP) & Pacific Oak Commerce Center (POCC) Traffic Impact Analysis* prepared by Translutions, Inc. (21)

7.1 TRAFFIC NOISE CONTOURS

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

7.2 2050 WITHOUT INTERCHANGE FCSP PROJECT TRAFFIC NOISE LEVEL INCREASES

Table 7-1 presents the 2050 Without Interchange CNEL noise levels. The 2050 Without Interchange Without FCSP Project exterior noise levels range from 62.6 to 73.0 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. The 2050 Without Interchange with FCSP Project conditions will range from 64.8 to 75.1 dBA CNEL. Table 7-1 shows that the FCSP Project off-site traffic noise level increases range from 0.5 to 6.1 dBA CNEL. This incremental noise level increase would exceed the applicable significance thresholds under the with FCSP Project scenario for the following five study area roadway segments:

- 16th Street south of Avenue E (Segment #1)
- Live Oak Canyon Road north of I-10 Westbound Ramps (Segment #5)
- Oak Glen Road north of Calimesa Boulevard (Segment #7)
- Wildwood Canyon Road north of Calimesa Boulevard (Segment #9)
- County Line Road w/o I-10 EB Ramps (Segment #10)

Therefore, the FCSP Project's contribution to the 2050 off-site traffic noise levels would result in a *potentially significant* off-site traffic noise impact. This is consistent with the significant findings outlined in the FCSP DEIR.

TABLE 7-1: 2050 WITHOUT INTERCHANGE FCSP PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[1]			Incremental Noise Level Increase Threshold[2]	
				No FCSP Project	With FCSP Project	FCSP Project Addition	Limit	Exceeded?
1	16th St.	s/o Avenue E	Sensitive	65.8	67.9	2.1	1.5	**Yes**
2	16th St.	s/o Avenue E	Sensitive	62.6	65.0	2.4	3.0	No
3	Live Oak Cyn. Rd.	s/o Outer Highway 10 S	Non-Sensitive	68.7	74.8	6.1	n/a	No
4	Live Oak Cyn. Rd.	s/o I-10 WB Ramps	Non-Sensitive	68.7	73.8	5.1	n/a	No
5	Live Oak Cyn. Rd.	n/o I-10 WB Ramps	Non-Sensitive	71.0	74.3	3.3	3.0	**Yes**
6	Oak Glen Rd.	s/o Calimesa Blvd.	Non-Sensitive	73.0	75.1	2.1	3.0	No
7	Oak Glen Rd.	n/o Calimesa Blvd.	Sensitive	71.0	72.9	1.9	1.5	**Yes**
8	Colorado St.	e/o 8th St.	Sensitive	64.3	64.8	0.5	3.0	No
9	Wildwood Cyn. Rd.	n/o Calimesa Blvd.	Sensitive	67.8	70.2	2.4	1.5	**Yes**
10	County Line Rd.	w/o I-10 EB Ramps	Sensitive	66.6	71.8	5.2	1.5	**Yes**
11	County Line Rd.	e/o I-10 WB Ramps	Non-Sensitive	71.7	73.2	1.5	3.0	No
12	County Line Rd.	e/o Calimesa Blvd.	Non-Sensitive	70.2	71.2	1.0	3.0	No

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the receiving land use.
[3] Does the FCSP Project create an incremental noise level increase exceeding the significance criteria (Table 4-1)?
"n/a" Per the OPR land use/noise compatibility standards, 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: 2050 WITH INTERCHANGE FCSP PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[1]			Incremental Noise Level Increase Threshold[2]	
				No FCSP Project	With FCSP Project	FCSP Project Addition	Limit	Exceeded?
1	16th St.	s/o Avenue E	Sensitive	65.4	67.4	2.0	1.5	**Yes**
2	16th St.	s/o Avenue E	Sensitive	62.3	64.6	2.3	3.0	No
3	Live Oak Cyn. Rd.	s/o Outer Highway 10 S	Non-Sensitive	68.0	74.2	6.2	n/a	No
4	Live Oak Cyn. Rd.	s/o I-10 WB Ramps	Non-Sensitive	68.2	73.3	5.1	n/a	No
5	Live Oak Cyn. Rd.	n/o I-10 WB Ramps	Non-Sensitive	70.7	74.0	3.3	3.0	**Yes**
6	Oak Glen Rd.	s/o Calimesa Blvd.	Non-Sensitive	72.9	75.8	2.9	3.0	No
7	Oak Glen Rd.	n/o Calimesa Blvd.	Sensitive	70.8	72.5	1.7	1.5	**Yes**
8	Colorado St.	e/o 8th St.	Sensitive	64.7	65.2	0.5	3.0	No
9	Wildwood Cyn. Rd.	n/o Calimesa Blvd.	Sensitive	69.5	73.2	3.7	1.5	**Yes**
10	County Line Rd.	w/o I-10 EB Ramps	Sensitive	65.8	68.6	2.8	1.5	**Yes**
11	County Line Rd.	e/o I-10 WB Ramps	Non-Sensitive	71.4	71.9	0.5	3.0	No
12	County Line Rd.	e/o Calimesa Blvd.	Non-Sensitive	70.2	71.1	0.9	3.0	No

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

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

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

"n/a" Per the OPR land use/noise compatibility standards, 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: OY WITHOUT INTERCHANGE POCC PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[1]			Incremental Noise Level Increase Threshold[2]	
				No POCC Project	With POCC Project	POCC Project Addition	Limit	Exceeded?
1	16th St.	s/o Avenue E	Sensitive	63.8	64.1	0.3	3.0	No
2	16th St.	s/o Avenue E	Sensitive	60.5	61.1	0.6	3.0	No
3	Live Oak Cyn. Rd.	s/o Outer Highway 10 S	Non-Sensitive	67.2	72.9	5.7	n/a	No
4	Live Oak Cyn. Rd.	s/o I-10 WB Ramps	Non-Sensitive	67.1	72.2	5.1	n/a	No
5	Live Oak Cyn. Rd.	n/o I-10 WB Ramps	Non-Sensitive	70.1	72.1	2.0	3.0	No
6	Oak Glen Rd.	s/o Calimesa Blvd.	Non-Sensitive	72.5	73.7	1.2	3.0	No
7	Oak Glen Rd.	n/o Calimesa Blvd.	Sensitive	70.8	70.8	0.0	1.5	No
8	Colorado St.	e/o 8th St.	Sensitive	61.9	61.9	0.0	3.0	No
9	Wildwood Cyn. Rd.	n/o Calimesa Blvd.	Sensitive	67.5	72.5	5.0	1.5	**Yes**
10	County Line Rd.	w/o I-10 EB Ramps	Sensitive	63.6	72.1	8.5	3.0	**Yes**
11	County Line Rd.	e/o I-10 WB Ramps	Non-Sensitive	70.8	70.8	0.0	3.0	No
12	County Line Rd.	e/o Calimesa Blvd.	Non-Sensitive	69.7	69.7	0.0	n/a	No

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

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

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

"n/a" Per the OPR land use/noise compatibility standards, 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: OY WITH INTERCHANGE POCC PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[1]			Incremental Noise Level Increase Threshold[2]	
				No POCC Project	With POCC Project	POCC Project Addition	Limit	Exceeded?
1	16th St.	s/o Avenue E	Sensitive	63.8	63.9	0.1	3.0	No
2	16th St.	s/o Avenue E	Sensitive	60.5	60.6	0.1	3.0	No
3	Live Oak Cyn. Rd.	s/o Outer Highway 10 S	Non-Sensitive	66.8	70.1	3.3	n/a	No
4	Live Oak Cyn. Rd.	s/o I-10 WB Ramps	Non-Sensitive	66.8	69.6	2.8	n/a	No
5	Live Oak Cyn. Rd.	n/o I-10 WB Ramps	Non-Sensitive	69.8	70.7	0.9	n/a	No
6	Oak Glen Rd.	s/o Calimesa Blvd.	Non-Sensitive	72.2	72.3	0.1	3.0	No
7	Oak Glen Rd.	n/o Calimesa Blvd.	Sensitive	70.6	70.6	0.0	1.5	No
8	Colorado St.	e/o 8th St.	Sensitive	61.9	61.9	0.0	3.0	No
9	Wildwood Cyn. Rd.	n/o Calimesa Blvd.	Sensitive	69.0	69.4	0.4	1.5	No
10	County Line Rd.	w/o I-10 EB Ramps	Sensitive	63.6	64.0	0.4	3.0	No
11	County Line Rd.	e/o I-10 WB Ramps	Non-Sensitive	70.8	70.8	0.0	3.0	No
12	County Line Rd.	e/o Calimesa Blvd.	Non-Sensitive	69.7	69.7	0.0	n/a	No

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

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

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

"n/a" Per the OPR land use/noise compatibility standards, 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: 2050 WITHOUT INTERCHANGE POCC PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[1]			Incremental Noise Level Increase Threshold[2]	
				No POCC Project	With POCC Project	POCC Project Addition	Limit	Exceeded?
1	16th St.	s/o Avenue E	Sensitive	66.6	66.7	0.1	1.5	No
2	16th St.	s/o Avenue E	Sensitive	63.6	64.0	0.4	3.0	No
3	Live Oak Cyn. Rd.	s/o Outer Highway 10 S	Non-Sensitive	72.1	74.8	2.7	3.0	No
4	Live Oak Cyn. Rd.	s/o I-10 WB Ramps	Non-Sensitive	71.4	74.0	2.6	3.0	No
5	Live Oak Cyn. Rd.	n/o I-10 WB Ramps	Non-Sensitive	72.6	73.9	1.3	3.0	No
6	Oak Glen Rd.	s/o Calimesa Blvd.	Non-Sensitive	74.5	75.3	0.8	3.0	No
7	Oak Glen Rd.	n/o Calimesa Blvd.	Sensitive	71.7	71.7	0.0	1.5	No
8	Colorado St.	e/o 8th St.	Sensitive	65.0	65.0	0.0	1.5	No
9	Wildwood Cyn. Rd.	n/o Calimesa Blvd.	Sensitive	71.6	74.3	2.7	1.5	**Yes**
10	County Line Rd.	w/o I-10 EB Ramps	Sensitive	67.8	73.0	5.2	1.5	**Yes**
11	County Line Rd.	e/o I-10 WB Ramps	Non-Sensitive	71.7	71.8	0.1	3.0	No
12	County Line Rd.	e/o Calimesa Blvd.	Non-Sensitive	70.7	70.7	0.0	3.0	No

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

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

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

"n/a" Per the OPR land use/noise compatibility standards, 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: 2050 WITH INTERCHANGE POCC PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[1]			Incremental Noise Level Increase Threshold[2]	
				No POCC Project	With POCC Project	POCC Project Addition	Limit	Exceeded?
1	16th St.	s/o Avenue E	Sensitive	67.0	67.0	0.0	1.5	No
2	16th St.	s/o Avenue E	Sensitive	64.0	64.1	0.1	3.0	No
3	Live Oak Cyn. Rd.	s/o Outer Highway 10 S	Non-Sensitive	72.6	73.7	1.1	3.0	No
4	Live Oak Cyn. Rd.	s/o I-10 WB Ramps	Non-Sensitive	71.7	72.9	1.2	3.0	No
5	Live Oak Cyn. Rd.	n/o I-10 WB Ramps	Non-Sensitive	72.8	73.3	0.5	3.0	No
6	Oak Glen Rd.	s/o Calimesa Blvd.	Non-Sensitive	74.1	74.1	0.0	3.0	No
7	Oak Glen Rd.	n/o Calimesa Blvd.	Sensitive	71.9	71.9	0.0	1.5	No
8	Colorado St.	e/o 8th St.	Sensitive	64.6	64.6	0.0	3.0	No
9	Wildwood Cyn. Rd.	n/o Calimesa Blvd.	Sensitive	69.1	69.4	0.3	1.5	No
10	County Line Rd.	w/o I-10 EB Ramps	Sensitive	70.0	70.1	0.1	1.5	No
11	County Line Rd.	e/o I-10 WB Ramps	Non-Sensitive	72.6	72.6	0.0	3.0	No
12	County Line Rd.	e/o Calimesa Blvd.	Non-Sensitive	70.8	70.8	0.0	3.0	No

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

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

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

"n/a" Per the OPR land use/noise compatibility standards, 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 2050 WITH INTERCHANGE FCSP PROJECT TRAFFIC NOISE LEVEL INCREASES

Table 7-2 presents the 2050 With Interchange CNEL noise levels. The 2050 With Interchange Without FCSP Project exterior noise levels range from 62.3 to 72.9 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. The 2050 With Interchange with FCSP Project conditions will range from 64.6 to 75.8 dBA CNEL. Table 7-2 shows that the FCSP Project off-site traffic noise level increases range from 0.5 to 6.2 dBA CNEL. This incremental noise level increase would exceed the applicable significance thresholds under the with FCSP Project scenario for the following five study area roadway segments:

- 16th Street south of Avenue E (Segment #1)
- Live Oak Canyon Road north of I-10 Westbound Ramps (Segment #5)
- Oak Glen Road north of Calimesa Boulevard (Segment #7)
- Wildwood Canyon Road north of Calimesa Boulevard (Segment #9)
- County Line Road west of I-10 Eastbound Ramps (Segment #10)

Therefore, the FCSP Project's contribution to the 2050 with interchange off-site traffic noise levels would result in a *potentially significant* off-site traffic noise impact. This is consistent with the significant findings outlined in the FCSP DEIR.

7.4 OY WITHOUT INTERCHANGE POCC PROJECT TRAFFIC NOISE LEVEL INCREASES

Table 7-3 presents the Opening Year Without Interchange (OY) POCC Project conditions CNEL noise levels. The OY Without Interchange Without POCC Project exterior noise levels range from 60.5 to 72.5 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. The OY Without Interchange With POCC Project conditions will range from 61.1 to 73.7 dBA CNEL. Table 7-10 shows that the POCC Project off-site traffic noise level increases range from 0.0 to 8.5 dBA CNEL. This incremental noise level increase would exceed the applicable significance thresholds under the with POCC Project scenario for the following two study area roadway segments:

- Wildwood Canyon Road north of Calimesa Boulevard (Segment #9)
- County Line Road west of I-10 Freeway Eastbound Ramps (Segment #10)

Therefore, the POCC Project's contribution to off-site traffic noise would result in a *potentially significant* off-site traffic noise impact. This is consistent with the significant findings outlined in the FCSP DEIR.

7.5 OY WITH INTERCHANGE POCC PROJECT TRAFFIC NOISE LEVEL INCREASES

Table 7-4 presents the Opening Year With Interchange (OY Int) POCC Project conditions CNEL noise levels. The Opening Year With Interchange without POCC Project exterior noise levels range from 60.5 to 72.2 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. The Opening Year With Interchange with POCC Project conditions will range from 60.6 to 72.3 dBA CNEL. Table 7-4 shows that the POCC Project off-site traffic noise level increases range from 0.0 to 3.3 dBA CNEL. Based on the significance criteria for off-site traffic noise presented in Table 4-1, land uses adjacent to all the study area roadway

segments would experience *less than significant* Opening Year With Interchange noise level increases on receiving land uses due to the POCC Project.

7.6 2050 WITHOUT INTERCHANGE POCC PROJECT TRAFFIC NOISE LEVEL INCREASES

Table 7-5 presents the 2050 Without Interchange POCC Project conditions CNEL noise levels. The 2050 Without Interchange Without POCC Project exterior noise levels range from 63.6 to 74.5 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. The 2050 Without Interchange With POCC Project conditions will range from 64.0 to 75.3 dBA CNEL. Table 7-5 shows that the POCC Project off-site traffic noise level increases range from 0.0 to 5.2 dBA CNEL. This incremental noise level increase would exceed the applicable significance thresholds under the with POCC Project scenario for the following two study area roadway segments:

- Wildwood Canyon Road north of Calimesa Boulevard (Segment #9)
- County Line Road west of I-10 Freeway Eastbound Ramps (Segment #10)

Therefore, the POCC Project's contribution to off-site traffic noise would result in a *potentially significant* off-site traffic noise impact. This is consistent with the significant findings outlined in the FCSP DEIR.

7.7 2050 WITH INTERCHANGE POCC PROJECT TRAFFIC NOISE LEVEL INCREASES

Table 7-6 presents the 2050 Interchange POCC Project conditions CNEL noise levels. The 2050 With Interchange without POCC Project exterior noise levels range from 64.0 to 74.1 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. The 2050 With Interchange with POCC Project conditions will range from 64.1 to 74.1 dBA CNEL. Table 7-6 shows that the POCC Project off-site traffic noise level increases range from 0.0 to 1.2 dBA CNEL. Based on the significance criteria for off-site traffic noise presented in Table 4-1, land uses adjacent to all the study area roadway segments would experience *less than significant* 2050 With Interchange noise level increases on receiving land uses due to the POCC Project.

7.8 OFF-SITE TRAFFIC NOISE MITIGATION

The off-site Traffic Noise Analysis shows that the Project traffic noise level increases on study area roadway segments will exceed the incremental noise level increase thresholds shown on Table 4-1 and represents a *potentially significant* impact consistent with the findings outlined in the FCSP DEIR. The FCSP DEIR determined that it is not considered practical or feasible to mitigate these impacts, as it would require making alterations to private off-site properties over which applicants of future development projects would have no control. 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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8 SENSITIVE RECEIVER LOCATIONS

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

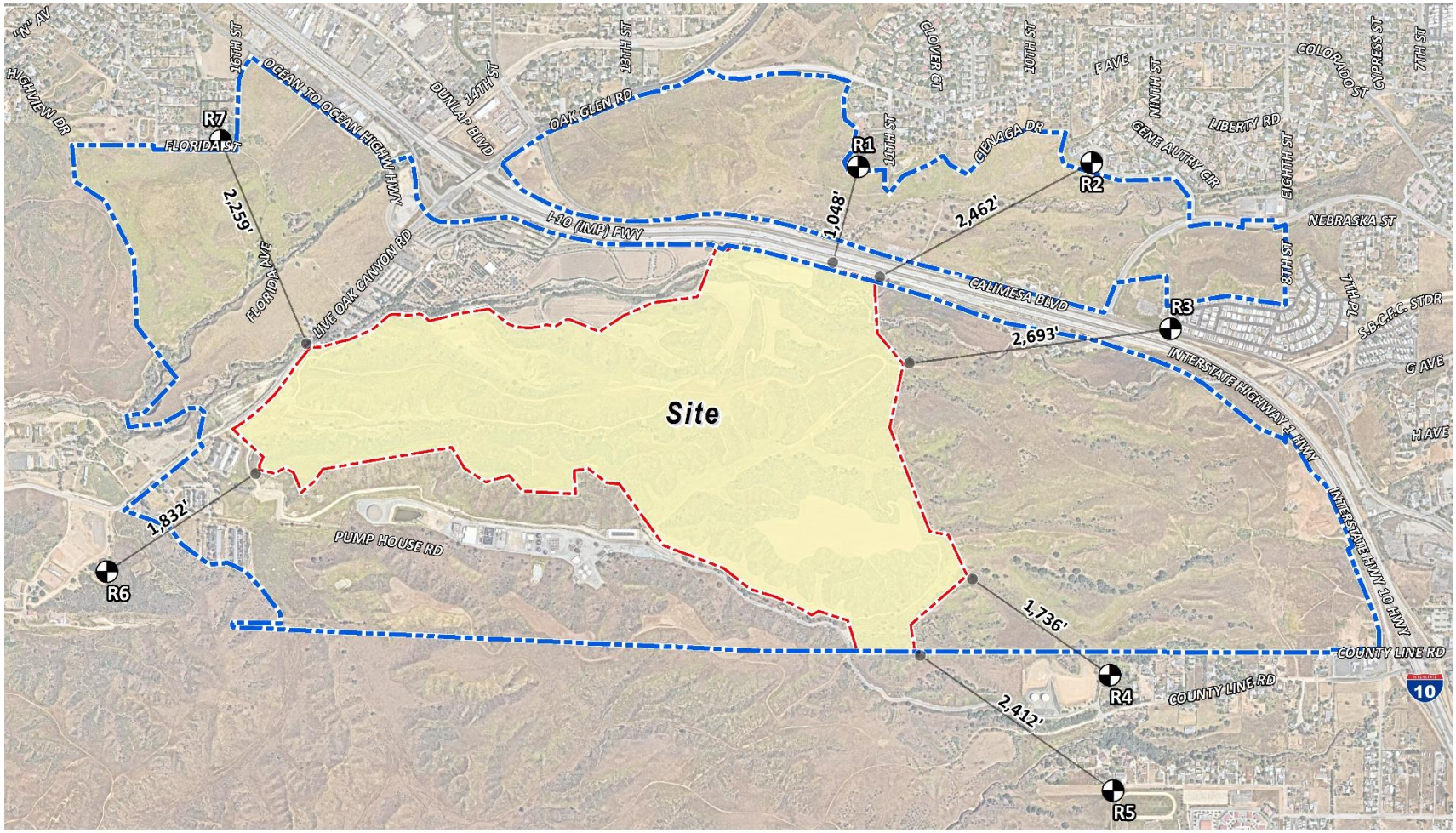
The Environmental Noise Study for the FCSP found that implementation of the approved FCSP would result in the introduction of new noise sources that may potentially impact existing off-site noise-sensitive properties near commercial and business park land uses. (3 p. 22) This includes potential operational noise source level impacts to the existing residential areas surrounding the approved FCSP. Existing neighborhoods potentially impacted include the single-family residential communities located north of the site near Florida Street, north of Oak Glenn Road and those near Colorado Street.

To describe the potential off-site POCC Project noise levels, seven receiver locations in the vicinity of the POCC Project site were identified. 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 POCC Project study area that are located at greater distances than those identified in this noise study will experience lower noise levels than those presented in this report due to the additional attenuation from distance and the shielding of intervening structures. Distance is measured in a straight line from the POCC Project boundary to each receiver location.

R1: Location R1 represents the existing noise sensitive residence at 13000 11th Street, approximately 1,048 feet north of the POCC Project site. R1 is placed in the private outdoor living areas (backyard) facing the POCC Project site. A 24-hour noise measurement was taken near this location, L1, to describe the existing ambient noise environment.

R2: Location R2 represents the existing noise sensitive residence at 33425 James Stewart Court, approximately 2,462 feet northeast of the POCC Project site. R2 is placed in the private outdoor living areas (backyard) facing the POCC Project site. A 24-hour noise measurement was taken near this location, L2, to describe the existing ambient noise environment.

EXHIBIT 8-A: RECEIVER LOCATIONS



R3: Location R3 represents the existing noise sensitive residences within the Hillcrest Mobile Estates at 33600 Calimesa Boulevard, approximately 2,693 feet east of the POCC Project site. Since there are no private outdoor living areas (backyards) facing the POCC Project site, receiver R3 is placed at the nearest residential building façade. A 24-hour noise measurement was taken near this location, L3, to describe the existing ambient noise environment.

R4: Location R4 represents the existing noise sensitive residence at 888 W County Line Road, approximately 1,736 feet southeast of the POCC Project site. R4 is placed in the private outdoor living areas (backyard) facing the POCC Project site. A 24-hour noise measurement was taken near this location, L4, to describe the existing ambient noise environment.

R5: Location R5 represents the Mesa View Middle School at 800 Mustang Way S Monterey Avenue, approximately 2,412 feet southeast of the POCC Project site. R5 is situated in the northwest corner of the athletic field facing the POCC 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 noise sensitive residence at 32029 Live Oak Canyon Road, approximately 1,832 feet southwest of the POCC Project site. R6 is placed in the private outdoor living areas (backyard) facing the POCC 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 noise sensitive residence at 32080 Florida Street, approximately 2,259 feet northwest of the POCC Project site. R7 is placed in the private outdoor living areas (backyard) facing the POCC Project site. A 24-hour noise measurement was taken near this location, L7, to describe the existing ambient noise environment.

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9 OPERATIONAL NOISE IMPACTS

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

9.1 FCSP OPERATIONAL NOISE LEVELS

The DEIR determined that implementation of the FCSP may result in exposure of persons to noise levels in excess of standards established in the City of Yucaipa's Municipal Code and Development Code. This includes *potentially significant* operational noise source level impacts from truck deliveries, load dock activities, parking lot activities, and mechanical equipment to the existing off-site noise-sensitive properties surrounding the approved FCSP. According to the Environmental Noise Study for the FCSP, compliance with the City's typical Conditions of Approval is sufficient to mitigate all significant impacts. (3 p. 22)

9.2 POCC PROJECT 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 POCC Project site. This includes a combination of noise sources such as cold storage loading dock activity, tractor trailer parking activity, roof-top air conditioning units, trash enclosure activity, parking lot vehicle movements, and truck movements. The POCC operational noise sources shown on Exhibit 9-A includes over 39 individual noise sources to conservatively describe the potential worst-case noise environment. Consistent with similar warehouse uses, the POCC Project business operations would primarily be conducted within the enclosed building, except for traffic movement, parking, as well as loading and unloading of trucks at designated loading bays.

9.3 REFERENCE NOISE LEVELS

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

EXHIBIT 9-A: POCC PROJECT OPERATIONAL NOISE SOURCE LOCATIONS

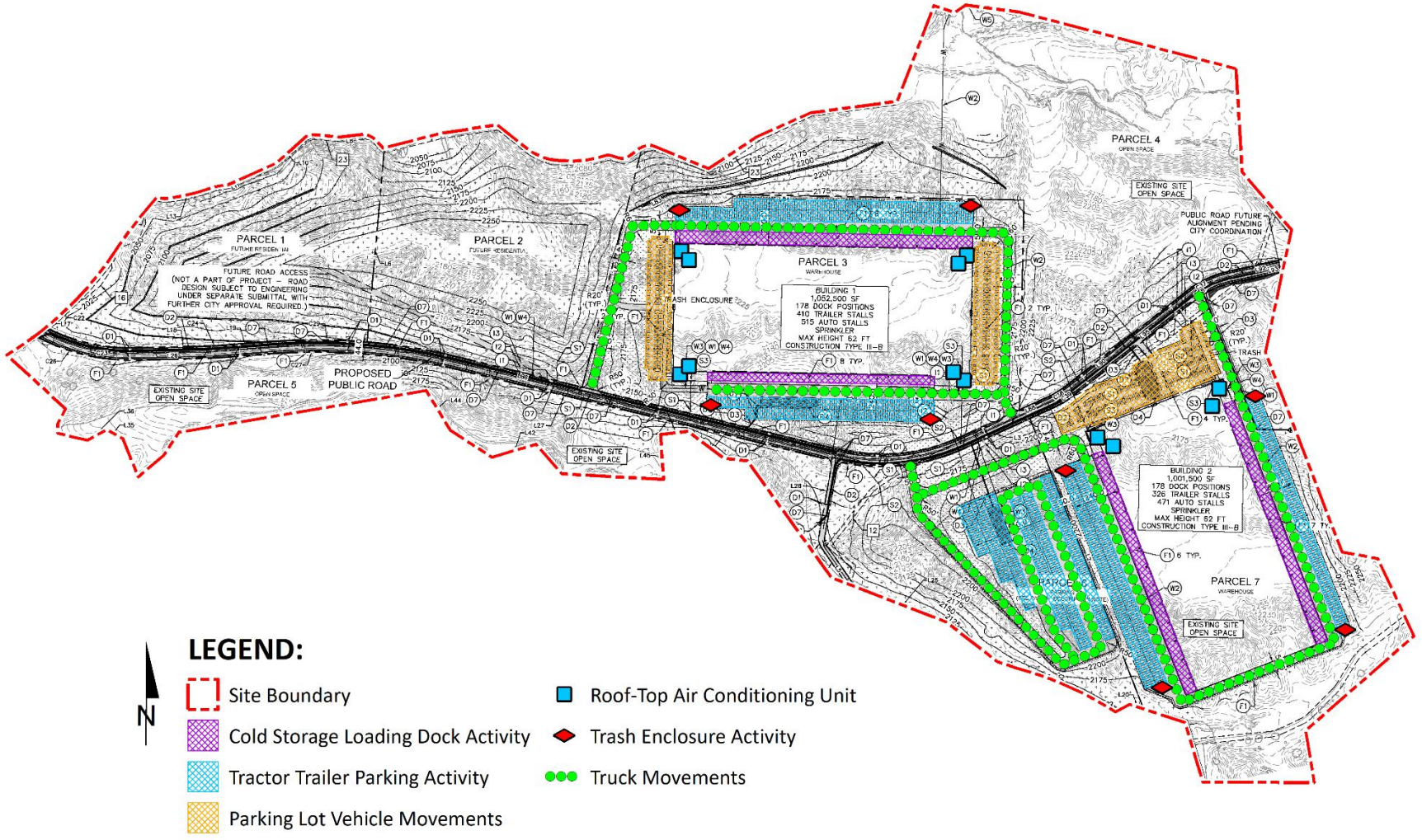


TABLE 9-1: REFERENCE NOISE LEVEL MEASUREMENTS

Reference Noise Source	Noise Source Height (Feet)	Min./ Hour[1]		Reference Noise Level (dBA L_{eq}) @ 50 Feet	Sound Power Level (dBA)[2]
		Day	Night		
Cold Storage Loading Dock Activity	8'	60	60	65.7	111.5
Tractor Trailer Parking Activity	8'	60	60	62.8	103.4
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

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

9.3.1 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. (17)

9.3.2 COLD STORAGE LOADING DOCK ACTIVITY

The reference cold storage loading dock activities are intended to describe the typical outdoor operational noise activities associated with the POCC 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, this reference noise level conservatively assumes that all loading dock activity is associated with cold storage facilities, even though only 25 percent cold storage is anticipated. (21) 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.

9.3.3 TRACTOR TRAILER PARKING ACTIVITY

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

9.3.4 ROOF-TOP AIR CONDITIONING UNITS

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

9.3.5 TRASH ENCLOSURE ACTIVITY

To describe the noise levels associated with a trash enclosure activity, Urban Crossroads collected a reference noise level measurement at an existing trash enclosure containing two dumpster bins. The trash enclosure noise levels describe metal gates opening and closing, metal scraping against concrete floor sounds, dumpster movement on metal wheels, and trash dropping into the metal dumpster. The reference noise levels describe trash enclosure noise activities when trash is dropped into an empty metal dumpster, as would occur at the POCC 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 POCC Project's proposed building.

9.3.6 PARKING LOT VEHICLE MOVEMENTS

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

9.3.7 TRUCK MOVEMENTS

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

9.4 CADNAA NOISE PREDICTION MODEL

To fully describe the exterior operational noise levels from the POCC 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 POCC 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 POCC Project operational noise levels presented in this section.

9.5 POCC PROJECT OPERATIONAL NOISE LEVELS

Using the reference noise levels to represent the proposed POCC Project operations that include cold storage loading dock activity, tractor trailer parking activity, roof-top air conditioning units, trash enclosure activity, parking lot vehicle movements, and truck movements, Urban Crossroads, Inc. calculated the operational source noise levels that are expected to be generated at the POCC Project site and the POCC Project-related noise level increases that would be experienced at each of the sensitive receiver locations. Table 9-2 shows the POCC Project operational noise levels during the daytime hours of 7:00 a.m. to 10:00 p.m. The daytime hourly noise levels at the off-site receiver locations are expected to range from 34.6 to 43.5 dBA L_{eq}.

TABLE 9-2: DAYTIME POCC PROJECT OPERATIONAL NOISE LEVELS

Noise Source[1]	Operational Noise Levels by Receiver Location (dBA Leq)						
	R1	R2	R3	R4	R5	R6	R7
Cold Storage Loading Dock Activity	42.1	38.5	39.7	41.2	38.6	32.9	34.2
Tractor Trailer Parking Activity	37.1	32.6	33.6	35.1	33.9	28.8	28.3
Roof-Top Air Conditioning Units	23.8	20.3	20.6	18.7	16.8	16.3	17.1
Trash Enclosure Activity	23.4	19.5	20.4	22.9	20.5	14.3	14.8
Parking Lot Vehicle Movements	11.4	7.2	7.4	0.9	0.0	1.9	3.4
Truck Movements	25.6	21.1	21.4	22.1	20.5	19.5	19.8
Total (All Noise Sources)	**43.5**	**39.7**	**40.8**	**42.3**	**40.0**	**34.6**	**35.4**

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

Table 9-3 shows the unmitigated POCC 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 35.9 to 43.4 dBA L_{eq}. The differences between the daytime and nighttime noise levels are largely related to the estimated duration of noise activity as outlined in Table 9-1 and Appendix 9.1.

TABLE 9-3: NIGHTTIME POCC PROJECT OPERATIONAL NOISE LEVELS

Noise Source[1]	Operational Noise Levels by Receiver Location (dBA Leq)						
	R1	R2	R3	R4	R5	R6	R7
Cold Storage Loading Dock Activity	42.1	38.5	39.7	41.2	38.6	34.6	34.7
Tractor Trailer Parking Activity	37.1	32.6	33.6	35.1	33.9	30.4	28.8
Roof-Top Air Conditioning Units	21.4	17.9	18.2	16.3	14.7	14.7	15.3
Trash Enclosure Activity	19.4	15.5	16.4	18.9	16.6	11.9	11.5
Parking Lot Vehicle Movements	11.4	7.2	7.4	0.9	0.0	3.1	3.8
Truck Movements	25.6	21.1	21.4	22.1	20.6	20.0	20.0
Total (All Noise Sources)	**43.4**	**39.6**	**40.7**	**42.2**	**40.0**	**36.2**	**35.9**

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

9.6 POCC PROJECT OPERATIONAL NOISE LEVEL COMPLIANCE

To demonstrate compliance with local noise regulations, the POCC Project-only operational noise levels are evaluated against exterior noise level thresholds based on the City of Yucaipa exterior noise level standards at nearby noise-sensitive receiver locations. Table 9-4 shows the unmitigated operational noise levels associated with the POCC Project will not exceed the City of Yucaipa daytime and nighttime exterior noise level standards. Therefore, the operational noise impacts are considered *less than significant*.

TABLE 9-4: POCC PROJECT OPERATIONAL NOISE LEVEL COMPLIANCE

Receiver Location[1]	POCC 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	43.5	43.4	55	55	No	No
R2	39.7	39.6	55	55	No	No
R3	40.8	40.7	55	55	No	No
R4	42.3	42.2	55	55	No	No
R5	40.0	40.0	55	55	No	No
R6	34.6	36.2	55	55	No	No
R7	35.4	35.9	55	55	No	No

[1] See Exhibit 8-A for the receiver locations.
[2] Proposed POCC Project unmitigated 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 POCC Project operational noise source activities exceed the noise level standards?
[5] "Daytime" = 7:00 a.m. - 10:00 p.m.; "Nighttime" = 10:00 p.m. - 7:00 a.m.

9.7 POCC PROJECT OPERATIONAL NOISE LEVEL INCREASES

To describe the POCC Project operational noise level increases, the POCC Project operational noise levels are combined with the existing ambient noise levels measurements for the nearby receiver locations potentially impacted by POCC Project operational noise sources. Since the units used to measure noise, decibels (dB), are logarithmic units, the POCC Project-operational and existing ambient noise levels cannot be combined using standard arithmetic equations. (4) Instead, they must be logarithmically added using the following base equation:

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

Where "SPL1," "SPL2," etc. are equal to the sound pressure levels being combined, or in this case, the POCC Project-operational and existing ambient noise levels. The difference between the combined POCC Project and ambient noise levels describes the POCC Project noise level increases to the existing ambient noise environment. Noise levels that would be experienced at receiver locations when POCC 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 POCC Project will generate a daytime operational noise level increase ranging from 0.0 to 0.3 dBA L_{eq} at the nearest receiver locations. Table 9-6 shows that the POCC Project will generate a nighttime operational noise level increase ranging from 0.0 to 0.7 dBA L_{eq} at the nearest receiver locations. POCC 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 POCC PROJECT OPERATIONAL NOISE LEVEL INCREASES

Receiver Location[1]	Total POCC Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined POCC Project and Ambient[5]	POCC Project Increase[6]	Increase Criteria[7]	Increase Criteria Exceeded?
R1	43.5	L1	56.8	57.0	0.2	5.0	No
R2	39.7	L2	57.6	57.7	0.1	5.0	No
R3	40.8	L3	79.7	79.7	0.0	1.5	No
R4	42.3	L4	53.5	53.8	0.3	5.0	No
R5	40.0	L5	52.0	52.3	0.3	5.0	No
R6	34.6	L6	67.6	67.6	0.0	1.5	No
R7	35.4	L7	57.3	57.3	0.0	5.0	No

[1] See Exhibit 8-A for the receiver locations.
[2] Total POCC 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 POCC Project activities.
[6] The noise level increase expected with the addition of the proposed POCC Project activities.
[7] Significance increase criteria as shown on Table 4-1.

TABLE 9-6: NIGHTTIME POCC PROJECT OPERATIONAL NOISE LEVEL INCREASES

Receiver Location[1]	Total POCC Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined POCC Project and Ambient[5]	POCC Project Increase[6]	Increase Criteria[7]	Increase Criteria Exceeded?
R1	43.4	L1	57.2	57.4	0.2	5.0	No
R2	39.6	L2	61.0	61.0	0.0	5.0	No
R3	40.7	L3	78.7	78.7	0.0	1.5	No
R4	42.2	L4	52.0	52.4	0.4	5.0	No
R5	40.0	L5	47.6	48.3	0.7	5.0	No
R6	36.2	L6	64.9	64.9	0.0	5.0	No
R7	35.9	L7	62.1	62.1	0.0	5.0	No

[1] See Exhibit 8-A for the receiver locations.
[2] Total POCC 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 POCC Project activities.
[6] The noise level increase expected with the addition of the proposed POCC Project activities.
[7] Significance increase criteria as shown on Table 4-1.

10 CONSTRUCTION IMPACTS

This section analyzes potential impacts resulting from the short-term construction activities associated with the development of the Freeway Corridor Specific Plan (FCSP) & Pacific Oak Commerce Center (POCC).

10.1 FCSP CONSTRUCTION NOISE LEVELS

The DEIR determined that construction of future development projects may produce a substantial temporary or periodic increase in ambient noise levels in the vicinity above levels existing without the FCSP. However, the FCSP DEIR determined that the construction activities that comply with the time and day restrictions provided in the City of Yucaipa Municipal Code are not required to comply with any noise limitations. Therefore, the DEIR found that the impact of FCSP construction noise would be *less than significant*.

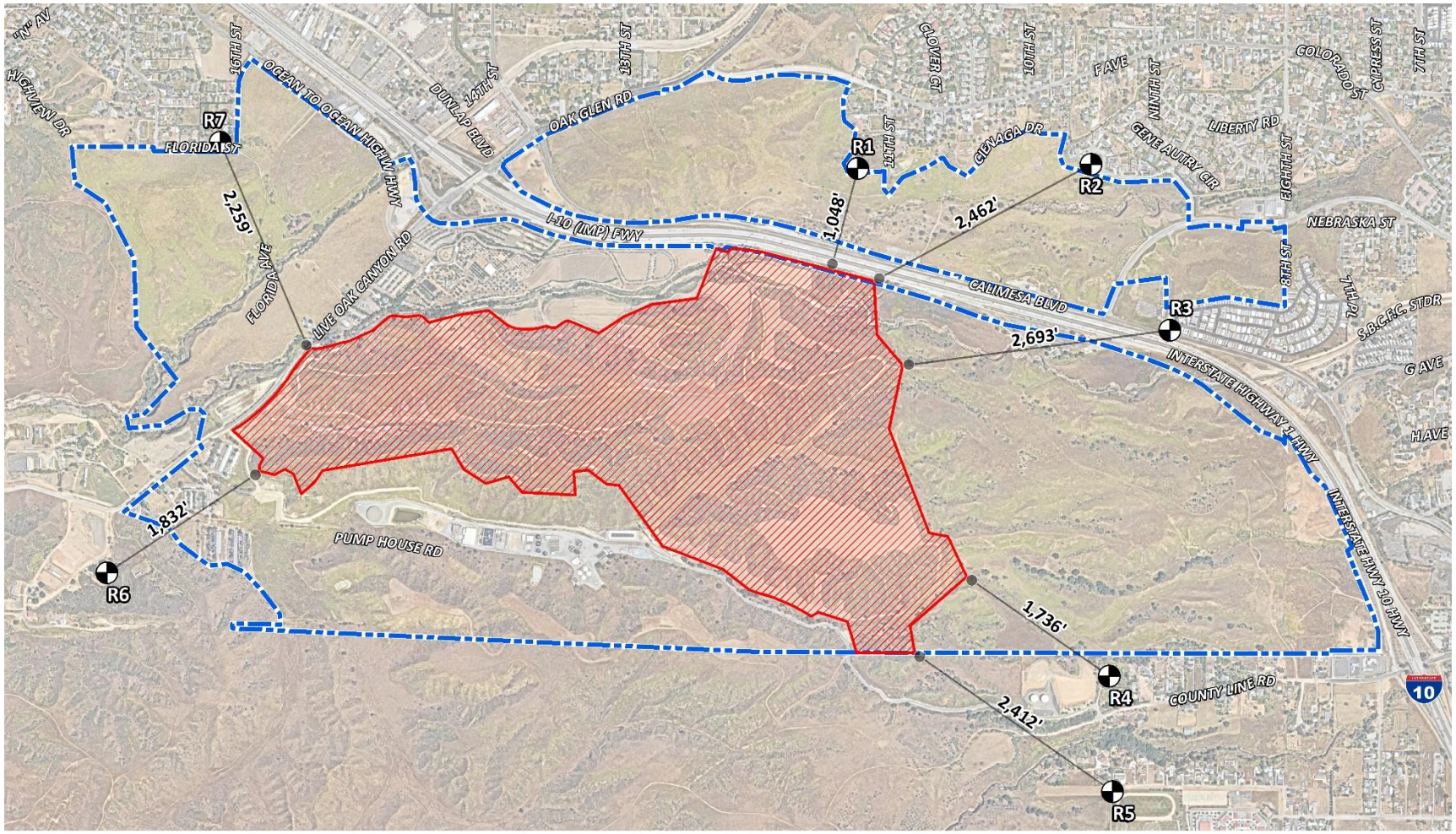
10.2 POCC PROJECT CONSTRUCTION NOISE SOURCES

This section analyzes the potential construction noise impacts at the nearest receiver locations, identified in Section 8, resulting from the construction of the proposed POCC Project. Exhibit 10-A presents the on-site construction noise source activity in relation to the nearest sensitive receiver locations. According to Chapter 87.0905[e][1][c] of the City's Municipal Code exempts: *Temporary Construction, repair, or demolition activities between 7 a.m. and 7 p.m., except Sundays and Federal holidays.* (12) POCC Project construction noise levels are, therefore, considered exempt from municipal regulation if activities occur within the hours specified in the City of Yucaipa Municipal Code, Chapter 87.0905 of 7:00 a.m. to 7:00 p.m., except Sundays and Federal holidays. However, neither the City of Yucaipa 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).

10.3 POCC 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 POCC Project construction activities are expected to occur in the following stages, site preparation, grading, building construction, paving and architectural coating.

EXHIBIT 10-A: CONSTRUCTION NOISE SOURCE LOCATIONS



10.4 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. (22) 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.

10.5 CONSTRUCTION NOISE ANALYSIS

Using the reference construction equipment noise levels and the CadnaA noise prediction model, calculations of the POCC Project construction noise level impacts at the nearby sensitive receiver locations were completed. Consistent with FTA guidance for detailed construction noise assessment, Table 10-1 presents the combined noise levels for the loudest construction equipment, assuming they operate at the same time. As shown on Table 10-2, the construction noise levels are expected to range from 48.8 to 55.5 dBA L_{eq} at the nearby receiver locations. Appendix 10.1 includes the detailed CadnaA construction noise model calculations.

TABLE 10-1: PCONSTRUCTION REFERENCE NOISE LEVELS

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

[1] FHWA Road Construction Noise Model.
[2] Represents the combined noise level for all equipment assuming they operate at the same time 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.

TABLE 10-2: CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})					
	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Highest Levels[2]
R1	55.5	54.8	52.1	49.4	47.7	55.5
R2	49.1	48.4	45.7	43.0	41.3	49.1
R3	48.9	48.2	45.5	42.8	41.1	48.9
R4	51.7	51.0	48.3	45.6	43.9	51.7
R5	49.0	48.3	45.6	42.9	41.2	49.0
R6	49.6	48.9	46.2	43.5	41.8	49.6
R7	48.8	48.1	45.4	42.7	41.0	48.8

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

10.6 POCC PROJECT SITE CONSTRUCTION NOISE LEVEL COMPLIANCE

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

TABLE 10-3: POCC PROJECT 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	55.5	80	No
R2	49.1	80	No
R3	48.9	80	No
R4	51.7	80	No
R5	49.0	80	No
R6	49.6	80	No
R7	48.8	80	No

[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 POCC Project construction noise levels exceed the construction noise level threshold?

10.7 NIGHTTIME CONCRETE POUR NOISE ANALYSIS

It is our understanding that nighttime concrete pouring activities will occur as a part of POCC 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 as shown on Exhibit 10-B. Since the nighttime concrete pours will take place outside the hours permitted by Chapter 87.0905[e][1][c] of the City of Yucaipa Municipal Code, the POCC Project Applicant will be required to obtain authorization for nighttime work from the City of Yucaipa. 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)

10.7.1 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. 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, 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 POCC 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 POCC Project nighttime concrete pour noise activities.

10.7.2 NIGHTTIME CONCRETE POUR NOISE LEVEL COMPLIANCE

As shown on Table 10-4, the noise levels associated with the nighttime concrete pour activities are estimated to range from 24.3 to 31.7 dBA $L_{eq.}$ The analysis shows that the unmitigated nighttime concrete pour activities will satisfy 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 POCC Project construction nighttime concrete pour noise activity is considered *less than significant* at all receiver locations with prior authorization for nighttime work from the City of Yucaipa. Appendix 10.2 includes the CadnaA nighttime concrete pour noise model inputs.

EXHIBIT 10-B: POCC NIGHTTIME CONCRETE POUR NOISE SOURCE AND RECEIVER LOCATIONS

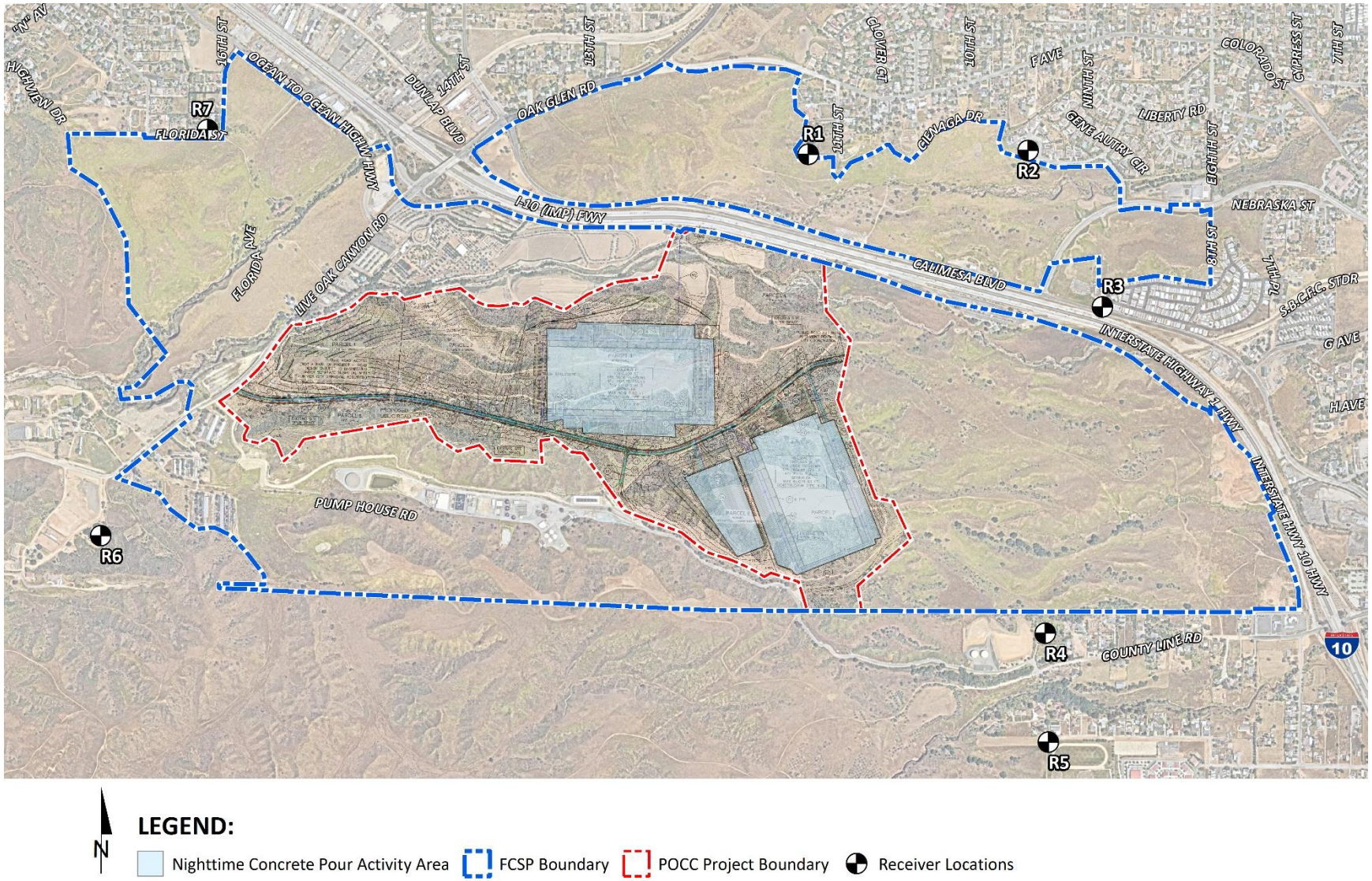


TABLE 10-4: POCC NIGHTTIME CONCRETE POUR NOISE LEVEL COMPLIANCE

Receiver Location[1]	Concrete Pour Construction Noise Levels (dBA L_{eq})		
	Exterior Noise Levels[2]	Threshold[3]	Threshold Exceeded?[4]
R1	31.7	70	No
R2	28.3	70	No
R3	29.3	70	No
R4	31.3	70	No
R5	29.2	70	No
R6	24.3	70	No
R7	25.0	70	No

[1] Construction noise source and receiver locations are shown on Exhibit 10-A.
[2] Nighttime Concrete Pour noise model inputs are included in Appendix 10.2.
[3] Construction noise level thresholds as shown on Table 4-1.
[4] Do the estimated POCC Project construction noise levels exceed the construction noise level threshold?

10.8 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 10-5. 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 10-5: 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

Table 10-6 presents the expected POCC Project related vibration levels at the nearby receiver locations. At distances ranging from 1,048 to 2,693 feet from POCC Project construction activities, construction vibration velocity levels are estimated to range from 0.000 to 0.001 in/sec PPV. Based on maximum acceptable continuous vibration threshold of 0.2 PPV (in/sec), the typical POCC Project construction vibration levels will fall below the building damage thresholds at all the sensitive receiver locations. Therefore, the POCC Project-related vibration impacts are considered *less than significant* during typical construction activities at the POCC Project site.

TABLE 10-6: POCC 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	Jack-hammer	Loaded Trucks	Large bulldozer	Vibratory Roller	Highest Vibration Level		
R1	1,048'	0.000	0.000	0.000	0.000	0.001	0.001	0.2	No
R2	2,462'	0.000	0.000	0.000	0.000	0.000	0.000	0.2	No
R3	2,693'	0.000	0.000	0.000	0.000	0.000	0.000	0.2	No
R4	1,736'	0.000	0.000	0.000	0.000	0.000	0.000	0.2	No
R5	2,412'	0.000	0.000	0.000	0.000	0.000	0.000	0.2	No
R6	1,832'	0.000	0.000	0.000	0.000	0.000	0.000	0.2	No
R7	2,259'	0.000	0.000	0.000	0.000	0.000	0.000	0.2	No

[1] Construction noise source and receiver locations are shown on Exhibit 10-A.
[2] Distance from receiver building facade to POCC Project construction boundary (POCC Project site boundary).
[3] Based on the Vibration Source Levels of Construction Equipment (Table 10-5).
[4] City of Yucaipa Municipal Code, Chapter 87.0910[a] (Appendix 3.1)
[5] Does the peak vibration exceed the acceptable vibration thresholds?
"PPV" = Peak Particle Velocity

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 POCC Project site perimeter.

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21. **Translutions.** *Freeway Corridor Specific Plan & Pacific Oak Commerce Center Traffic Impact Analysis, Translutions, Inc.* August 2023.

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

12 CERTIFICATIONS

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

Bill Lawson, P.E., INCE
Principal
URBAN CROSSROADS, INC.
1133 Camelback #8329
Newport Beach, CA 92658
(949) 581-3148
blawson@urbanxroads.com

EDUCATION

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

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

PROFESSIONAL REGISTRATIONS

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

PROFESSIONAL AFFILIATIONS

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

PROFESSIONAL CERTIFICATIONS

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

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APPENDIX 3.1:

CITY OF YUCAIPA MUNICIPAL CODE

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APPENDIX 5.1:

STUDY AREA PHOTOS

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APPENDIX 5.2:

NOISE MEASUREMENT WORKSHEETS

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APPENDIX 7.1:

OFF-SITE TRAFFIC NOISE CALCULATIONS

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APPENDIX 9.1:

OPERATIONAL NOISE CALCULATIONS

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APPENDIX 10.1:

CONSTRUCTION NOISE CALCULATIONS

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APPENDIX 10.2:

NIGHTTIME CONCRETE POUR NOISE CALCULATIONS

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