4.12 NOISE

4.12.1 Introduction

This section analyzes the potential noise impacts associated with the La Entrada Specific Plan (proposed project). The analysis in this section is based on the information provided in the *Noise Impact Analysis* for the La Entrada Specific Plan (LSA 2013). The *Noise Impact Analysis* is included in Appendix J of this Environmental Impact Report (EIR).

4.12.2 Methodology

Evaluation of noise impacts associated with the proposed project includes the following:

- Determine potential short-term construction noise impacts on off-site noise-sensitive uses;
- Determine potential long-term traffic noise impacts on on- and off-site noise-sensitive uses;
- Determine potential long-term stationary source noise impacts on on- and off-site noise-sensitive uses; and
- Determine the required mitigation measures to reduce short- and long-term noise impacts.

Characteristics of Sound. Noise is usually defined as unwanted sound. Noise consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation, and sleep.

To the human ear, sound has two significant characteristics: pitch and loudness. Pitch is generally an annoyance, while loudness can affect our ability to hear. Pitch is the number of complete vibrations, or cycles per second, of a wave resulting in the tone's range from high to low. Loudness is the strength of a sound that describes a noisy or quiet environment and is measured by the amplitude of the sound wave. Loudness is determined by the intensity of the sound waves, combined with the reception characteristics of the human ear. Sound intensity refers to how hard the sound wave strikes an object, which in turn produces the sound's effect. This characteristic of sound can be precisely measured with instruments. The analysis of a project defines the noise environment of the project area in terms of sound intensity and its effect on adjacent sensitive land uses.

Measurement of Sound. Sound is measured in decibels (dB), which are measured on a logarithmic scale representing points on a sharply rising curve. The decibel scale increases as the square of the change, representing the sound pressure energy. To explain further, 10 dB are 10 times more intense than 1 dB, 20 dB are 100 times more intense, and 30 dB are 1,000 times more intense than the acoustic energy of 1 dB.

The decibel system of measuring sound gives a rough connection between the physical intensity of sound and its perceived loudness to the human ear. A 10 dB increase in sound level is perceived by the human ear as only a doubling of the loudness of the sound. Sound intensity is measured through an A-weighted scale to correct for the relative frequency response of the human ear. That is, an A-weighted noise level deemphasizes low and very high frequencies of sound similar to the human ear's de-emphasis of these frequencies. Ambient sounds generally range from 30 A-weighted decibels (dBA) (very quiet) to 100 dBA (very loud).

Sound levels are generated from a source, and their decibel level decreases as the distance from that source increases. Sound dissipates exponentially with distance from the noise source. For a single-point source, sound levels decrease approximately 6 dBA for each doubling of distance from the source. This drop-off rate is appropriate for noise generated by stationary equipment. If noise is produced by a line source, such as highway traffic or railroad operations, the sound decreases 3 dBA for each doubling of distance in a hard site environment. Line source, noise in a relatively flat environment with absorptive vegetation, decreases 4.5 dBA for each doubling of distance.

There are many ways to rate noise for various time periods, but an appropriate rating of ambient noise affecting humans also accounts for the annoying effects of sound. Equivalent continuous sound level (L_{eq}) is the total sound energy of time-varying noise over a sample period. However, the predominant rating scales for human communities in the State of California are the L_{eq} and community noise equivalent level (CNEL) or the day-night average noise level (L_{dn}) based on dBA. CNEL is the time-varying noise over a 24-hour period, with a 5 dBA weighting factor applied to the hourly L_{eq} for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours) and a 10 dBA weighting factor applied to noise occurring from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). L_{dn} is similar to the CNEL scale, but without the adjustment for events occurring during the evening hours. CNEL and L_{dn} are within 1 dBA of each other and are normally exchangeable.

Other noise rating scales of importance when assessing the annoyance factor include the maximum noise level (L_{max}), which is the highest exponential time-averaged sound level that occurs during a stated time period. The noise environments discussed in this analysis for short-term noise impacts are specified in terms of maximum levels denoted by L_{max}, which reflects peak-operating conditions and addresses the annoying aspects of intermittent noise. It is often used together with another noise scale, or noise standards in terms of percentile noise levels, in noise ordinances for enforcement purposes. For example, the L_{10} noise level represents the noise level exceeded 10 percent of the time during a stated period. The L_{50} noise level represents the median noise level. Half the time the noise level exceeds this level, and half the time it is less than this level. So, for a relatively constant noise source, the L_{eq} and L_{50} are approximately the same. The L_{90} noise level represents the noise level exceeded 90 percent of the time and is considered the background noise level during a monitoring period. For a relatively constant noise source, the L_{eq} and L_{50} are approximately the same.

Noise impacts can be described in three categories. The first category includes audible impacts that refer to increases in noise levels noticeable to humans. Audible increases in noise levels generally refer to a change of 3 dB or greater since this level has been found to be barely perceptible in exterior environments. The second category, potentially audible, refers to a change in the noise level between 1 and 3 dB. This range of noise levels has been found to be noticeable only in laboratory environments. The last category includes changes in noise level of less than 1 dB, which are inaudible

to the human ear. Only audible changes in existing ambient or background noise levels are considered potentially significant under the California Environmental Quality Act (CEQA).

Physiological Effects of Noise. Physical damage to human hearing begins at prolonged exposure (typically more than 8 hours, as defined by the Occupational Safety and Health Administration [OSHA]) to noise levels higher than 85 dBA. Exposure to high noise levels affects the body's entire system, with prolonged noise exposure in excess of 75 dBA increasing body tensions, thereby affecting blood pressure and functions of the heart and the nervous system. In comparison, extended periods of noise exposure above 90 dBA would result in permanent cell damage. When the noise level reaches 120 dB, a tickling sensation occurs in the human ear even with short-term exposure. This level of noise is called the threshold of feeling. As the sound reaches 140 dB, the tickling sensation is replaced by the feeling of pain in the ear. This is called the threshold of pain. A sound level of 160 to 165 dB will result in dizziness or loss of equilibrium. The ambient or background noise problem is widespread and generally more concentrated in urban areas than in outlying less developed areas.

Table 4.12.A lists "Definitions of Acoustical Terms," and Table 4.12.B shows "Common Sound Levels and Their Noise Sources."

Vibration. Vibration refers to ground-borne noise and perceptible motion. Ground-borne vibration is almost exclusively a concern inside buildings and is rarely perceived as a problem outdoors, where the motion may be discernible, but without the effects associated with the shaking of a building there is less adverse reaction. Vibration energy propagates from a source through intervening soil and rock layers to the foundations of nearby buildings. The vibration then propagates from the foundation throughout the remainder of the structure. Building vibration may be perceived by the occupants as motion of building surfaces, rattling of items on shelves or hanging on walls, or as a low-frequency rumbling noise. The rumble noise is caused by the vibrating walls, floors, and ceilings radiating sound waves. Building damage is not a factor for normal transportation projects, including rail projects, with the occasional exception of blasting and pile driving during construction. Annoyance from vibration often occurs when the vibration exceeds the threshold of perception by 10 dB or less. This is an order of magnitude below the damage threshold for normal buildings.

Typical sources of ground-borne vibration are construction activities (e.g., blasting, pile driving and operating heavy duty earth-moving equipment), steel-wheeled trains, and occasional traffic on rough roads. Problems with ground-borne vibration and noise from these sources are usually localized to areas within approximately 100 feet (ft) from the vibration source, although there are examples of ground-borne vibration causing interference out to distances greater than 200 ft (FTA 2006). When roadways are smooth, vibration from traffic, even heavy trucks, is rarely perceptible. It is assumed for most projects that the roadway surface will be smooth enough that ground-borne vibration from street traffic will not exceed the impact criteria; however, both construction of the project and the freight train operations could result in ground-borne vibration that could be perceptible and annoying. Ground-borne noise is not likely to be a problem because noise arriving via the normal airborne path usually will be greater than ground-borne noise.

Table 4.12.A: Definitions of Acoustical Terms

Term	Definitions
Decibel, dB	A unit of level that denotes the ratio between two quantities that are proportional to power; the number of decibels is 10 times the logarithm (to the base 10) of this ratio.
Frequency, Hz	Of a function periodic in time, the number of times that the quantity repeats itself in one second (i.e., number of cycles per second).
A-Weighted Sound Level, dBA	The sound level obtained by use of A-weighting. The A-weighting filter deemphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted, unless reported otherwise.
L_2, L_8, L_{25}, L_{50}	The fast A-weighted noise levels that are equaled or exceeded by a fluctuating sound level 2 percent, 8 percent, 25 percent, and 50 percent of a stated time period.
Equivalent Continuous Noise Level, L_{eq}	The level of a steady sound that, in a stated time period and at a stated location, has the same A-weighted sound energy as the time-varying sound.
Community Noise Equivalent Level, CNEL	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 5 dBA to sound levels occurring in the evening from 7:00 p.m. to 10:00 p.m. and after the addition of 10 dBA to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
Day/Night Noise Level, L_{dn}	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 10 dBA to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
L_{max}, L_{min}	The maximum and minimum A-weighted sound levels measured on a sound level meter, during a designated time interval, using fast time averaging.
Ambient Noise Level	The all-encompassing noise associated with a given environment at a specified time, usually a composite of sound from many sources at many directions, near and far; no particular sound is dominant.
Intrusive	The noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: *Noise Impact Analysis*, LSA Associates, Inc. (June 2013).

Table 4.12.B: Common Sound Levels and their Noise Sources

Noise Source	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Evaluations[1]
Near Jet Engine	140	Deafening	128 times as loud
Civil Defense Siren	130	Threshold of Pain	64 times as loud
Hard Rock Band	120	Threshold of Feeling	32 times as loud
Accelerating Motorcycle at a Few Feet Away	110	Very Loud	16 times as loud
Pile Driver; Noisy Urban Street/ Heavy City Traffic	100	Very Loud	8 times as loud
Ambulance Siren; Food Blender	95	Very Loud	
Garbage Disposal	90	Very Loud	4 times as loud
Freight Cars; Living Room Music	85	Loud	
Pneumatic Drill; Vacuum Cleaner	80	Loud	2 times as loud
Busy Restaurant	75	Moderately Loud	
Near Freeway Auto Traffic	70	Moderately Loud	
Average Office	60	Quiet	One-half as loud
Suburban Street	55	Quiet	
Light Traffic; Soft Radio Music in Apartment	50	Quiet	One-quarter as loud
Large Transformer	45	Quiet	
Average Residence without Stereo Playing	40	Faint	One-eighth as loud
Soft Whisper	30	Faint	
Rustling Leaves	20	Very Faint	
Human Breathing	10	Very Faint	Threshold of Hearing
	0	Very Faint	

Source: *Noise Impact Analysis*, LSA Associates, Inc. (June 2013).
[1] As compared to 70 dBA. Use of 70 dBA as a point of reference in this table is for comparison purposes only.
dBA = A-weighted decibels

Ground-borne vibration has the potential to disturb people as well as to damage buildings. Although it is very rare for train-induced ground-borne vibration to cause even cosmetic building damage, it is not uncommon for construction processes such as blasting and pile driving to cause vibration of sufficient amplitudes to damage nearby buildings (FTA 2006). Ground-borne vibration is usually measured in terms of vibration velocity, either the root-mean-square (RMS) velocity or peak particle velocity (PPV). RMS is best for characterizing human response to building vibration and PPV is used to characterize potential for damage. Decibel notation acts to compress the range of numbers required to describe vibration. Vibration velocity level in decibels is defined as:

$$L_v = 20 \log_{10} [V/V_{ref}]$$

where L_v is the velocity in decibels (VdB), "V" is the RMS velocity amplitude, and "V_{ref}" is the reference velocity amplitude, or 1×10^{-6} inches/second used in the United States.

Factors that influence ground-borne vibration and noise include the following:

- **Vibration Source:** Vehicle suspension, wheel types and condition, track/roadway surface, track support system, speed, transit structure, and depth of vibration source
- **Vibration Path:** Soil type, rock layers, soil layering, depth to water table, and frost depth
- **Vibration Receiver:** Foundation type, building construction, and acoustical absorption

Among the factors listed above, there are significant differences in the vibration characteristics when the source is underground compared to at the ground surface. In addition, soil conditions are known to have a strong influence on the levels of ground-borne vibration. Among the most important factors are the stiffness and internal damping of the soil and the depth to bedrock.

Experience with ground-borne vibration is that vibration propagation is more efficient in stiff clay soils than in loose sandy soils, and shallow rock seems to concentrate the vibration energy close to the surface and can result in ground-borne vibration problems at large distances from the track. Factors such as layering of the soil and depth to water table can have significant effects on the propagation of ground-borne vibration. Soft, loose, sandy soils tend to attenuate more vibration energy than hard, rocky materials. Vibration propagation through groundwater is more efficient than through sandy soils.

4.12.3 Existing Environmental Setting

Land Uses on the Project Site and in the Project Vicinity. The project site is currently vacant and undeveloped. Man-made features include an abandoned segment of old United States Highways 60/70 (replaced by Interstate 10 [I-10]) along the northwestern portion of the site, an electrical transmission line adjacent to the southwestern border, and a smaller power line in the central portion of the property. There are no existing residences in the immediate vicinity of the project site; however, there are three existing residences along Avenue 50 between Tyler Street and Polk Street. Two of them are more than 200 ft away from the centerline of Avenue 50. The other one has its front edge approximately 100 ft from the centerline of Avenue 50. However, there is no noise-sensitive outdoor living area between the structure and the road. The backyard is shielded by the residential structures.

Overview of the Existing Noise Environment. As previously stated, the project site is vacant land. The primary existing noise sources in the project area are transportation facilities. Traffic on I-10, Avenue 50, and local streets is the dominant source of ambient noise.

Table 4.12.C provides the traffic noise levels along the roadways adjacent to the project site under the existing conditions. These noise levels are representative of the worst-cast scenario, which assumes that no shielding exists between the traffic and the locations where the noise contours are drawn.

As seen in Table 4.12.C, existing traffic noise levels along roadway segments in the project vicinity are low, with the 70 dBA CNEL confined within the roadway right-of-way (ROW) with the exception of traffic noise levels adjacent to I-10, where the 70 dBA CNEL extends to 308 ft from the roadway centerline.

Table 4.12.C: Existing Traffic Noise Levels

Roadway Segment	ADT	Centerline to 70 CNEL (ft)	Centerline to 65 CNEL (ft)	Centerline to 60 CNEL (ft)	CNEL (dBA) 50 ft from Centerline of Outermost Lane
Avenue 50 between Tyler St. and Polk St. (Secondary)	710	< 50	< 50	< 50	53.5
Avenue 50 between Polk St. and Fillmore St. (Secondary)	450	< 50	< 50	< 50	51.5
Avenue 50 between Fillmore St. and Street C (Secondary)	40	< 50	< 50	< 50	41.0
Fillmore St. between Avenue 50 and Avenue 52 (Arterial)	310	< 50	< 50	< 50	49.9
Fillmore St. between Avenue 52 and Avenue 53 (Arterial)	770	< 50	< 50	< 50	53.8
Fillmore St. between Avenue 53 and Airport Blvd. (Arterial)	720	< 50	< 50	< 50	53.5
Fillmore St. south of Airport Blvd. (Arterial)	830	< 50	< 50	< 50	54.1
Avenue 52 between Fillmore St. and Pierce St. (Arterial)	40	< 50	< 50	< 50	41.0
Avenue 53 between Fillmore St. and Pierce St. (Arterial)	120	< 50	< 50	< 50	45.8
Pierce St. between Avenue 52 and Avenue 53 (Arterial)	20	< 50	< 50	< 50	38.0
Pierce St. between Avenue 53 and Avenue 54 (Arterial)	100	< 50	< 50	< 50	45.0
Pierce St. between Avenue 54 and Airport Blvd. (Arterial)	180	< 50	< 50	< 50	47.5
I-10 Freeway	29,000	420	905	1,948	81.7

Source: *Noise Impact Analysis*, LSA Associates, Inc. (June 2013).
Note: Traffic noise within 50 ft of the roadway centerline should be evaluated with site-specific information.
ADT = average daily traffic
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels
ft = feet
I-10 = Interstate 10

4.12.4 Regulatory Setting

Federal Policies and Regulations.

United States Environmental Protection Agency (EPA). In 1972, Congress enacted the Noise Control Act. This act authorized the EPA to publish descriptive data on the effects of noise and establish levels of sound "requisite to protect the public welfare with an adequate margin of safety." These levels are separated into health (hearing loss levels) and welfare (annoyance levels), as shown in Table 4.12.D. The EPA cautions that these identified levels are not standards because they do not take into account the cost or feasibility of the levels.

For protection against hearing loss, 96 percent of the population would be protected if sound levels are less than or equal to L_{eq} (24) of 70 dBA. The "(24)" signifies an L_{eq} duration of 24 hours. The EPA activity and interference guidelines are designed to ensure reliable speech communication at approximately 5 ft in the outdoor environment. For outdoor and indoor

Table 4.12.D: Summary of EPA Noise Levels for Public Protection

Effect	Level	Area
Hearing loss	$L_{eq}(24) < 70$ dB	All areas.
Outdoor activity interference and annoyance	$L_{dn} < 55$ dB	Outdoors in residential areas, farms, other outdoor areas where people spend widely varying amounts of time, and other places in which quiet is a basis for use.
	$L_{eq}(24) < 55$ dB	Outdoor areas where people spend limited amounts of time, such as school yards, playgrounds, etc.
Indoor activity interference and annoyance	$L_{eq} < 45$ dB	Indoor residential areas.
	$L_{eq}(24) < 45$ dB	Other indoor areas with human activities such as schools, etc.

Source: "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety," United States Environmental Protection Agency (March 1974).
(24) = 24-hour exposure
L_{eq} = equivalent continuous sound level
dB = decibels
EPA = United States Environmental Protection Agency
L_{dn} = day-night average noise level

environments, interference with activity and annoyance should not occur if levels are below 55 dBA and 45 dBA, respectively.

The noise effects associated with an outdoor L_{dn} of 55 dBA are summarized in Table 4.12.E. At 55 dBA L_{dn}, 95 percent sentence clarity (intelligibility) may be expected at 11 ft, and no community reaction. However, 1 percent of the population may complain about noise at this level, and 17 percent may indicate annoyance.

Table 4.12.E: Summary of Human Effects in Areas Exposed to 55 dBA L_{dn}

Type of Effects	Magnitude of Effect
Speech – Indoors	100 percent sentence intelligibility (average) with a 5 dB margin of safety.
Speech – Outdoors	100 percent sentence intelligibility (average) at 0.35 meters. 99 percent sentence intelligibility (average) at 1.0 meters. 95 percent sentence intelligibility (average) at 3.5 meters.
Average Community Reaction	None evident; 7 dB below level of significant complaints and threats of legal action, and at least 16 dB below "vigorous action."
Complaints	1 percent dependent on attitude and other non-level related factors.
Annoyance	17 percent dependent on attitude and other non-level related factors.
Attitude Towards Area	Noise essentially the least important of various factors.

Source: "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety," United States Environmental Protection Agency (March 1974).
dB = decibels
L_{dn} = day-night average noise level
dBA = A-weighted decibels

State Policies and Regulations.

State of California. The State of California has established regulations that help prevent adverse impacts to occupants of buildings located near noise sources. Referred to as the "State Noise Insulation Standard," it requires buildings to meet performance standards through design and/or building materials that would offset any noise source in the vicinity of the receptor. State regulations include requirements for the construction of new hotels, motels, apartment houses,

and dwellings other than detached single-family dwellings that are intended to limit the extent of noise transmitted into habitable spaces. These requirements are found in California Code of Regulations (CCR) Title 24 (known as the California Building Standards Code), Part 2 (known as the California Building Code [CBC]), Appendix Chapter 12.

California Health and Safety Code, Division 28, Noise Control Act. The California Noise Control Act states that excessive noise is a serious hazard to public health and welfare and that it is the policy of the State to provide an environment for all Californians that is free from noise that jeopardizes their health or welfare. The goal is to minimize the number of people that would be exposed to excessive noise but not to create an environment completely free from any noise.

California Government Code Section 65302. Section 65302(f) of the California Government Code and the Guidelines for the Preparation and Content of the Noise Element of the General Plan prepared by the California Department of Health Services and included in the 1990 State of California General Plan Guidelines published by the State Office of Planning and Research provide requirements and guidance to local agencies in the preparation of their Noise Elements.

The Guidelines require that major noise sources and areas containing noise-sensitive land uses be identified and quantified by preparing generalized noise exposure contours for current and projected conditions. Contours may be prepared in terms of either the CNEL or the day-night average level (L_{dn}), which are descriptors of total noise exposure at a given location for an annual average day. The CNEL and L_{dn} are generally considered to be equivalent descriptors of the community noise environment within ±1.0 dB.

Local and Regional Plans and Policies.

City of Coachella General Plan Noise Element. The adopted Coachella General Plan 2020 (September 1996) has an Environmental Hazards and Safety Element that contains noise standards. In addition, Figure 53 in the Environmental Hazards and Safety Element depicts the Design Noise Levels for City of Coachella.

> **Policy:** The City shall require noise control plans for new development located within the 60 CNEL contour (approximately 550 ft) of the centerline of major arterial roadways, 370 ft of the centerline of arterial roadways and 225 ft of collectors.
>
> **Policy:** The City may require an acoustical analysis in compliance with the California Administrative Code Title 25, for proposed residential developments. The analysis shall be prepared under the supervision of a person experienced in the field of acoustical engineering and shall evaluate existing and projected noise levels, as well as, recommend noise attenuation measures.

City of Coachella Municipal Code. Municipal Code, Chapter 7.04 – Noise Control establishes the sound level limits as related to fixed noise sources, as shown in Table 4.12.F. It states that:

Table 4.12.F: Municipal Code Sound Level Limits as Related to Fixed Noise Sources

Zone	Time	Applicable 10-Minute Average Decibel Limit (A-weighted)
Residential – All zones	6:00 a.m. to 10:00 p.m. 10:00 p.m. to 6:00 a.m.	55 45
Commercial – All zones	6:00 a.m. to 10:00 p.m. 10:00 p.m. to 6:00 a.m.	65 55

Source: City of Coachella Municipal Code, Chapter 7.04.

> Regardless of whether an objective measurement by sound level meter is involved, it shall be unlawful for any person to make, continue, or cause to be made or continued, within the City limits any disturbing excessive or offensive noise or vibration which causes discomfort or annoyance to any reasonable person of normal sensitivity residing in the area of that is plainly audible at a distance greater than fifty (50) feet from the sources point for any purpose. The following ten-minute average sound level limits unless otherwise specifically indicated, shall apply as indicated in the following table as it relates to a fixed noise source or leaf blowers pursuant to Section 7.04.075.

It also states that, "If the measured ambient noise level exceeds the applicable limit as noted in the table in subsection (A) of this section, the allowable average sound level shall be the ambient noise level. The ambient noise level shall be measured when the alleged noise violation sources are not operating." Finally, it states that, "The sound level limit between two zoning districts shall be measured at the higher allowable district."

The City's Municipal Code noise level limits have special provisions to exempt certain activities or events, including construction activities. Sub-Chapter 7.04.070 – Construction Activities, states that:

> No person shall perform, nor shall any person be employed, nor shall any person cause any other person to be employed to work for which a building permit is required by the City in any work of construction, erection, demolition, alteration, repair, addition to or improvement of any building, structure, road, or improvement to realty except between the hours as set forth as follows:
>
> - **October 1 through April 30**
> Monday–Friday: 6:00 a.m. to 5:30 p.m.
> Saturday: 8:00 a.m. to 5:00 p.m.
> Sunday: 8:00 a.m. to 5:00 p.m.
> Holidays: 8:00 a.m. to 5:00 p.m.
> - **May 1 through September 30**
> Monday–Friday: 5:00 a.m. to 7:00 p.m.
> Saturday: 8:00 a.m. to 5:00 p.m.
> Sunday: 8:00 a.m. to 5:00 p.m.
> Holidays: 8:00 a.m. to 5:00 p.m.

Emergency work and/or unusual conditions may cause work to be permitted with the consent of the City manager, or his or her designee, upon recommendation of the building director or the City engineer.

4.12.5 Vibration Impact Criteria

The criteria for environmental impact from ground-borne vibration and noise are based on the maximum levels for a single event.

Federal Transit Administration and Federal Railroad Administration. Both the Federal Transit Administration (FTA) in its *Transit Noise and Vibration Impact Assessment* (FTA 2006) and the Federal Railroad Administration (FRA) in its High-Speed Ground Transportation Noise and Vibration Impact Assessment (FRA, December 1998) included ground-borne vibration and noise impact criteria guidance, as shown in Table 4.12.G. The criteria presented in Table 4.12.G account for variation in project types, as well as the frequency of events, which differ widely among transit projects. Most experience is with the community response to ground-borne vibration from rail rapid transit systems, with typical headways in the range of three to ten minutes and each vibration event lasting less than ten seconds. It is intuitive that when there will be fewer events each day, as is typical for commuter rail projects, it should take higher vibration levels to evoke the same community response. This is accounted for in the criteria by distinguishing between projects with frequent and infrequent events, where the term "frequent events" is defined as more than 70 events per day. Most commuter rail projects will fall into the infrequent event category, although some commuter rail lines serving major cities are in the frequent event category.

Table 4.12.G: Ground-Borne Vibration and Noise Impact Criteria

Land Use Category	Ground-Borne Vibration Impact Levels (VdB re 1 microinch/sec)		Ground-Borne Noise Impact Levels (dB re 20 µPa)	
	Frequent[1] Events	Infrequent[2] Events	Frequent[1] Events	Infrequent[2] Events
Category 1: Buildings where low ambient vibration is essential for interior operations.	65 VdB3	65 VdB3	–4	–4
Category 2: Residences and buildings where people normally sleep.	72 VdB	80 VdB	35 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use.	75 VdB	83 VdB	40 dBA	48 dBA

Source: Federal Transit Administration (2006).

1 Frequent Events are defined as more than 70 events per day.

2 Infrequent Events are defined as fewer than 70 events per day.

3 This criterion limit is based on levels that are acceptable for most moderately sensitive equipment, such as optical microscopes. Vibration sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the heating, ventilation, and air conditioning (HVAC) systems and stiffened floors.

4 Vibration-sensitive equipment is not sensitive to ground-borne noise.

µPa = micro Pascals
dBA = A-weighted decibels
microinch/sec = microinches per second
VdB - vibration velocity decibels

4.12.6 Project Design Features

As summarized in Chapter 3.0, Project Description, the proposed Specific Plan includes components that are referred to as Project Design Features. Primary Project Design Features related to noise include:

The Specific Plan is proposed to be developed in phases, which include five mass grading phases and five development phases. The initial Phase 1 grading would be limited to the area necessary to achieve balanced site and proper drainage, thereby reducing the noise impacts associated with mass grading during the interim implementation phase.

- The Specific Plan will be constructed in compliance with all applicable provisions in the City's Municipal Code, including observing all time limitations on construction noise that exceeds Base Ambient Noise Levels.
- Based on a design-level acoustical study, all residential structures built on the project site shall incorporate design measures to ensure that interior noise levels for residential development do not exceed 45 dBA, in accordance with Title 25 (California Noise Insulation Standards) and the City's Municipal Code (Title 7).
- During the preparation of construction drawings for project-specific development, the exact acoustical specifications for window glass in buildings with unshielded first- and second-floor windows shall be determined pursuant to an acoustical study, pursuant to the requirements of the City's General Plan and the City's Municipal Code.

4.12.7 Thresholds of Significance

The following thresholds of significance criteria are based on Appendix G of the *CEQA Guidelines*. Based on these thresholds, implementation of the proposed project would have a significant adverse impact related to noise if it would:

Threshold 4.12.1: Expose persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;

Threshold 4.12.2: Expose persons to or generation of excessive ground-borne vibration or ground-borne noise levels;

Threshold 4.12.3: A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;

Threshold 4.12.4: A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;

Threshold 4.12.5: For a project located within 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; or

Threshold 4.12.6: For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels.

4.12.8 Project Impacts

Threshold 4.12.1: Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies

Less Than Significant Impact With Mitigation During Construction.

Construction Traffic. The proposed project would result in short-term noise impacts associated with construction activities. Two types of short-term noise impacts could occur during construction of the proposed project. First, construction crew commute and the transport of construction equipment and materials to the site for the proposed project would incrementally increase noise levels on access roads leading to the site. Truck traffic associated with project construction would be limited to within the permitted construction hours, as listed in the City's Municipal Code, Sub-Chapter 7.04.070, Construction Activities, and identified in the project design features. Although there would be a relatively high single-event noise exposure potential at a maximum of 87 dBA L_{max} at 50 ft from passing trucks, causing possible short-term intermittent annoyances, the effect on ambient noise levels would be less than 1 dBA when averaged over one hour or 24 hours. In other words, the changes in noise levels over 1 hour or 24 hours attributable to passing trucks would not be perceptible to the normal human ear. Therefore, short-term construction-related impacts associated with worker commute and equipment transport on local streets leading to the project site would result in a less than significant impact on noise-sensitive receptors along the access routes.

Construction Activities. The second type of short-term noise impact is related to noise generated during excavation, grading, and construction. Construction is performed in discrete steps, each of which has its own mix of equipment and, consequently, its own noise characteristics. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase (refer to Table E in the *Noise Impact Analysis* for typical construction equipment noise levels). At 100 ft from the noise source, construction noise levels drop by 6 dBA to 85 dBA L_{max}.

The site preparation phase, which includes grading and paving, tends to generate the highest noise levels, since the noisiest construction equipment is earthmoving equipment. Earthmoving equipment includes excavating machinery such as backhoes, bulldozers, and front loaders. Earthmoving and compacting equipment includes compactors, scrapers, and graders. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full power operation followed by 3 or 4 minutes at lower power settings. Construction of the proposed project is expected to require the use of scrapers, bulldozers, motor grader, and water and pickup trucks. Noise associated with the use of construction equipment is estimated to reach between 79 and 89 dBA L_{max} at a distance of 50 ft from the active construction area for the grading phase. The maximum noise level generated by each scraper is assumed to be approximately 87 dBA L_{max} at 50 ft from the scraper in operation. Each bulldozer would also generate approximately 85 dBA L_{max} at 50 ft. The maximum noise level generated by the sound sources with equal strength increases the noise level by 3 dBA. The worst-case combined noise level during this phase of construction would be 91 dBA L_{max} at a distance of 50 ft from an active construction area.

The closest sensitive receptors to the project's construction area are three (3) residences located along Avenues 50 and 52 near the western boundary of the project site at a distance of 100 ft. At this distance, these receptor locations would be exposed to construction noise levels of up to 85 dBA L_{max} during site preparation. In addition, residences constructed in earlier project phases within 100 ft of an active construction area would be exposed to construction noise levels of up to 85 dBA L_{max} during site preparation of later phases. After site preparation is completed for each individual Specific Plan phase, other construction activities would generate lower noise levels. Noise generated during construction phases would be in compliance with the time periods specified in the City's Municipal Code.

It is recognized by municipalities that it is not possible to reduce construction noise levels to City standards for fixed sources (refer to Local and Regional Plans and Policies and 4.12.4, above). As a result, the City of Coachella, like numerous cities throughout California, has established time periods when construction can occur to minimize disturbance to sensitive receptors (City of Coachella Municipal Code, Chapter 7.04, Noise Control, and Section 7.04.075, Construction Activities). Construction noise sources are not stationary, and therefore, high noise levels would not persist in one particular location. Furthermore, high noise levels generated during the site preparation phase would occur over a short time of the overall construction period (site preparation is assumed to occur over 7 months, or approximately 5 percent of the total 136 months for the entire construction for each project phase). Although the noise reduction potential will be project and site specific, the following measures would further reduce noise impacts during the project construction period to less than significant:

- Use of manufacturer-certified mufflers would generally reduce the construction equipment noise by 8 to 10 dBA;
- Noise reduction from directing the equipment away from sensitive receptors will depend on the distance and directivity of the equipment noise emissions; and
- Locating the staging area away from sensitive receptors will also reduce the noise levels, depending on the distance involved and whether any intervening structures exist.

For these reasons, compliance with the City's construction time periods specified in Mitigation Measure 4.12.1 is considered adequate to reduce construction-related noise impacts to a less than significant level.

Less Than Significant Impact with Mitigation During Operation.

Off-Site Traffic Noise Impacts. The project-related vehicle trips would be distributed to area roadways. Tables 4.12.H through 4.12.P list the traffic noise levels for the existing plus project, and 2020, 2030, and 2035 (these years coincide with years in the traffic study for Phases 1 and 2, Phases 3 and 4, and Phases 1 through 5) without and with project conditions, respectively. (These tables are provided at the end of the section to enhance the section's readability.) Tables 4.12.I and 4.12.J also show the without and with I-10 Interchange at Avenue 50 conditions. Table 4.12.I addresses full build out of the proposed Specific Plan (Phases 1 through 5) without the future interchange project as a worst-case analysis even though Phase 5 could not proceed without

construction of the proposed future I-10 interchange (see Chapter 3.0, Project Description). Tables 4.12.H through 4.12.P show noise levels that would occur with or without the project.

The existing plus project traffic conditions would result in substantial increases in traffic noise levels along the majority of the roadway segments leading to the project site due to the increases in traffic associated with the proposed project. This is due to the omission of future ambient traffic volume growth in the baseline condition. Existing plus project traffic noise level increases over the existing baseline condition would range up to 27.1 dBA compared to up to 5.1 dBA increases in the future (2020, 2030, and 2035) year scenarios.

For the future (2020, 2030, and 2035) with project scenarios, the following off-site roadway segments would experience traffic noise level increases exceeding 3 dBA:

- Avenue 50 between Tyler Street and Polk Street: 2020 (+3.3 dBA)
- Avenue 50 between Polk Street and Fillmore Street: 2020 (+3.3 dBA)
- Avenue 50 between Fillmore Street and Street C: 2020 (+4.7 dBA), 2030 (+4.6 dBA), 2035 (+4.5 dBA)
- Avenue 52 between Fillmore Street and Pierce Street: 2020 (+4.5 dBA), 2030 (+4.2 dBA), 2035 (+4.2 dBA)

However, there are no existing noise-sensitive land uses along Avenue 50 between Fillmore Street and Street C, along Avenue 50 between Polk Street and Fillmore Street, or along Avenue 52 between Fillmore Street and Pierce Street. Based on information provided by the City, there are no planned sensitive uses at these locations (refer to Figure 4.1 and Table 4.A). Therefore, no potential traffic noise impacts would occur that would affect sensitive noise receptors along these roadway segments.

There are three (3) existing residences along Avenue 50 between Tyler Street and Polk Street. Two of them are more than 200 ft away from the centerline of Avenue 50 and would not be impacted by the projected 65 dBA CNEL traffic noise contour under the 2020 scenario, which has the highest increase in dBA (refer to the bulleted list above). The other one has its front edge approximately 100 ft from the centerline of Avenue 50. However, there is no noise-sensitive outdoor living area between the structure and the road. The backyard is shielded by the off-site residences and would not be exposed to traffic noise exceeding 65 dBA CNEL under the 2020 scenario. Therefore, no significant off-site traffic noise impacts would occur as a result of the proposed project, and no mitigation measures would be required for off-site sensitive land uses.

On-Site Operational Traffic Noise Impacts. Refer to Figure 3.3, Conceptual Land Use Plan, in Section 3.0, Project Description, for the locations of the proposed development use Planning Areas discussed in this section. The following street segments would have potential traffic noise impacts on the proposed on-site uses: Avenue 50 between Fillmore Street and Street C (G3 Open Space and G2 Parks/Recreation), Avenue 50 between Street C and Street A (G2 Parks/Recreation, G12 Medium Density Residential, and G9, G10, and G11, Mixed Use), Avenue 50 between Street A and the I-10 Eastbound Ramp (G7 and G8 Mixed Use), and I-10 (G1 Parks/Recreation, G5 High Density Residential, G6 Mixed Use, G7 Mixed Use, G8 High Density

Residential, G19 Medium Density Residential, G20 Low Density Residential, and G21 Open Space).

To determine the potential traffic noise impact on the proposed residential uses, the *Noise Impact Analysis* was conducted using the projected traffic volumes along the roads that abut the project site. The 2030 With Project condition (Table 4.12.N) yields the highest traffic volumes along Avenue 50 between Fillmore Street and Street A, and the 2035 With Project condition (Table 4.12.P) yields the highest traffic volume along Avenue 50 between Street A and the I-10 eastbound ramp and I-10 in the project vicinity. These noise levels represent the worst-case scenario, which assumes that no shielding (wall, barrier, slope, etc.) is provided between traffic and the location where the noise contours are drawn.

Adjacent to Avenue 50. As shown in Table 4.12.N, dwelling units proposed in the Medium Density Residential Planning Area of G12 that are within 256 ft of the Avenue 50 centerline would be exposed to traffic noise exceeding the exterior noise standards for residential uses (over a 24-hour period). In order to reduce exterior noise levels to 60 dBA CNEL or lower, sound walls would need to be constructed for residential units with outdoor living areas (backyard, patio, balcony, or deck). If the dwelling units are constructed with only ground-floor outdoor areas (i.e., backyards/patios/decks), then the sound wall would need to be constructed to the corresponding height below. If the dwelling units are constructed with both ground-floor and upper-floor outdoor areas (i.e., balconies), then the sound walls would be required for the upper floor outdoor active use areas as well, as detailed below. These sound walls are recommended to reduce the traffic noise levels in the outdoor active use areas to 60 dBA CNEL or lower to meet the City's exterior noise standard of 60 dBA CNEL.

- **Areas Exceeding 70 dBA CNEL (within 58 ft from centerline of Avenue 50):** An 8 ft high sound wall for ground-level outdoor areas and a 5 ft high sound wall for upper-floor outdoor areas (e.g., balconies). The 8 ft high sound wall is for the ground-floor outdoor active use areas (e.g., patios or backyards). It would be built along the perimeter of the patio or along the property line for the backyard or patio. The 5 ft high noise barrier would be built along the perimeter of the balcony or deck that is exposed to high traffic noise levels.
- **Areas Exceeding 65 dBA CNEL (within 120 ft from centerline of Avenue 50): A** 6 ft high sound wall for ground-level outdoor areas and a 5 ft high sound wall for upper-floor outdoor areas.
- **Areas Exceeding 60 dBA CNEL (within 256 ft from centerline of Avenue 50): A** 5 ft high sound wall would be built along the perimeter of the patio or along the property line for the backyard or patio. The 5 ft high noise barrier would be built along the perimeter of the balcony or deck that is exposed to high traffic noise levels.

Based on the data provided in the EPA Protective Noise Levels (EPA 550/9-79-100, November 1979), standard homes in Southern California provide at least 12 dBA of exterior-to-interior noise attenuation with windows open and 24 dBA with windows closed. Therefore, building upgrades are required for residential structures that would experience interior noise levels exceeding the 45 dBA CNEL noise standard (24 hour period) when windows are closed. For example, outdoor walls would be constructed to attenuate higher levels of noise, and/or double-paned windows and

air-conditioning units would be installed. Residential structures that would be exposed to exterior noise exceeding 69 dBA CNEL (within 68 ft of Avenue 50 centerline) would require upgrades. Mitigation Measure 4.12.3 (provided later in this section) includes the requirement for site-specific noise analyses prior to approval of the Tentative Tract Map in order to fine tune the noise reduction features. Implementation of this mitigation measure would ensure that both the exterior and interior noise standards are met through a detailed acoustical impact study based on the tract map and grading information.

A variety of specific mixed-uses are proposed within the Mixed-Use Planning Areas (G7, G8, G9, G10, and G11), including retail commercial, office commercial, high-density residential and community/public facilities along Avenue 50. However, specific mitigation measures for these specific land uses directly adjacent to Avenue 50 would be determined on a case-by-case basis. If there are residential uses proposed within G9, G10, and G11 that are within the noise impact Planning Areas identified above, these residential units would be subject to the same sound walls and/or interior upgrade requirements described above. Commercial uses and open space are not considered noise-sensitive and would not be required to have any sound walls or interior upgrades along Avenue 50. Depending on the location of the recreational facility within the parks/ recreation areas, sound walls and/or interior upgrades may be required if they are located within the 65 dBA CNEL impact areas.

Mitigation Measure 4.12.2 includes the specific structural upgrades for sensitive uses within Planning Areas G12, G9, G10, and G11 to reduce potential noise levels to exterior noise levels to 60 dBA CNEL or lower and interior noise levels to 45 dBA CNEL or lower, assuming no shielding (buildings, etc.) are placed between the sensitive receptors and the roadway. Placement of a commercial building between the roadway and sensitive receptors may reduce traffic noise levels at the sensitive receptors. Therefore, depending on the layout of each Planning Area, noise levels could be reduced further at sensitive receptor locations, and sound walls could be modified. Mitigation Measure 4.12.2 includes the requirement for site-specific noise analyses prior to approval of the Tentative Tract Map in order to fine-tune the noise reduction features. Implementation of Mitigation Measure 4.12.2 would reduce potentially significant noise impacts to less than significant levels at these Planning Areas.

For residential units proposed within the G6 and G7 Mixed-Use Planning Areas that are potentially impacted by traffic noise from Avenue 50, the following sound walls would be required:

- **Areas Exceeding 70 dBA CNEL (within 54 ft from centerline of Avenue 50):** An 8 ft high sound wall for ground-level outdoor areas and a 5 ft high sound wall for upper-floor outdoor areas. The 8 ft high sound wall is for ground-floor outdoor active use areas (e.g., patios or backyards). It would be built along the perimeter of the patio or along the property line for the backyard or patio. The 5 ft high noise barrier would be built along the perimeter of the balcony or deck that is exposed to high traffic noise levels.
- **Areas Exceeding 65 dBA CNEL (within 110 ft from centerline of Avenue 50): A** 6 ft high sound wall for ground-level outdoor areas and a 5 ft high sound wall for upper-floor outdoor areas.

- **Areas Exceeding 60 dBA CNEL (within 235 ft from centerline of Avenue 50):** A 5 ft high sound wall would be built along the perimeter of the patio or along the property line for the backyard or patio. The 5 ft high noise barrier would be built along the perimeter of the balcony or deck that is exposed to high traffic noise levels.

Building upgrades are required for residential structures that would experience interior noise levels exceeding the 45 dBA CNEL noise standard when windows are closed (i.e., higher grade of insulation in outdoor walls, and/or double-paned windows and air-conditioning units). Residential structures that would be exposed to exterior noise exceeding 69 dBA CNEL (within 63 ft of Avenue 50 centerline) would require upgrades.

Even with the recommended sound walls implemented, residential units along Avenue 50 would still be exposed to traffic noise exceeding 57 dBA CNEL. With windows open, rooms exposed to traffic noise higher than 57 dBA CNEL would not meet the 45 dBA CNEL interior noise standard. In order to ensure that windows can remain closed for prolonged periods of time, a mechanical ventilation system, such as an air-conditioning system, would be required to achieve the interior noise standard of 45 dBA CNEL. Since all frontline dwelling units along Avenue 50 are expected to be exposed to traffic noise higher than 57 dBA CNEL, an air-conditioning system is required for residential structures directly adjacent to Avenue 50.

Mitigation Measure 4.12.3 includes the specific upgrades for Planning Areas G6 and G7 to reduce potential noise levels to exterior noise levels to 60 dBA CNEL or lower and interior noise levels to 45 dBA CNEL or lower. Depending on the layout of each Planning Area, noise levels could be reduced further at sensitive receptor locations. Mitigation Measure 4.12.3 includes the requirement for site-specific noise analyses prior to approval of the Tentative Tract Map in order to fine-tune the noise reduction features. These mitigation measures would include the construction of stand-alone sound walls and/or building façade enhancements so that both the 60 dBA CNEL exterior noise standard and the 45 dBA CNEL standard are met. Therefore, with implementation of Mitigation Measure 4.12.3, a less than significant noise impact would occur at these Planning Areas.

Interstate 10. Based on Table 4.12.P, dwelling units proposed in G5 (High Density Residential), G8 (High Density Residential), G19 (Medium Density Residential), and G20 (Low Density Residential) that are within 2,871 ft, 1,333 ft, and 619 ft of the I-10 centerline would be exposed to traffic noise exceeding the 60, 65, and 70 dBA CNEL, respectively, exterior noise standards for residential uses. In order to reduce exterior noise levels to 60 dBA CNEL or lower, the following sound wall heights would be required for residential units with outdoor living areas (backyard, patio, balcony, or deck) along the segments of I-10 that are within the impact area:

- **Areas Exceeding 70 dBA CNEL (within 619 ft from centerline of I-10):** An 8 ft high sound wall for ground-level outdoor areas and a 5 ft high sound wall for upper-floor outdoor areas. The 8 ft high sound wall is for the ground-floor outdoor active use areas (e.g., patios or backyards). It would be built along the perimeter of the patio or along the property line for the backyard or patio. The 5 ft high noise barrier would be built along the perimeter of the balcony or deck that is exposed to high traffic noise levels. This noise barrier can consist of Plexiglas or other transparent materials with sufficient density to block noise.

- **Areas Exceeding 65 dBA CNEL (within 1,333 ft from centerline of I-10): A** 6 ft high sound wall for ground-level outdoor areas and a 5 ft high sound wall for upper-floor outdoor areas.
- **Areas Exceeding 60 dBA CNEL (within 2,871 ft from centerline of I-10):** A 5 ft high sound wall would be built along the perimeter of the patio or along the property line for the backyard or patio. The 5 ft high noise barrier would be built along the perimeter of the balcony or deck that is exposed to high traffic noise levels.

Building upgrades are required for residential structures that would experience interior noise levels exceeding the 45 dBA CNEL noise standard when windows are closed (i.e., higher grade of insulation in outdoor walls, and/or double-paned windows and air-conditioning units). Residential structures that would be exposed to exterior noise exceeding 69 dBA CNEL (within 722 ft of the I-10 centerline) would require upgrades. Sound walls are recommended to reduce the traffic noise levels in the outdoor active use areas to 60 dBA CNEL or lower to meet the City's exterior noise standard of 60 dBA CNEL. Building façade upgrades are recommended to reduce interior noise attributable to exterior sources to 45 dBA CNEL or lower to meet the City's interior noise standard.

Since it is not known at this time what specific types of mixed uses would be developed within the proposed Mixed-Use Planning Areas G6 and G7 along I-10, it is not feasible to identify location-specific sound reduction mitigation measures for the future land uses directly adjacent to I-10. However, if there are residential uses proposed within G6 and G7 that are within the noise impact areas identified above, these residential units would be subject to the same noise mitigation measures as described above. Commercial uses and open space are not considered noise sensitive and would not be required to have any mitigation measures along I-10. Depending on the location of the recreational facility within the parks/recreation areas, mitigation measures may be required if they are located with the 65 dBA CNEL impact areas.

Even with the recommended sound walls implemented, residential units along I-10 would still be exposed to traffic noise exceeding 57 dBA CNEL. With windows open, rooms exposed to traffic noise higher than 57 dBA CNEL would not meet the 45 dBA CNEL interior noise standard. In order to ensure that windows can remain closed for prolonged periods of time, a mechanical ventilation system, such as an air-conditioning system, would be required to achieve the interior noise standard of 45 dBA CNEL. Since all frontline dwelling units along I-10 are expected to be exposed to traffic noise higher than 57 dBA CNEL, an air-conditioning system is required for residential structures directly adjacent to I-10.

Mitigation Measure 4.12.4 includes the specific upgrades for Planning Areas G5, G8, G19, and G20 to reduce potential noise levels to exterior noise levels to 60 dBA CNEL or lower and interior noise levels to 45 dBA CNEL or lower. Depending on the layout of each Planning Area, noise levels could be reduced further at sensitive receptor locations. Mitigation Measure 4.12.4 includes the requirement for site-specific noise analyses prior to approval of the Tentative Tract Map in order to fine-tune the noise reduction features. Therefore, with implementation of Mitigation Measure 4.12.4, no significant noise impacts would occur at these Planning Areas.

Table 4.12.Q (located at the end of this section) provides a summary of the exterior noise impacts and mitigation for the affected Planning Areas in the Specific Plan. Table 4.12.R (located at the

end of this section) provides a summary of the interior noise impacts and mitigation for affected Planning Areas in the Specific Plan.

Stationary Sources. The Specific Plan includes three "villages" with a variety of land uses, including: residential, mixed-use, school, parks and recreation, and commercial. In general, machinery or other sources of exterior noise would not be placed in the proximity of residential or other sensitive uses such as parks. However, the Specific Plan would allow for police stations, fire stations, and schools to be placed within or in proximity to residential Planning Areas. Consistent with project design features, during final design, an acoustical study would be conducted to evaluate the need for upgraded building materials and/or sound walls for sensitive uses located in proximity to noise-generating stationary sources.

Threshold 4.12.2: Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels

Less than Significant Impact.

Construction Vibration. Ground-borne noise and vibration from construction activity would be mostly low to moderate except if pavement breaking or sheet pile vibration is used on site. Bulldozers and other heavy-tracked construction equipment generate approximately 92 VdB of ground-borne vibration when measured at 50 ft, based on *Transit Noise and Vibration Impact Assessment* (FTA 2006). This level of ground-borne vibration exceeds the threshold of human perception, which is around 65 VdB (FTA 2006). Based on Caltrans' Transportation Related Earthborne Vibration, Technical Advisory (Rudy Hendricks, July 24, 1992), vibration level at 100 ft is approximately 6 VdB lower than the vibration level at 50 ft. Vibration at 200 ft from the source is more than 6 VdB lower than the vibration level at 100 ft, or more than 12 VdB lower than the vibration level at 50 ft. Therefore, receptors at 100 ft and 200 ft from the construction activity may be exposed to ground-borne vibration up to 86 and 80 VdB, respectively, during site preparation for each of the five phases of the Specific Plan (site preparation is assumed to occur over 7 months, or approximately 5 percent of the total 136 months for the entire construction for each project phase [in a noise analysis, construction phases can overlap]). Although this range of ground-borne vibration levels would result in potential temporary annoyance at the nearest residences adjacent to the project site, it is not considered excessive, and it would not cause any damage to the buildings.[1] Therefore, construction vibration, similar to vibration from other sources, would not have any significant effects on outdoor activities.

Ground-Borne Noise and Vibration from Vehicular Traffic. Because the rubber tires and suspension systems of buses and other on-road vehicles provide vibration isolation and reduce noise, it is unusual for on-road vehicles to cause ground-borne noise or vibration problems. When

[1] With implementation of Mitigation Measure 4.12.1, no significant construction noise impacts would occur. A vibration level exceeding 85 VdB is acceptable only if there are an infrequent number of events per day. This level of vibration is higher than the 80 VdB that may cause human annoyance, but is lower than the 90 VdB vibration level that could potentially cause damage to buildings (FTA 2006). Exceeding this level of vibration is normally considered excessive from a human response point of view.

on-road vehicles cause effects such as rattling of windows, the source is almost always airborne noise. Most problems with on-road vehicle-related noise and vibration can be directly related to a pothole, bump, expansion joint, or other discontinuity in the road surface. Smoothing the bump or filling the pothole will usually solve the problem. The proposed project would have new roads with smooth pavement and would not result in significant ground-borne noise or vibration impacts from vehicular traffic.

Threshold 4.12.3: A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project

Less than Significant Impact with Mitigation. There would be an increase in traffic noise levels on several roadway segments in the project vicinity as a result of the proposed project. However, there are either no existing noise-sensitive land uses or no noise-sensitive outdoor living area that would be exposed to the traffic noise along these roads. Therefore, no significant off-site traffic noise impacts would occur as a result of the proposed project, and no mitigation measures would be required for off-site sensitive land uses. Mitigation Measures 4.12.2 and 4.12.3 have been identified for future proposed on-site uses that could be impacted by traffic noise to reduce this impact to less than significant levels. Sound walls are recommended to reduce the traffic noise levels in the outdoor active use areas to 60 dBA CNEL or lower to meet the City's exterior noise standard of 60 dBA CNEL. To achieve the interior noise level standard, building facade enhancements and mechanical ventilation (air conditioning) were identified to reduce the exterior noise inside the dwelling units to meet the 45 dBA CNEL interior noise standard. All measures specified are typically the minimum that would be required to meet these noise standards and therefore reduce noise to a level that is less than significant. With more building upgrades, the interior noise would be reduced even more; however, the associated cost would also be greater.

Threshold 4.12.4: A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project

Less than Significant Impact with Mitigation. As discussed above under Threshold 4.12.1, construction at the project site would temporarily increase ambient noise levels above existing levels without the project. The high noise levels that would occur during site preparation caused by earthmoving equipment for each of the Specific Plan phases would be short term because site preparation during each phase is assumed to last 7 months, or 5 percent of the total time required for construction. Other construction activities such as building erection would generate lower noise levels, and the majority of the construction activity would occur more than 100 ft from the nearest receptors. In addition, the proposed project would comply with the time periods for construction specified in the City's Municipal Code as listed in Mitigation Measure 4.12.1, which does not allow construction at nighttime. Mitigation Measure 4.12.1, Construction Noise, was designed to reduce the construction noise impacts. Compliance with the City's construction hours restrictions would reduce the construction noise impact to a less than significant level. Implementation of Mitigation Measure 4.12.1 would further reduce the construction noise exposure for receivers adjacent to the project site by requiring all construction equipment to be equipped with properly operating and maintained mufflers, placing all stationary equipment so that noise is directed away from noise-sensitive receptors and locating equipment staging areas to create the greatest distance between construction-related noise sources and noise-sensitive receptors. Therefore, the temporary increase in ambient

noise levels as a result of construction is not considered substantial and would be reduced to a less than significant level with mitigation incorporated.

Threshold 4.12.5: For a project located within 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

No Impact. As discussed further in Section 4.8, Hazards and Hazardous Materials, the project site is not located within an airport land use plan. The closest airport is Jacqueline Cochran Regional Airport (formerly known as Thermal Airport) and is located approximately 4 mi southwest of the project site. Therefore, the proposed project would not expose people residing or working in the area to excessive noise levels, and no mitigation is required.

Threshold 4.12.6: For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels

No Impact. As discussed previously, the project site is not located within the vicinity of a public or private airstrip. Therefore, the proposed project would not expose people residing or working in the project area to excessive noise levels, and no mitigation is required.

4.12.9 Mitigation Measures

Mitigation Measure 4.12.1 **Construction Noise.** During construction activities, the Construction Contractor shall implement the following standard noise reduction measures and shall adhere to the City of Coachella's (City) construction noise hours indicated in the City's Municipal Code Sub-Chapter 7.04.070, Construction Activities, as listed below:

- The construction contractor shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers consistent with manufacturers' standards.
- The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from sensitive receptors to the west of the site.
- The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and noise-sensitive receptors to the west of the site during all project construction.
- All construction, maintenance, or demolition activities within the City boundary shall be limited to the following hours:

October 1 through April 30
Monday–Friday: 6:00 a.m. to 5:30 p.m.
Saturday: 8:00 a.m. to 5:00 p.m.
Sunday: 8:00 a.m. to 5:00 p.m.
Holidays: 8:00 a.m. to 5:00 p.m.

May 1 through September 30
Monday–Friday: 5:00 a.m. to 7:00 p.m.
Saturday: 8:00 a.m. to 5:00 p.m.
Sunday: 8:00 a.m. to 5:00 p.m.
Holidays: 8:00 a.m. to 5:00 p.m.

Mitigation Measure 4.12.2 **Noise Reduction at Planning Areas G12, G9, G10, and G11 Along Avenue 50.** The project proponent shall conduct site-specific noise analyses for sensitive receptors within Planning Areas G12, G9, G10, and G11 along Avenue 50 for review and approval by the City of Coachella prior to approval of the Tentative Tract Map. The purpose of these analyses will be to confirm the applicability of the following building upgrades for each structure, as well as the location/height of sound walls:

- Areas exceeding 70 A-weighted decibels (dBA) Community Noise Equivalent Level (CNEL) (within 58 feet [ft] from centerline of Avenue 50): 8 ft sound wall for ground level outdoor areas and 5 ft sound wall for upper floor outdoor areas;
- Areas exceeding 65 dBA CNEL (within 120 ft from centerline of Avenue 50): 6 ft sound wall for ground level outdoor areas and 5 ft sound wall for upper floor areas;
- Areas exceeding 60 dBA CNEL (within 256 ft from centerline of Avenue 50): 5 ft sound wall for both ground floor and upper floor outdoor areas;
- Structures that would be exposed to exterior noise exceeding 69 dBA CNEL (within 68 ft of Avenue 50 centerline) would require upgrades, such as windows with sound transmission class (STC) ratings of STC-28 or higher; and
- Air-conditioning systems are required for residential structures directly adjacent to Avenue 50.

Mitigation Measure 4.12.3 **Noise Reduction at Planning Areas G6 and G7 Along Avenue 50.** The project proponent shall conduct site-specific noise analyses for sensitive receptors within Planning Areas G6 and G7 along Avenue 50 for review and approval by the City of Coachella (City) prior to approval of the Tentative Tract Map. The purpose of these analyses will be to confirm the applicability of the following building upgrades for each structure, as well as the location/height of sound walls:

- Areas exceeding 70 dBA CNEL (within 54 ft from centerline of Avenue 50): 8 ft sound wall for ground level outdoor areas and 5 ft sound wall for upper floor outdoor areas;
- Areas exceeding 65 dBA CNEL (within 110 ft from centerline of Avenue 50): 6 ft sound wall for ground level outdoor areas and 5 ft sound wall for upper floor areas;
- Areas exceeding 60 dBA CNEL (within 235 ft from centerline of Avenue 50): 5 ft sound wall for both ground floor and upper floor outdoor areas;
- Structures that would be exposed to exterior noise exceeding 69 dBA CNEL (within 63 ft of Avenue 50 centerline) would require upgrades, such as windows with STC 28 or higher; and
- Air-conditioning systems are required for residential structures directly adjacent to Avenue 50.

Mitigation Measure 4.12.4 **Noise Reduction at Planning Areas G5, G8, G19, and G20 Along I-10.** The project proponent shall conduct site-specific noise analyses for sensitive receptors within Planning Areas G5, G8, G19, and G20 along I-10 for review and approval by the City of Coachella prior to approval of the Tentative Tract Map. The purpose of these analyses will be to confirm the applicability of the following building upgrades for each structure, as well as the location/height of sound walls:

- Areas exceeding 70 dBA CNEL (within 619 ft from centerline of Interstate 10 [I-10]): 8 ft sound wall for ground level outdoor areas and 5 ft sound wall for upper floor outdoor areas;
- Areas exceeding 65 dBA CNEL (within 1,333 ft from centerline of I-10): 6 ft sound wall for ground level outdoor areas and 5 ft sound wall for upper floor areas;
- Areas exceeding 60 dBA CNEL (within 2,871 ft from centerline of I-10): 5 ft sound wall for both ground floor and upper floor outdoor areas;
- Structures that would be exposed to exterior noise exceeding 69 dBA CNEL (within 722 ft of I-10 centerline) would require upgrades, such as windows with STC 28 or higher; and
- Air-conditioning systems are required for residential structures directly adjacent to I-10.

4.12.10 Cumulative Impacts

For the proposed project, cumulative impacts are the incremental effects of the proposed project when viewed in connection with the effects of past, current, and potential future projects within the cumulative impact area of the City of Coachella. As discussed in this section, by its nature, noise decreases rapidly with distance, and no cumulative projects were identified in the immediate vicinity.

The cumulative study area for traffic noise is the proposed project's traffic study area. The Traffic Study conducted a cumulative analysis for the existing plus project, 2020, 2030, and 2035 with and without project conditions, with and without the I-10 Interchange, and the traffic noise impacts are based on that analysis. Therefore, the traffic noise analysis presented in this section is a cumulative impact analysis.

Construction-related noise impacts would be mitigated through compliance with standard noise reductions and adherence to the City's specified construction hours. Potential noise generated by the project components during operation such as machinery associated with commercial facilities would be managed through implantation of project design features that comply with City noise standards. Since every project within the City's limits is required to comply with the Municipal Code Chapter 7.04 noise control ordinance requirements, including the construction hours restrictions, the proposed project design features would ensure that project-related construction activities comply with these requirements and therefore would reduce the potential construction noise impacts to a less than significant level. The following three Project Design Features (PDFs) are related to construction:

- The Specific Plan is proposed to be developed in phases, which include five mass grading phases and five development phases. The initial Phase 1 grading would be limited to the area necessary to achieve a balanced site and proper drainage, thereby reducing the noise impacts associated with mass grading during the interim implementation phase. As stated previously, in noise analysis, construction phasing can overlap. With implementation of Mitigation Measure 4.12.1, no significant construction noise impacts would occur.
- The Specific Plan has been designed to retain the northern steeper slopes in natural open space, thereby reducing grading noise.
- The Specific Plan will be constructed in compliance with all applicable provisions in the City's Municipal Code, including observing all time limitations on construction noise that exceeds the base ambient noise levels pursuant to statute.

Sound walls are recommended to reduce the traffic noise levels in the outdoor active use areas to 60 dBA CNEL or lower to meet the City's exterior noise standard of 60 dBA CNEL. To achieve the interior noise level standard, building facade enhancements and mechanical ventilation (air conditioning) were identified to reduce the exterior noise inside the dwelling units to meet the 45 dBA CNEL interior noise standard. All measures specified are typically the minimum that would be required to meet these noise standards and therefore reduce noise to a level that is less than significant. With more building upgrades, the interior noise would be reduced even more; however, the associated cost would also be greater.

Therefore, the proposed project's contribution to cumulative noise impacts would be considered less than significant.

4.12.11 Significant Unavoidable Adverse Impacts

The proposed project would not result in significant unavoidable adverse noise impacts with implementation of Mitigation Measures 4.12.1 through 4.12.4.

Table 4.12.H: Existing With Project Phases 1–4 Traffic Noise Levels

Roadway Segment	ADT	Centerline to 70 CNEL (ft)	Centerline to 65 CNEL (ft)	Centerline to 60 CNEL (ft)	CNEL (dBA) 50 ft from Centerline of Outermost Lane	Increase CNEL (dBA) 50 ft from Centerline of Outermost Lane
Avenue 50 between Tyler St. and Polk St. (Secondary)	17,200	69	146	312	70.2	16.7
Avenue 50 between Polk St. and Fillmore St. (Secondary)	17,800	71	149	319	70.3	18.8
Avenue 50 between Fillmore St. and Street C (Secondary)	7,400	< 50	84	178	66.5	25.5
Avenue 50 between Street C and Street A (Secondary)	8,800	< 50	94	200	67.2	N/A
Fillmore St. between Avenue 50 and Avenue 52 (Arterial)	530	< 50	< 50	< 50	52.2	2.3
Fillmore St. between Avenue 52 and Avenue 53 (Arterial)	3,100	< 50	< 50	55	59.9	6.1
Fillmore St. between Avenue 53 and Airport Blvd. (Arterial)	2,200	< 50	< 50	< 50	58.4	4.9
Fillmore St. south of Airport Blvd. (Arterial)	830	< 50	< 50	< 50	54.1	0.0
Avenue 52 between Fillmore St. and Pierce St. (Arterial)	14,600	< 50	71	153	66.6	25.6
Avenue 53 between Fillmore St. and Pierce St. (Arterial)	250	< 50	< 50	< 50	48.9	3.1
Pierce St. between Avenue 52 and Avenue 53 (Arterial)	980	< 50	< 50	< 50	54.9	16.9
Pierce St. between Avenue 53 and Avenue 54 (Arterial)	930	< 50	< 50	< 50	54.6	9.6
Pierce St. between Avenue 54 and Airport Blvd. (Arterial)	910	< 50	< 50	< 50	54.5	7.0
I-10 Freeway	29,100	421	907	1,952	81.7	0.0

Source: *Noise Impact Analysis*, LSA Associates, Inc. (June 2013).
Note: Traffic noise within 50 ft of the roadway centerline should be evaluated with site-specific information.
N/A = No comparison possible because road segment does not exist.
ADT = average daily traffic
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels
ft = feet
I-10 = Interstate 10

Table 4.12.I: Existing With Project Phases 1–5 Without I-10 Interchange Traffic Noise Levels

Roadway Segment	ADT	Centerline to 70 CNEL (ft)	Centerline to 65 CNEL (ft)	Centerline to 60 CNEL (ft)	CNEL (dBA) 50 ft from Centerline of Outermost Lane	Increase CNEL (dBA) 50 ft from Centerline of Outermost Lane
Avenue 50 between Tyler St. and Polk St. (Secondary)	43,400	126	269	578	74.2	20.7
Avenue 50 between Polk St. and Fillmore St. (Secondary)	43,400	126	269	578	74.2	22.7
Avenue 50 between Fillmore St. and Street C (Secondary)	10,400	< 50	105	223	68.0	27.0
Avenue 50 between Street C and Street A (Secondary)	7,700	< 50	87	183	66.7	N/A
Avenue 50 between Street A and I-10 Eastbound Ramp (Secondary)	10,300	< 50	104	222	67.9	N/A
Fillmore St. between Avenue 50 and Avenue 52 (Arterial)	3,100	< 50	< 50	55	59.9	10.0
Fillmore St. between Avenue 52 and Avenue 53 (Arterial)	3,200	< 50	< 50	56	60.0	6.2
Fillmore St. between Avenue 53 and Airport Blvd. (Arterial)	2,400	< 50	< 50	< 50	58.8	5.3
Fillmore St. south of Airport Blvd. (Arterial)	830	< 50	< 50	< 50	54.1	0.0
Avenue 52 between Fillmore St. and Pierce St. (Arterial)	20,800	< 50	90	194	68.1	27.1
Avenue 53 between Fillmore St. and Pierce St. (Arterial)	120	< 50	< 50	< 50	45.8	0.0
Pierce St. between Avenue 52 and Avenue 53 (Arterial)	830	< 50	< 50	< 50	54.1	16.1
Pierce St. between Avenue 53 and Avenue 54 (Arterial)	780	< 50	< 50	< 50	53.9	8.9
Pierce St. between Avenue 54 and Airport Blvd. (Arterial)	690	< 50	< 50	< 50	53.3	5.8
I-10 Freeway	31,600	445	958	2,063	82.0	0.3

Source: *Noise Impact Analysis*, LSA Associates, Inc. (June 2013).
Note: Traffic noise within 50 ft of the roadway centerline should be evaluated with site-specific information.
N/A = No comparison possible because road segment does not exist.
ADT = average daily traffic
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels
ft = feet
I-10 = Interstate 10

Table 4.12.J: Existing With Project Phases 1–5 With I-10 Interchange Traffic Noise Levels

Roadway Segment	ADT	Centerline to 70 CNEL (ft)	Centerline to 65 CNEL (ft)	Centerline to 60 CNEL (ft)	CNEL (dBA) 50 ft from Centerline of Outermost Lane	Increase CNEL (dBA) 50 ft from Centerline of Outermost Lane
Avenue 50 between Tyler St. and Polk St. (Secondary)	11,100	53	109	233	68.3	14.8
Avenue 50 between Polk St. and Fillmore St. (Secondary)	13,400	60	124	264	69.1	17.6
Avenue 50 between Fillmore St. and Street C (Secondary)	6,100	< 50	75	157	65.7	24.7
Avenue 50 between Street C and Street A (Secondary)	9,100	< 50	96	205	67.4	N/A
Avenue 50 between Street A and I-10 Eastbound Ramp (Secondary)	22,800	83	175	376	71.4	N/A
Fillmore St. between Avenue 50 and Avenue 52 (Arterial)	3,100	< 50	< 50	55	59.9	10.0
Fillmore St. between Avenue 52 and Avenue 53 (Arterial)	3,200	< 50	< 50	56	60.0	6.2
Fillmore St. between Avenue 53 and Airport Blvd. (Arterial)	2,400	< 50	< 50	< 50	58.8	5.3
Fillmore St. south of Airport Blvd. (Arterial)	830	< 50	< 50	< 50	54.1	0.0
Avenue 52 between Fillmore St. and Pierce St. (Arterial)	12,200	< 50	63	136	65.8	24.8
Avenue 53 between Fillmore St. and Pierce St. (Arterial)	120	< 50	< 50	< 50	45.8	0.0
Pierce St. between Avenue 52 and Avenue 53 (Arterial)	830	< 50	< 50	< 50	54.1	16.1
Pierce St. between Avenue 53 and Avenue 54 (Arterial)	780	< 50	< 50	< 50	53.9	8.9
Pierce St. between Avenue 54 and Airport Blvd. (Arterial)	690	< 50	< 50	< 50	53.3	5.8
I-10 Freeway	37,700	501	1,077	2,320	82.8	1.1

Source: *Noise Impact Analysis*, LSA Associates, Inc. (June 2013).
Note: Traffic noise within 50 ft of the roadway centerline should be evaluated with site-specific information.
N/A = No comparison possible because road segment does not exist.
ADT = average daily traffic
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels
ft = feet
I-10 = Interstate 10

Table 4.12.K: 2020 Without Project Traffic Noise Levels

Roadway Segment	ADT	Centerline to 70 CNEL (ft)	Centerline to 65 CNEL (ft)	Centerline to 60 CNEL (ft)	CNEL (dBA) 50 ft from Centerline of Outermost Lane
Avenue 50 between Tyler St. and Polk St. (Secondary)	10,800	< 50	108	229	68.1
Avenue 50 between Polk St. and Fillmore St. (Secondary)	11,200	54	110	235	68.3
Avenue 50 between Fillmore St. and Street C (Secondary)	1,700	< 50	< 50	69	60.1
Avenue 50 between Street C and Street A (Secondary)	1,700	< 50	< 50	69	60.1
Avenue 50 between Street A and I-10 Eastbound Ramp (Secondary)	1,400	< 50	< 50	61	59.3
Fillmore St. between Avenue 50 and Avenue 52 (Arterial)	7,700	< 50	< 50	100	63.8
Fillmore St. between Avenue 52 and Avenue 53 (Arterial)	5,400	< 50	< 50	79	62.3
Fillmore St. between Avenue 53 and Airport Blvd. (Arterial)	4,300	< 50	< 50	68	61.3
Fillmore St. south of Airport Blvd. (Arterial)	4,200	< 50	< 50	67	61.2
Avenue 52 between Fillmore St. and Pierce St. (Arterial)	3,700	< 50	< 50	62	60.6
Avenue 53 between Fillmore St. and Pierce St. (Arterial)	1,200	< 50	< 50	< 50	55.8
Pierce St. between Avenue 52 and Avenue 53 (Arterial)	6,400	< 50	< 50	89	63.0
Pierce St. between Avenue 53 and Avenue 54 (Arterial)	6,700	< 50	< 50	91	63.2
Pierce St. between Avenue 54 and Airport Blvd. (Arterial)	6,500	< 50	< 50	90	63.1
I-10 Freeway	35,900	485	1,043	2,246	82.6

Source: *Noise Impact Analysis*, LSA Associates, Inc. (June 2013).
Note: Traffic noise within 50 ft of the roadway centerline should be evaluated with site-specific information.
ADT = average daily traffic
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels
ft = feet
I-10 = Interstate 10

Table 4.12.L: 2020 With Project Phases 1–2 Traffic Noise Levels

Roadway Segment	ADT	Centerline to 70 CNEL (ft)	Centerline to 65 CNEL (ft)	Centerline to 60 CNEL (ft)	CNEL (dBA) 50 ft from Centerline of Outermost Lane	Increase CNEL (dBA) 50 ft from Centerline of Outermost Lane
Avenue 50 between Tyler St. and Polk St. (Secondary)	22,800	83	175	376	71.4	3.3
Avenue 50 between Polk St. and Fillmore St. (Secondary)	23,800	85	180	387	71.6	3.3
Avenue 50 between Fillmore St. and Street C (Secondary)	5,000	< 50	66	138	64.8	4.7
Avenue 50 between Street C and Street A (Secondary)	8,100	< 50	89	189	66.9	6.8
Avenue 50 between Street A and I-10 Eastbound Ramp (Secondary)	1,400	< 50	< 50	61	59.3	0.0
Fillmore St. between Avenue 50 and Avenue 52 (Arterial)	7,800	< 50	< 50	101	63.9	0.1
Fillmore St. between Avenue 52 and Avenue 53 (Arterial)	6,400	< 50	< 50	89	63.0	0.7
Fillmore St. between Avenue 53 and Airport Blvd. (Arterial)	4,900	< 50	< 50	74	61.9	0.6
Fillmore St. south of Airport Blvd. (Arterial)	4,200	< 50	< 50	67	61.2	0.0
Avenue 52 between Fillmore St. and Pierce St. (Arterial)	10,400	< 50	57	122	65.1	4.5
Avenue 53 between Fillmore St. and Pierce St. (Arterial)	1,200	< 50	< 50	< 50	55.8	0.0
Pierce St. between Avenue 52 and Avenue 53 (Arterial)	7,000	< 50	< 50	94	63.4	0.4
Pierce St. between Avenue 53 and Avenue 54 (Arterial)	7,300	< 50	< 50	97	63.6	0.4
Pierce St. between Avenue 54 and Airport Blvd. (Arterial)	6,900	< 50	< 50	93	63.3	0.2
I-10 Freeway	35,900	485	1,043	2,246	82.6	0.0

Source: *Noise Impact Analysis*, LSA Associates, Inc. (June 2013).
Note: Traffic noise within 50 ft of the roadway centerline should be evaluated with site-specific information. ADT = average daily traffic
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels
ft = feet
I-10 = Interstate 10

Table 4.12.M: 2030 Without Project Traffic Noise Levels

Roadway Segment	ADT	Centerline to 70 CNEL (ft)	Centerline to 65 CNEL (ft)	Centerline to 60 CNEL (ft)	CNEL (dBA) 50 ft from Centerline of Outermost Lane
Avenue 50 between Tyler St. and Polk St. (Secondary)	25,200	88	187	402	71.8
Avenue 50 between Polk St. and Fillmore St. (Secondary)	26,500	91	194	416	72.0
Avenue 50 between Fillmore St. and Street C (Secondary)	3,900	< 50	57	117	63.7
Avenue 50 between Street C and Street A (Secondary)	4,000	< 50	58	119	63.8
Avenue 50 between Street A and I-10 Eastbound Ramp (Secondary)	3,200	< 50	< 50	103	62.9
Fillmore St. between Avenue 50 and Avenue 52 (Arterial)	18,200	< 50	83	178	67.6
Fillmore St. between Avenue 52 and Avenue 53 (Arterial)	11,900	< 50	62	134	65.7
Fillmore St. between Avenue 53 and Airport Blvd. (Arterial)	9,400	< 50	53	114	64.7
Fillmore St. south of Airport Blvd. (Arterial)	8,900	< 50	52	110	64.5
Avenue 52 between Fillmore St. and Pierce St. (Arterial)	8,700	< 50	51	109	64.4
Avenue 53 between Fillmore St. and Pierce St. (Arterial)	2,600	< 50	< 50	< 50	59.1
Pierce St. between Avenue 52 and Avenue 53 (Arterial)	15,400	< 50	74	159	66.8
Pierce St. between Avenue 53 and Avenue 54 (Arterial)	16,100	< 50	76	164	67.0
Pierce St. between Avenue 54 and Airport Blvd. (Arterial)	15,400	< 50	74	159	66.8
I-10 Freeway	45,600	568	1,223	2,634	83.6

Source: *Noise Impact Analysis*, LSA Associates, Inc. (June 2013).
Note: Traffic noise within 50 ft of the roadway centerline should be evaluated with site-specific information.
ADT = average daily traffic
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels
ft = feet
I-10 = Interstate 10

Table 4.12.N: 2030 With Project Phases 1–4 Traffic Noise Levels

Roadway Segment	ADT	Centerline to 70 CNEL (ft)	Centerline to 65 CNEL (ft)	Centerline to 60 CNEL (ft)	CNEL (dBA) 50 ft from Centerline of Outermost Lane	Increase CNEL (dBA) 50 ft from Centerline of Outermost Lane
Avenue 50 between Tyler St. and Polk St. (Secondary)	41,600	122	261	561	74.0	2.2
Avenue 50 between Polk St. and Fillmore St. (Secondary)	43,800	126	270	581	74.2	2.2
Avenue 50 between Fillmore St. and Street C (Secondary)	11,200	54	110	235	68.3	4.6
Avenue 50 between Street C and Street A (Secondary)	12,800	58	120	256	68.9	5.1
Avenue 50 between Street A and I-10 Eastbound Ramp (Secondary)	3,200	< 50	< 50	103	62.9	0.0
Fillmore St. between Avenue 50 and Avenue 52 (Arterial)	18,500	< 50	84	180	67.6	0.0
Fillmore St. between Avenue 52 and Avenue 53 (Arterial)	14,200	< 50	70	151	66.5	0.8
Fillmore St. between Avenue 53 and Airport Blvd. (Arterial)	10,900	< 50	59	126	65.3	0.6
Fillmore St. south of Airport Blvd. (Arterial)	8,900	< 50	52	110	64.5	0.0
Avenue 52 between Fillmore St. and Pierce St. (Arterial)	23,300	< 50	97	209	68.6	4.2
Avenue 53 between Fillmore St. and Pierce St. (Arterial)	2,700	< 50	< 50	< 50	59.3	0.2
Pierce St. between Avenue 52 and Avenue 53 (Arterial)	16,300	< 50	77	165	67.1	0.3
Pierce St. between Avenue 53 and Avenue 54 (Arterial)	16,900	< 50	79	169	67.2	0.2
Pierce St. between Avenue 54 and Airport Blvd. (Arterial)	16,100	< 50	76	164	67.0	0.2
I-10 Freeway	45,700	569	1,225	2,638	83.6	0.0

Source: *Noise Impact Analysis*, LSA Associates, Inc. (June 2013).
Note: Traffic noise within 50 ft of the roadway centerline should be evaluated with site-specific information.
ADT = average daily traffic
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels
ft = feet
I-10 = Interstate 10

Table 4.12.O: 2035 General Plan Build Out Without Project Traffic Noise Levels

Roadway Segment	ADT	Centerline to 70 CNEL (ft)	Centerline to 65 CNEL (ft)	Centerline to 60 CNEL (ft)	CNEL (dBA) 50 ft from Centerline of Outermost Lane
Avenue 50 between Tyler St. and Polk St. (Secondary)	33,800	107	228	489	73.1
Avenue 50 between Polk St. and Fillmore St. (Secondary)	19,000	74	156	333	70.6
Avenue 50 between Fillmore St. and Street C (Secondary)	3,200	< 50	< 50	103	62.9
Avenue 50 between Street C and Street A (Secondary)	2,000	< 50	< 50	76	60.8
Avenue 50 between Street A and I-10 Eastbound Ramp (Secondary)	11,200	54	110	235	68.3
Fillmore St. between Avenue 50 and Avenue 52 (Arterial)	33,300	58	123	266	70.2
Fillmore St. between Avenue 52 and Avenue 53 (Arterial)	17,200	< 50	80	171	67.3
Fillmore St. between Avenue 53 and Airport Blvd. (Arterial)	12,300	< 50	64	137	65.9
Fillmore St. south of Airport Blvd. (Arterial)	12,000	< 50	63	135	65.8
Avenue 52 between Fillmore St. and Pierce St. (Arterial)	7,300	< 50	< 50	97	63.6
Avenue 53 between Fillmore St. and Pierce St. (Arterial)	4,500	< 50	< 50	70	61.5
Pierce St. between Avenue 52 and Avenue 53 (Arterial)	17,500	< 50	81	173	67.4
Pierce St. between Avenue 53 and Avenue 54 (Arterial)	18,400	< 50	83	179	67.6
Pierce St. between Avenue 54 and Airport Blvd. (Arterial)	17,300	< 50	80	172	67.3
I-10 Freeway	45,300	566	1,218	2,622	83.6

Source: *Noise Impact Analysis*, LSA Associates, Inc. (June 2013).
Note: Traffic noise within 50 ft of the roadway centerline should be evaluated with site-specific information.
ADT = average daily traffic
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels
ft = feet
I-10 = Interstate 10

Table 4.12.P: 2035 General Plan Build Out With Project Build Out Traffic Noise Levels

Roadway Segment	ADT	Centerline to 70 CNEL (ft)	Centerline to 65 CNEL (ft)	Centerline to 60 CNEL (ft)	CNEL (dBA) 50 ft from Centerline of Outermost Lane	Increase CNEL (dBA) 50 ft from Centerline of Outermost Lane
Avenue 50 between Tyler St. and Polk St. (Secondary)	40,000	119	254	547	73.8	0.7
Avenue 50 between Polk St. and Fillmore St. (Secondary)	31,000	101	215	462	72.7	2.1
Avenue 50 between Fillmore St. and Street C (Secondary)	9,100	< 50	96	205	67.4	4.5
Avenue 50 between Street C and Street A (Secondary)	12,400	57	118	251	68.7	7.9
Avenue 50 between Street A and I-10 Eastbound Ramp (Secondary)	30,000	99	210	452	72.6	4.3
Fillmore St. between Avenue 50 and Avenue 52 (Arterial)	37,300	62	133	287	70.7	0.5
Fillmore St. between Avenue 52 and Avenue 53 (Arterial)	18,000	< 50	82	176	67.5	0.2
Fillmore St. between Avenue 53 and Airport Blvd. (Arterial)	12,800	< 50	65	141	66.0	0.1
Fillmore St. south of Airport Blvd. (Arterial)	12,000	< 50	63	135	65.8	0.0
Avenue 52 between Fillmore St. and Pierce St. (Arterial)	19,200	< 50	86	184	67.8	4.2
Avenue 53 between Fillmore St. and Pierce St. (Arterial)	4,600	< 50	< 50	71	61.6	0.1
Pierce St. between Avenue 52 and Avenue 53 (Arterial)	21,500	< 50	92	199	68.3	0.9
Pierce St. between Avenue 53 and Avenue 54 (Arterial)	22,100	< 50	94	202	68.4	0.8
Pierce St. between Avenue 54 and Airport Blvd. (Arterial)	19,100	< 50	85	183	67.8	0.5
I-10 Freeway	51,900	619	1,333	2,871	84.2	0.6

Source: *Noise Impact Analysis*, LSA Associates, Inc. (June 2013).
Note: Traffic noise within 50 ft of the roadway centerline should be evaluated with site-specific information.
ADT = average daily traffic
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels
ft = feet
I-10 = Interstate 10

Table 4.12.Q: Exterior Noise Impacts and Mitigation for Affected Planning Areas

Planning Area	Exceeds Exterior Noise Standard?	Mitigation (Mitigation Measures 4.12.2, 4.12.3, and 4.12.4)	Less than Significant Impact with Mitigation?
Adjacent to Avenue 50: G12 (Medium Density Residential) and G12, G9, G10, and G11(Mixed Use) Residential units and parks			
Within 58 ft from centerline of Avenue 50 (exposed to exterior noise exceeding 70 dBA CNEL)	Yes	8 ft high sound wall for ground-level outdoor areas 5 ft high sound wall for upper-floor outdoor areas	Yes
Within 120 ft from centerline of Avenue 50 (exposed to exterior noise exceeding 65 dBA CNEL)	Yes	6 ft high sound wall for ground-level outdoor areas 5 ft high sound wall for upper-floor outdoor areas	Yes
Within 256 ft from centerline of Avenue 50 (exposed to exterior noise exceeding 60 dBA CNEL)	Yes	5 ft high sound wall for both ground-floor and upper-floor outdoor areas.	Yes
Adjacent to Avenue 50: G6 and G7 (Mixed Use)			
Within 54 ft from centerline of Avenue 50 (exposed to exterior noise exceeding 70 dBA CNEL)	Yes	8 ft high sound wall for ground-level outdoor areas 5 ft high sound wall for upper-floor outdoor areas	Yes
Within 110 ft from centerline of Avenue 50 (exposed to exterior noise exceeding 65 dBA CNEL)	Yes	6 ft high sound wall for ground-level outdoor areas 5 ft high sound wall for upper-floor outdoor areas	Yes
Within 235 ft from centerline of Avenue 50 (exposed to exterior noise exceeding 60 dBA CNEL)	Yes	5 ft high sound wall for both ground-floor and upper-floor outdoor areas.	Yes
Adjacent to I-10: G5 (High Density Residential), G8 (High Density Residential), G19 (Medium Density Residential), and G20 (Low Density Residential)			
Within 619 ft from centerline of I-10 (exposed to exterior noise exceeding 70 dBA CNEL)	Yes	8 ft high sound wall for ground-level outdoor areas 5 ft high sound wall for upper-floor outdoor areas	Yes
Within 1,333 ft from centerline of I-10 (exposed to exterior noise exceeding 65 dBA CNEL)	Yes	6 ft high sound wall for ground-level outdoor areas 5 ft high sound wall for upper-floor outdoor areas	Yes
Within 2,871 ft from centerline of I-10 (exposed to exterior noise exceeding 60 dBA CNEL)	Yes	5 ft high sound wall for both ground-floor and upper-floor outdoor areas.	Yes

CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels
ft = feet
I-10 = Interstate 10

Table 4.12.R: Interior Noise Impacts and Mitigation for Affected Planning Areas

Planning Area	Exceeds Interior Noise Standard?	Mitigation (Mitigation Measures 4.12.2, 4.12.3, and 4.12.4)	Less than Significant Impact with Mitigation?
Adjacent to Avenue 50: G12 (Medium Density Residential) and G12, G9, G10, and G11(Mixed Use) Residential units and parks			
Within 68 ft from Avenue 50 centerline (exposed to exterior noise exceeding 69 dBA CNEL)	Yes	Windows with Sound Transmission Class ratings of STC-28 or higher Air-conditioning units for residential units directly adjacent to Avenue 50	Yes
Adjacent to Avenue 50: G6 and G7 (Mixed Use)			
Within 63 ft from Avenue 50 centerline (exposed to exterior noise exceeding 69 dBA CNEL)	Yes	Windows with Sound Transmission Class ratings of STC-28 or higher Air-conditioning units for residential units directly adjacent to Avenue 50	Yes
Adjacent to I-10: G5 (High Density Residential), G8 (High Density Residential), G19 (Medium Density Residential), and G20 (Low Density Residential)			
Within 722 ft from I-10 centerline (exposed to exterior noise exceeding 69 dBA CNEL)	Yes	Windows with Sound Transmission Class ratings of STC-28 or higher Air-conditioning units for residential units directly adjacent to Avenue 50	Yes

CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels
ft = feet
I-10 = Interstate 10
STC = sound transmission class; an STC rating is a single number rating used to compare the sound insulation properties of walls, floors, ceilings, windows, or doors. The sound transmission class is derived from measurements in 16 test frequency bands.