4.13 Noise

This section analyzes the noise impacts that could result from implementation of the project, which consists of the 2021 General Plan Update (GPU), Housing Element Update, and Climate Action Plan (CAP). The analysis area covers the city of Moreno Valley (city) and sphere of influence, which are collectively referred to as the Planning Area. The analysis in this section is based on the existing and proposed land use patterns, existing and buildout traffic volumes on Planning Area freeways and roadways, and vehicle miles traveled (VMT) documented in the Moreno Valley General Plan Circulation Element Vehicle Miles Traveled Impact Assessment Memorandum (Fehr & Peers 2021). Noise measurement and modeling data is provided in Appendix D.

4.13.1 Existing Conditions

The Planning Area is subject to typical urban noises such as noise generated by traffic, heavy machinery, and day-to-day outdoor activities. The Planning Area also has several transportation-related noise sources, including airport noise, railroad operations, major arterials, Interstate 215 (I-215), and State Route 60 (SR-60). Noise sources that are not directly related to transportation include noise from commercial and industrial centers, construction, and property maintenance activities.

4.13.1.1 Fundamentals of Noise and Vibration

a. Fundamentals of Noise

Sound levels are described in units called the decibel (dB). Decibels are measured on a logarithmic scale that quantifies sound intensity in a manner similar to the Richter scale used for earthquake magnitudes. Thus, a doubling of the energy of a noise source, such as doubling of traffic volume, would increase the noise level by 3 dB; a halving of the energy would result in a 3 dB decrease.

Additionally, in technical terms, sound levels are described as either a “sound power level” or a “sound pressure level,” which while often confused, are two distinct characteristics of sound. Both share the same unit of measure, the dB. However, sound power, expressed as L_{pw}, is the energy converted into sound by the source. The L_{pw} is used to estimate how far a noise will travel and to predict the sound levels at various distances from the source. As sound energy travels through the air, it creates a sound wave that exerts pressure on receivers such as an ear drum or microphone and is the sound pressure level. Noise measurement instruments only measure sound pressure, and noise level limits used in standards are generally sound pressure levels.

The human ear is not equally sensitive to all frequencies within the sound spectrum. To accommodate this phenomenon, the A-scale, which approximates the frequency response of the average young ear when listening to most ordinary everyday sounds, was devised. When people make relative judgments of the loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. Therefore, the "A-weighted" noise scale is used for measurements and standards involving the human perception of noise. Noise levels using A-weighted measurements are designated with the notation dB(A).

The impact of noise is not a function of loudness alone. The time of day when noise occurs and the duration of the noise are also important. Additionally, most noise that lasts for more than a few seconds is variable in its intensity. Consequently, a variety of noise descriptors has been developed. The noise descriptors used for this study are the one-hour equivalent noise level (L_{eq}) and the community noise equivalent level (CNEL). The CNEL is a 24-hour equivalent sound level. The CNEL calculation applies a 5 dB(A) penalty to noise occurring during evening hours, between 7:00 p.m. and 10:00 p.m., and a 10 dB(A) penalty is added to noise occurring during the night, between 10:00 p.m. and 7:00 a.m. These increases for certain times are intended to account for the added sensitivity of humans to noise during the evening and night.

Sound from a small, localized source (approximating a "point" source) radiates uniformly outward as it travels away from the source in a spherical pattern, known as geometric spreading. The sound level decreases or drops off at a rate of 6 dB(A) for each doubling of the distance.

Traffic noise is not a single, stationary point source of sound. The movement of vehicles makes the source of the sound appear to emanate from a line (line source) rather than a point when viewed over some time interval. The drop-off rate for a line source is 3 dB(A) for each doubling of distance.

The propagation of noise is also affected by the intervening ground, known as ground absorption. A hard site (such as parking lots or smooth bodies of water) receives no additional ground attenuation, and the changes in noise levels with distance (drop-off rate) are simply the geometric spreading of the source. A soft site (such as soft dirt, grass, or scattered bushes and trees) receives an additional ground attenuation value of 1.5 dB(A) per doubling of distance. Thus, a point source over a soft site would attenuate at 7.5 dB(A) per doubling of distance.

Human perception of noise has no simple correlation with acoustical energy. A change in noise levels is generally perceived as follows: 3 dB(A) barely perceptible, 5 dB(A) readily perceptible, and 10 dB(A) perceived as a doubling or halving of noise (California Department of Transportation [Caltrans] 2013).

b. Fundamentals of Vibration

Vibration consists of energy waves transmitted through solid material (Federal Transit Administration [FTA] 2018). Groundborne vibration propagates from the source through the ground to adjacent buildings by surface waves. Vibration may be composed of a single pulse,

a series of pulses, or a continuous oscillatory motion. The frequency of a vibrating object describes how rapidly it is oscillating, measured in hertz (Hz). The normal frequency range of most groundborne vibration that can be felt generally starts from a low frequency of less than 1 Hz to a high of about 200 Hz (FTA 2018).

Groundborne vibration is measured by its peak particle velocity (PPV), which is normally described in inches per second (in/sec). PPV is appropriate for determining potential structure damage but does not evaluate human response to vibration. The ground motion caused by vibration may also be described in decibel notation (vibration decibels), referenced as VdB, which serves to compress the range of numbers required to describe vibration relative to human response. The general human response to different levels of groundborne vibration velocity levels is described in Table 4.13-1.

Table 4.13-1
Human Response to Different Levels of Groundborne Vibration

Vibration Velocity Level	Human Reaction
65 VdB	Approximate threshold of perception for many people.
75 VdB	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find that transportation-related vibration at this level is unacceptable.
85 VdB	Vibration acceptable only if there are an infrequent number of events per day.

SOURCE: FTA 2018.
VdB = vibration decibel

Vibration energy spreads out as it travels through the ground, causing the vibration amplitude to decrease with distance away from the source. The way in which vibration is transmitted through the earth is called propagation. As vibration waves propagate from a source, the energy is spread over an ever-increasing area such that the energy level striking a given point is reduced with the distance from the energy source. This geometric spreading loss is inversely proportional to the square of the distance. Wave energy is also reduced with distance as a result of material damping in the form of internal friction, soil layering, and void spaces. The amount of attenuation provided by material damping varies with soil type and condition as well as the frequency of the wave.

Groundborne vibration can be a concern for nearby residents along a transit system route or maintenance facility, causing buildings to shake and rumbling sounds to be heard. Groundborne vibration is not a common environmental problem. It is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Some common sources of groundborne vibration are trains; buses on rough roads; and construction activities such as blasting, pile-driving, and operating heavy earth-moving equipment.

4.13.1.2 Ambient Noise Measurements

As part of this assessment, ambient noise levels were measured in the Planning Area to provide a characterization of the variability of noise and to assist in determining constraints and opportunities for future development. Ten 15-minute daytime noise level measurements were conducted throughout the study area. Noise measurements were taken with two Larson-Davis LxT Type 1 Integrating Sound Level Meters, serial numbers 3828 and 3829. The following parameters were used:

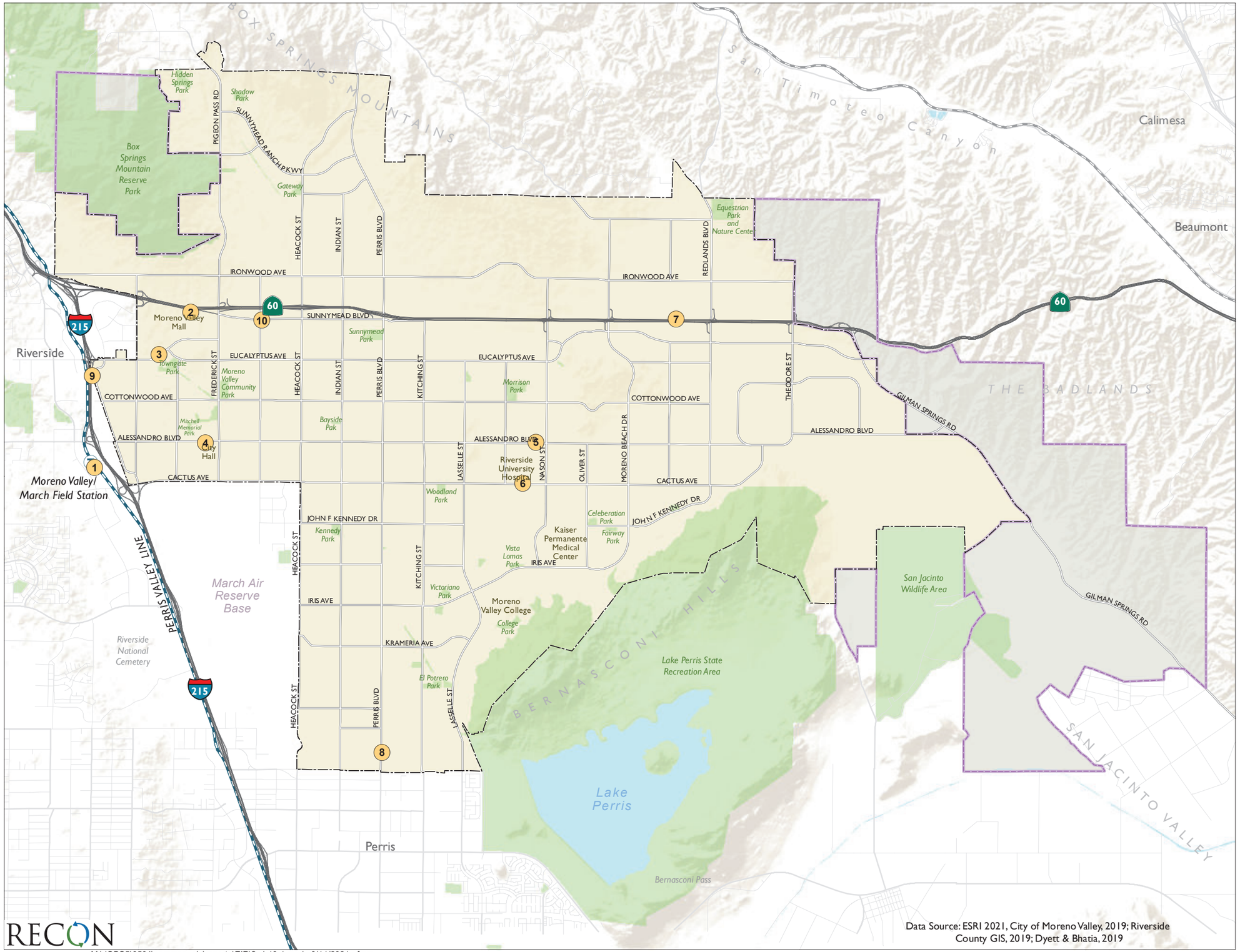
Filter:	A-weighted
Response:	Slow
Time History Period:	5 seconds
Height of Instrument:	5 feet above ground level

Measurement locations are shown in Figure 4.13-1. A summary of the measurements is provided in Table 4.13-2, and traffic counts taken during measurements are summarized in Table 4.13-3. Based on the measurement data, daytime noise levels in the Planning Area are typical of an urban environment. Each measurement location and noise source observed during the measurements is discussed below.

Table 4.13-2
Noise Measurements

Measurement	Location	Date	Time	L_{eq}
1	Moreno Valley/March Field Metro Link Station	12/18/19	10:46 a.m. – 11:01 a.m.	60.1
2	Moreno Valley Mall	12/18/19	11:19 a.m. – 11:34 a.m.	65.5
3	Eucalyptus Ave./ Towngate Center	12/18/19	11:42 a.m. – 11:57 a.m.	67.7
4	Civic Center/ Alessandro Blvd.	12/18/19	12:13 p.m. – 12:28 p.m.	64.1
5	Nason/Alessandro Blvd.	12/18/19	1:15 p.m. – 1:30 p.m.	65.9
6	Riverside County Regional Medical Center/Cactus Ave.	12/18/19	1:37 p.m. – 1:52 p.m.	66.6
7	SR-60	12/19/19	10:46 a.m. – 11:01 a.m.	74.8
8	Warehouse Area/Perris Blvd.	12/19/19	12:07 p.m. – 12:22 p.m.	67.4
9	I-215	12/19/19	1:09 p.m. – 1:24 p.m.	71.3
10	Sunnymead Blvd.	12/19/19	1:55 p.m. – 2:10 p.m.	67.2

L_{eq} = one-hour equivalent noise level.



City of Moreno Valley

Sphere of Influence

Noise Measurement Locations

0 Miles 1

Data Source: ESRI 2021, City of Moreno Valley, 2019; Riverside County GIS, 2019; Dyett & Bhatia, 2019

RECON

M:\JOBS5\9504\common_gis\reports\EIR\fig4.13-1.mxd 3/11/2021 fmm

FIGURE 4.13-1

Noise Measurement Locations

Table 4.13-3
15-Minute Traffic Counts

Measurement	Roadway	Direction[1]	Autos	Medium Trucks	Heavy Trucks	Buses	Motorcycles
2	Town Circle	EB	52	1	0	0	0
		WB	55	0	0	4	1
3	Eucalyptus Ave.	EB	135	0	0	1	0
		WB	117	2	1	1	1
4	Alessandro Blvd.	EB	199	0	5	1	0
		WB	249	4	4	1	1
5	Alessandro Blvd.	EB	96	2	0	1	1
		WB	77	3	0	0	0
6	Cactus Ave.	EB	96	0	0	2	1
		WB	109	2	1	1	0
8	Perris Blvd.	NB	168	8	19	2	0
		SB	136	2	13	2	1
9	Old 215 Frontage Rd.	NB	156	0	2	0	0
		SB	59	1	4	0	0
10	Sunnymead Blvd.	EB	192	2	0	1	0
		WB	162	6	0	1	0

[1]EB = eastbound; WB = westbound; NB = northbound; SB = southbound
NOTE: Traffic counts were not conducted during Measurements 1 or 7 because freeway traffic volumes could not be manually counted.

Measurement 1 was taken at the Moreno Valley/March Field Metro Link Station located west of I-215, east of Meridian Parkway, and south of Alessandro Boulevard. The measurement was located at the fence overlooking the Metrolink tracks, approximately 140 feet from the tracks and 715 feet from I-215. The main source of noise at this measurement location was vehicle traffic on I-215. Other sources of noise included aircraft taking off from March Air Reserve Base (MARB) and distance construction equipment. The average measured noise level was 60.1 dB(A) L_{eq}.

Measurement 2 was located at the northeastern edge of the Moreno Valley Mall, approximately 25 feet from Town Circle and 165 feet south of SR-60. The main source of noise at this location was vehicle traffic on SR-60 and Town Circle. Other noise sources included parking lot activities and buses. Traffic volumes on Town Circle were counted during the 15-minute measurement period. The average measured noise level was 65.5 dB(A) L_{eq}.

Measurement 3 was located near the intersection of Eucalyptus Avenue/Towngate Boulevard and Memorial Way, approximately 50 feet north of Eucalyptus Avenue. The main source of noise at this location was vehicle traffic on Eucalyptus Avenue. Traffic volumes on Eucalyptus Avenue were counted during the 15-minute measurement period. The average measured noise level was 67.7 dB(A) L_{eq}.

Measurement 4 was taken near Moreno Valley City Hall, west of the intersection of Alessandro Boulevard and Frederick Street, approximately 40 feet south of Alessandro Boulevard. The main source of noise at this location was vehicle traffic on Alessandro Boulevard. Other sources of noise included airplanes. Traffic volumes on Alessandro

Boulevard were counted during the 15-minute measurement period. The average measured noise level was 64.1 dB(A) L_{eq}.

Measurement 5 was taken near the intersection of Alessandro Boulevard and Nason Street, approximately 50 feet north of Alessandro Boulevard. The main source of noise at this location was vehicle traffic on Alessandro Boulevard. Other sources of noise included vehicles accessing the driveway south of the measurement location and airplanes. Traffic volumes on Alessandro Boulevard were counted during the 15-minute measurement period. The average measured noise level was 65.9 dB(A) L_{eq}.

Measurement 6 was taken adjacent to the Riverside County Regional Medical Center, approximately 30 feet north of Cactus Avenue. The main source of noise at this location was vehicle traffic on Cactus Avenue. Other sources included noise parking lot activities and an ambulance siren. Traffic volumes on Cactus Avenue were counted during the 15-minute measurement period. The average measured noise level was 66.6 dB(A) L_{eq}.

Measurement 7 was located approximately 85 feet north of SR-60. The main source of noise at this location was vehicle traffic on SR-60. The average measured noise level was 74.8 dB(A) L_{eq}.

Measurement 8 was located within the warehousing area in the southern Planning Area, approximately 50 feet east of Perris Boulevard. The main source of noise was vehicle traffic on Perris Boulevard. Other sources of noise included aircraft from MARB. Traffic volumes on Perris Boulevard were counted during the 15-minute measurement period. The average measured noise level was 67.4 dB(A) L_{eq}.

Measurement 9 was taken at the western boundary of the Planning Area, approximately 30 feet west of Old 215 Frontage Road and 100 feet east of I-215. The main source of noise was vehicle traffic on I-215. Other sources of noise included vehicle traffic on Old 215 Frontage Road and aircraft from MARB. Traffic volumes on Old 215 Frontage Road were counted during the 15-minute measurement period. The average measured noise level was 71.3 dB(A) L_{eq}.

Measurement 10 was taken approximately 50 feet south of Sunnymead Boulevard and 115 feet east of Graham Street. The main source of noise at this location was vehicle traffic on Sunnymead Boulevard. Other sources of noise included vehicle traffic on Graham Street and airplanes. Traffic volumes on Sunnymead Boulevard were counted during the 15-minute measurement period. The average measured noise level was 67.2 dB(A) L_{eq}.

4.13.1.3 Existing Traffic Noise

Major roads generating the greatest noise level in the Planning Area are I-215, SR-60, Alessandro Boulevard, and Perris Boulevard. Additionally, numerous other roads within the Planning Area are also major sources of noise. The noise contour distances represent the predicted noise level for each roadway without the attenuating effects of noise barriers, structures, topography, or dense vegetation. As intervening structures, topography, and dense vegetation would affect noise exposure at a particular location, the noise contours

should not be considered site-specific but are rather guides to determine when detailed acoustic analysis should be undertaken.

Figure 4.13-2 shows the existing vehicle traffic noise contours for the Planning Area. As shown, existing noise levels at areas located closest to the roadways exceed 60 CNEL. The local freeways are the dominant noise sources in the Planning Area. Noise contours from the freeways in many cases overlap with and encompass the noise contours from local roadways.

4.13.1.4 March Air Reserve Base Noise Contours

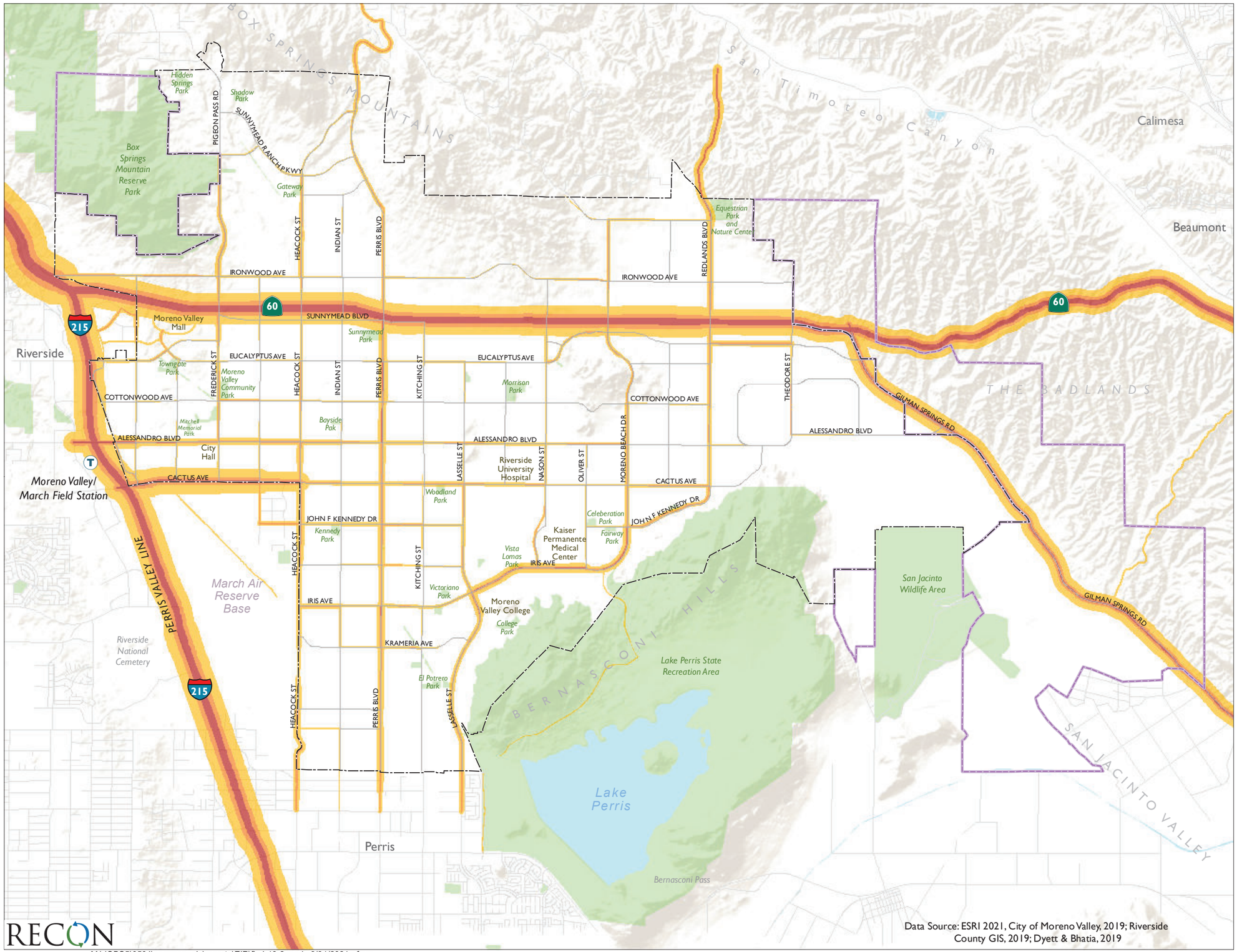
The MARB is a joint-use civilian and military facility located immediately adjacent to the southwestern boundary of the Planning Area. MARB is bordered by the city to the east/northeast, city of Riverside to the northwest, the city of Perris to the south, and unincorporated Riverside County to the west. The Airport Influence Area (AIA) extends up to 9 miles north, west, and east of the main runway and 14 miles to the south, and covers land within unincorporated Riverside County and the cities of Menifee, Moreno Valley, Perris, and Riverside. Land uses in the immediate vicinity of MARB generally consist of public/institutional uses to the west, office/business park and industrial uses to the northwest, office and commercial uses to the north, open space and residential uses to the northeast, open space and industrial uses to the southeast, and open space, agricultural uses, and residential to the south. The MARB noise contours are shown in Figure 4.13-3 (Riverside County Airport Land Use Commission [Riverside County ALUC] 2014).

4.13.1.5 Railroad Noise

Train noise, however intermittent, is a major source of noise due to its magnitude. The San Jacinto Branch Line closely follows the I-215 corridor, bordering the western edge of the city. Both the Metrolink commuter rail and freight trains travel along the corridor. The Metrolink commuter rail 91/Perris Valley Line stops at the Moreno Valley/March Air Field Station, located between Eucalyptus Avenue and Cactus Avenue on the western border of the city. Commuter trains stop several times a day in the morning and evening, and freight trains pass through about twice a day.

4.13.1.6 Industrial Noise

Industrial uses, including manufacturing, warehousing, and distribution-related uses, are another source of noise that can have a varying degree of impact on adjacent uses. Mechanical equipment, generators, and vehicles associated with these uses all contribute to noise levels at industrial sites. Existing industrial uses are largely concentrated in the southwestern portion of the city, adjacent to MARB and I-215. While industrial uses are generally concentrated at the periphery of the city, the potential for noise conflicts exists where these uses would abut residential areas.



City of Moreno Valley

Sphere of Influence

Existing Noise Contours

65 to 70 CNEL

70 to 75 CNEL

> 75 CNEL

0 Miles 1

Data Source: ESRI 2021, City of Moreno Valley, 2019; Riverside County GIS, 2019; Dyett & Bhatia, 2019

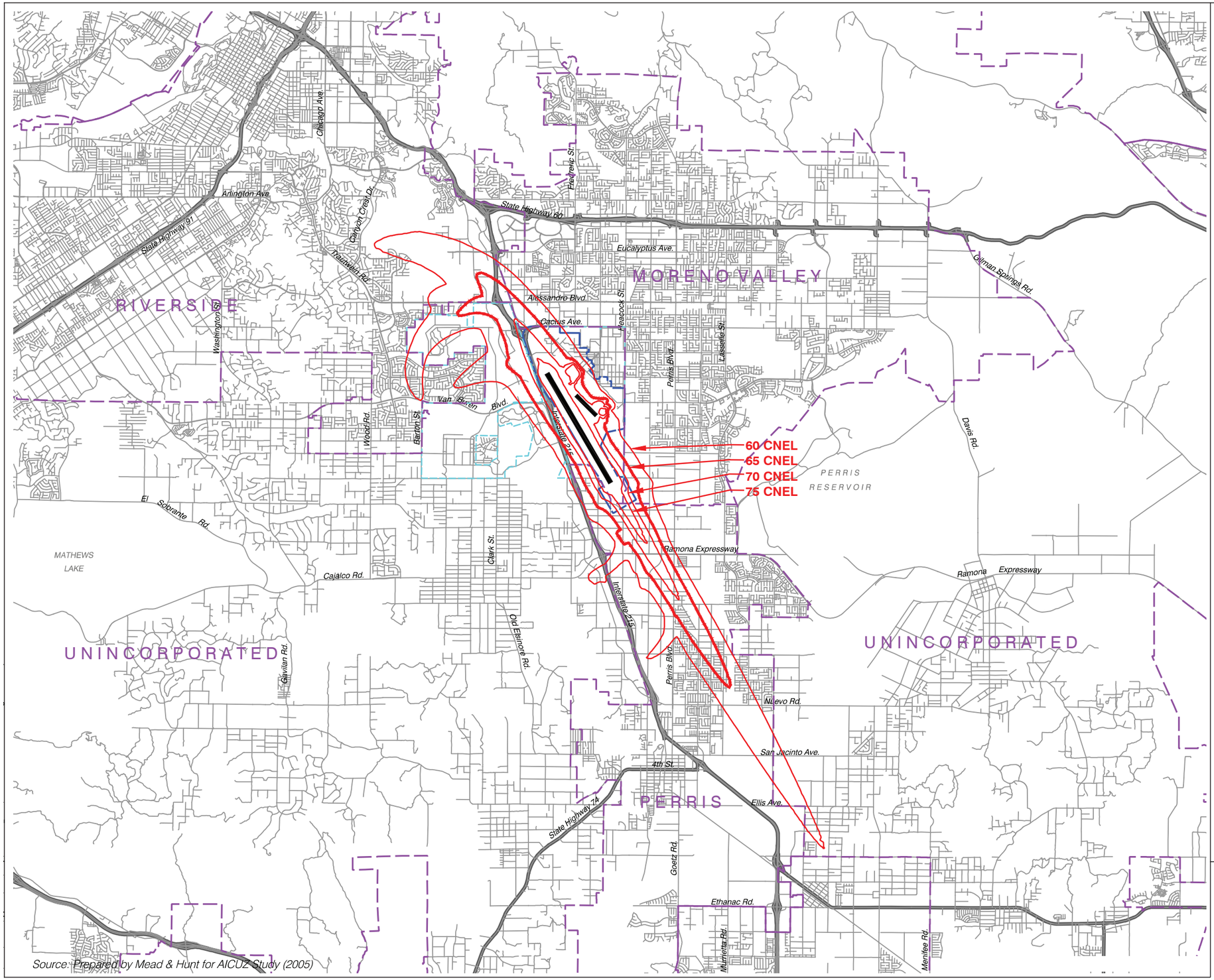
RECON

M:\JOBS5\9504\common_gis\reports\EIR\fig4.13-2.mxd 3/31/2021 fmm

FIGURE 4.13-2

Existing Vehicle Traffic Noise Contours

Map Source: March Air Reserve Base Land Use Compatibility Plan, 2014



Source: Prepared by Mead & Hunt for AICUZ Study (2005)

LEGEND

Noise Contours

- 60 dB CNEL
- 65 dB CNEL
- 70 dB CNEL
- 75 dB CNEL

Projected Activity Level (75,104 operations)

Boundary Lines

- March Air Reserve Base / Inland Port Airport
- March Joint Powers Authority Property Line
- City Limits

Projected Activity Level	
Annual Operations	75,104
Average Annual Day	206

Note:

Contours represent composite of noise contours from four sources:

- Forecasts and noise contours from Air Installation Compatible Use Study for March Air Reserve Base (August 2005).
- Environmental Assessment for Proposed Military Construction and Total Force Integration at March Air Reserve Base (Air Force Reserve Command, June 2010); Environmental Impact Report for March Inland Port General Aviation Facilities Development (March Joint Powers Authority, August 2012).
- F-15 Aircraft Conversion Environmental Impact Statement 144th Fighter Wing California Air National Guard Fresno-Yosemite International Airport (National Guard Bureau, March 2013).

N

2 MILES

0 MILES 4 MILES

RECON

M:\JOBS5\9504\nos\graphics\fig4.13-3.ai 03/23/21 fmm

FIGURE 4-13.3
March Air Reserve Base Noise Contours

4.13.2 Applicable Regulatory Requirements

4.13.2.1 Federal

a. Construction Noise

The FTA provides financial and technical assistance to local public transit systems, including buses, subways, light rail, commuter rail, trolleys and ferries. FTA also oversees safety measures. The FTA's Transit Noise and Vibration Impact Assessment manual indicates that 80 dB(A) L_{eq} is reasonable criteria for assessing construction noise levels at residential uses (FTA 2018).

b. Vibration

The FTA provides criteria for acceptable levels of groundborne vibration for various types of buildings. Structures amplify groundborne vibration; wood-frame buildings, such as typical residential structures, are more affected by ground vibration than heavier buildings. The level at which groundborne vibration is strong enough to cause architectural damage has not been determined conclusively, but the standards recommended by the FTA are shown in Table 4.13-4.

Table 4.13-4
Construction Vibration Damage Criteria

Building/Structural Category	PPV (in/sec)	Approximate VdB
I. Reinforced-concrete, steel or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Non-engineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

SOURCE: FTA 2018.
PPV = peak particle velocity
in/sec = inch per second
VdB = vibration decibel

The FTA also provides guidance for assessing vibration impacts from railroad operations. The criteria for determining the significance of impacts are presented in Table 4.13-5.

Table 4.13-5
Guidelines for Determining the Significance of Groundborne Vibration and Noise Impacts

Land Use Category	Groundborne Vibration Impact Levels (VdB re 1 micro-inch per second)			Groundborne Noise Impact Levels (dB re 20 micro Pascals)		
	Frequent Events	Occasional Events	Infrequent Events	Frequent Events	Occasional Events	Infrequent Events
Category 1: Buildings where low ambient vibration is essential for interior operations (research & manufacturing facilities with special vibration constraints)[6]	65 VdB	65 VdB	65 VdB	N/A	N/A	N/A
Category 2: Residences and buildings where people normally sleep (hotels, hospitals, residences, & other sleeping facilities)[6]	72 VdB	75 VdB	80 VdB	35 dB(A)	38 dB(A)	43 dB(A)
Category 3: Institutional land uses with primarily daytime use (schools, churches, libraries, other institutions, & quiet offices)[6]	75 VdB	78 VdB	83 VdB	40 dB(A)	43 dB(A)	48 dB(A)

SOURCE: FTA 2018.
VdB = vibration decibel; re = relative; N/A = not applicable
"Frequent Events" is defined as more than 70 vibration events per day. Most rapid transit projects fall into this category.
"Occasional Events" is defined as 30 to 70 vibration events per day. Most commuter trunk links fall into this category
"Infrequent Events" is defined as fewer than 70 vibration events per day. This category includes most commuter rail systems.

For Category 1 uses such as vibration sensitive equipment, the screening distance from the right-of-way is 600 feet. For Category 2 land uses such as residences and buildings where people would normally sleep, the screening distance is 200 feet. The screening distance for Category 3 land uses such as institutional land uses with primarily daytime uses, is 120 feet.

4.13.2.2 State

a. General Plan Guidelines

The State of California, through its General Plan Guidelines, discusses how ambient noise should influence land use and development decisions and includes a table of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable uses at different noise levels, expressed in CNEL (Governor's Office of Planning and Research 2017). This table provides a tool to gauge the compatibility of land uses relative to existing and future noise levels. It provides land use compatibility guidelines that local jurisdictions can use as a guide for establishing its own General Plan noise compatibility levels that reflect the noise-control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution. The compatibility guidelines identify normally acceptable, conditionally acceptable, and clearly unacceptable noise levels for various land uses. A conditionally acceptable designation implies new construction or development should be undertaken only after detailed analysis of the noise reduction requirements for each land use, and needed noise insulation features are

incorporated in the design. By comparison, a normally acceptable designation indicates that standard construction can occur with no special noise reduction requirements.

b. California Code of Regulations

Interior noise levels for residential habitable rooms are regulated by Title 24 of the California Code of Regulations California Noise Insulation Standards. Title 24, Chapter 12, Section 1206.4, of the 2019 California Building Code requires that interior noise levels attributable to exterior sources not exceed 45 CNEL in any habitable room (California Code of Regulations 2019). A habitable room is a room used for living, sleeping, eating, or cooking. Bathrooms, closets, hallways, utility spaces, and similar areas are not considered habitable rooms for this regulation (Title 24 California Code of Regulations, Chapter 12, Section 1206.4).

For non-residential structures, Title 24, Chapter 12, Section 1207.5 refers to 2019 California Green Building Standards, Chapter 5 – Nonresidential Mandatory Measures, Division 5.5 – Environmental Quality, Section 5.507 – Environmental Comfort, Subsection 5.507.4 – Acoustical Control. Pursuant to these standards, all non-residential building construction shall employ building assemblies and components that achieve a composite sound transmission class rating of at least 50 or shall otherwise demonstrate that exterior noise shall not result in interior noise environment where noise levels exceed 50 dB(A) L_{eq} in occupied areas during any hour of operation.

4.13.2.3 Riverside County Airport Land Use Commission

As described in Section 4.13.1.4 above, MARB is located immediately adjacent to the southwestern boundary of the Planning Area. The Riverside County ALUC prepares airport land use compatibility plans (ALUCP) in order to promote compatibility between airports and the land uses surrounding them. ALUCPs set compatibility criteria applicable to local agencies in their preparation or amendment of land use plans and ordinances. The Riverside County ALUCP was adopted in 2004, and provides general guidelines applicable to all airports under Riverside County ALUC jurisdiction (Riverside County ALUC 2004). The MARB/Inland Port Airport (IPA) ALUCP was adopted in 2014 and provides guidelines specific to MARB (Riverside County ALUC 2014). The MARB/IPA ALUCP provides the following noise guidelines for MARB:

a. Countywide Policy 4.1.5: The CNEL considered normally acceptable for new residential land uses in the vicinity of MARB/IPA is 65 dB.

b. Countywide Policy 4.1.6: Single-event noise levels from aircraft operations can be particularly intrusive at night. Compared to other airports in the county, current and projected nighttime activity by large aircraft at March ARB/IPA warrants a greater degree of sound attenuation for the interiors of buildings housing certain uses as cited below.

1. The maximum, aircraft-related, interior noise level that shall be considered acceptable shall be CNEL 40 dB for all new residences, schools, libraries, museums, hotels and motels, hospitals and nursing homes, places of worship, and other noise-sensitive uses. For office uses, the interior standard shall be CNEL 45 dB, the same as the countywide criterion.

2. To ensure compliance with these criteria, an acoustical study shall be required to be completed for any development proposed to be situated where the aviation-related noise exposure is more than 20 dB above the interior standard (e.g., within the CNEL 60 dB contour where the interior standard is CNEL 40 dB). Standard building construction is presumed to provide adequate sound attenuation where the difference between the exterior noise exposure and the interior standard is 20 dB or less.

4.13.2.4 City of Moreno Valley

a. Municipal Code

Operational Noise

The City regulates noise through the Municipal Code under Title 11 Peace, Morals and Safety, Chapter 11.80, Noise Regulation. Tables 4.13-6 and 4.13-7 summarize the maximum continuous and maximum impulsive noise level limits specified in Section 11.80.030(B)(1) of the Municipal Code.

Table 4.13-6
Maximum Continuous Sound Levels

Duration per Day Continuous Hours	Sound Level Limit [dB(A) L_{eq}]
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5.	110
0.2.5	115

dB(A) = A-weighted decibels.
L_{eq} = one-hour equivalent noise level.

Table 4.13-7 Maximum Impulsive Sound Levels	
Number of Repetitions per 24-Hour Period	Sound Level Limit [dB(A) L_{eq}]
1	145
10	135
100	125
dB(A) = A-weighted decibels. L_{eq} = one-hour equivalent noise level.	

Section 11.80.030(C) provides noise level limits for non-impulsive noise. The section states "No person shall maintain, create, operate or cause to be operated on private property any source of sound in such a manner as to create any non-impulsive sound which exceeds the limits set forth for the source land use category in Table 11.80.030-2 when measured at a distance of two hundred (200) feet or more from the real property line of the source of the sound, if the sound occurs on privately owned property, or from the source of the sound, if the sound occurs on public right-of-way, public space or other publicly owned property." The sound level limits provided in Table 11.80.030-2 of the Municipal Code are summarized in Table 4.13-8.

Table 4.13-8 Maximum Sound Levels for Source Land Uses [dB(A) L_{eq}]			
Residential		Commercial	
Daytime	Nighttime	Daytime	Nighttime
60	55	65	60
dB(A) = A-weighted decibels. L_{eq} = one-hour equivalent noise level.			

Construction Noise

The Municipal Code limits construction activities in two parts of the code: Sections 8.14.040(E) and 11.80.030(D)(7). Section 8.14.040(E) states that construction within the city shall only occur from 7:00 a.m. to 7:00 p.m. from Monday through Friday excluding holidays and from 8:00 a.m. to 4:00 p.m. on Saturdays. Section 11.80.030(D)(7) states that no person shall operate or cause the operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work between the hours of 8:00 p.m. and 7:00 a.m. such that the sound creates a noise disturbance. For power tools, specifically, 11.80.030(D)(9) states that no person shall operate or permit the operation of any mechanically, electrically or gasoline motor-driven tool during nighttime hours that causes a noise disturbance across a residential property line. A noise disturbance is defined as any sound that disturbs a reasonable person of normal sensitivities, exceeds the sound level limits set forth in the Noise Ordinance, or is plainly audible (as measured at a distance of 200 feet from the property line of the source of the sound if the sound occurs on privately owned property, or public right-of-way, public space, or other publicly owned property).

Vibration

The Municipal Code does not establish quantified limits for vibration levels. Section 9.10.170 states that "No vibration shall be permitted which can be felt at or beyond the property line."

4.13.3 Methodologies for Determining Impacts

4.13.3.1 Vehicle Traffic Noise

Traffic noise occurs adjacent to every roadway and is directly related to the traffic volume, speed, and mix of vehicles. Existing and future traffic volumes, speeds, and truck percentages for each roadway segment in the Planning Area, as well as the day/evening/nighttime traffic distribution, were obtained from the traffic engineer. The Federal Highway Administration (FHWA) Traffic Noise Model algorithms were used to calculate distances to noise contours for each roadway. The FHWA model takes into account traffic mix, speed, and volume; roadway gradient; relative distances between sources, barriers, and sensitive receptors; and shielding provided by intervening terrain or structures.

The analysis of the noise environment considered that the topography was flat with no intervening terrain between sensitive land uses and roadways. Because modeled predicted noise levels do not account for obstructions, they are higher than those which would actually occur. In actuality, buildings and other obstructions along the roadways would shield distant receivers from the traffic noise. Existing and future vehicle traffic noise calculations are provided in Appendix D.

4.13.3.2 Railroad Noise

The Metrolink commuter rail 91/Perris Valley Line operates adjacent to the Planning Area. Based on published schedules, there are four inbound Metrolink trains that stop at the Moreno Valley/March Field station between 4 a.m. and 7 a.m. Monday through Friday, and four outbound trains between 5 p.m. and 8 p.m. Monday through Friday. Fewer trains operate on Saturday and Sunday. Additionally, freight trains pass through about twice a day. Noise associated with railroad operations was modeled using the FTA recommended Chicago Rail Efficiency and Transportation Efficiency (CREATE) railroad noise model (Harris Miller & Hanson, Inc. 2006). All trains were modeled at 60 miles per hour (mph). For a worst-case analysis, it was assumed that the freight trains would operate during the nighttime hours. Noise contour distances were calculated assuming flat-site conditions and no intervening buildings that would provide noise attenuation.

4.13.3.3 Stationary Noise

Stationary sources of noise include activities associated with a given land use. The Planning Area includes multiple land uses, including residential, commercial, industrial, and mixed-use land uses. Various land uses contain on-site stationary noise sources, including rooftop heating, ventilation, and air conditioning (HVAC) equipment; mechanical equipment; emergency electrical generators; parking lot activities; loading dock operations; and

recreation activities. Stationary noise is considered a "point source" and attenuates over distance at a rate of 6 dB(A) for each doubling of distance. The exact location and nature of future stationary noise sources is not known at this time, and therefore cannot be calculated in this analysis. Impacts were assessed in this analysis by identifying potential types of stationary sources and locations of mixed-use land use interfaces and identifying applicable regulations and mitigation framework for addressing impacts.

4.13.3.4 Construction Noise

Construction noise has the potential to result in temporary ambient noise increase due to construction activities. Construction noise is generated by diesel-powered construction equipment used for site preparation and grading, removal of existing structures and pavement, loading, unloading, and placing materials and paving. Diesel engine-driven trucks also bring materials to the site and remove the spoils from excavation. Table 4.13-9 summarizes typical construction equipment noise levels.

Construction equipment would generate maximum noise levels between 70 and 95 dB(A) L_{max} at 50 feet from the source when in operation. During excavation, grading, and paving operations, equipment moves to different locations and goes through varying load cycles, and there are breaks for the operators and for non-equipment tasks, such as measurement. Average construction noise levels were calculated for the simultaneous operation of three common pieces of construction equipment: backhoe, excavator, and loader. The usage factors were applied to the maximum noise level at 50 feet for each piece of equipment, and then noise levels were added logarithmically. Hourly average noise levels would be approximately 83 dB(A) L_{eq} at 50 feet from the center of construction activity when assessing three pieces of common construction equipment working simultaneously. Noise levels would vary depending on the nature of the construction including the duration of specific activities, nature of the equipment involved, location of the particular receiver, and nature of intervening barriers.

Table 4.13-9
Typical Construction Equipment Noise Levels

Equipment	Noise Level at 50 Feet [dB(A) L_{eq}]	Typical Duty Cycle
Auger Drill Rig	85	20%
Backhoe	80	40%
Blasting	94	1%
Chain Saw	85	20%
Clam Shovel	93	20%
Compactor (ground)	80	20%
Compressor (air)	80	40%
Concrete Mixer Truck	85	40%
Concrete Pump	82	20%
Concrete Saw	90	20%
Crane (mobile or stationary)	85	20%
Dozer	85	40%
Dump Truck	84	40%
Excavator	85	40%
Front End Loader	80	40%
Generator (25 kilovolt ampts or less)	70	50%
Generator (more than 25 kilovolt amps)	82	50%
Grader	85	40%

Table 4.13-9 Typical Construction Equipment Noise Levels		
Equipment	Noise Level at 50 Feet [dB(A) L_{eq}]	Typical Duty Cycle
Hydra Break Ram	90	10%
Impact Pile Driver (diesel or drop)	95	20%
In situ Soil Sampling Rig	84	20%
Jackhammer	85	20%
Mounted Impact Hammer (hoe ram)	90	20%
Paver	85	50%
Pneumatic Tools	85	50%
Pumps	77	50%
Rock Drill	85	20%
Roller	74	40%
Scraper	85	40%
Tractor	84	40%
Vacuum Excavator (vac-truck)	85	40%
Vibratory Concrete Mixer	80	20%
Vibratory Pile Driver	95	20%
SOURCE: FHWA 2006. dB(A) = A-weighted decibels L_{eq} = one-hour equivalent noise level.		

4.13.3.5 Vibration

Potential sources of groundborne vibration include construction activities, railroad activities, and stationary sources. Table 4.13-10 lists vibration levels for construction equipment.

Table 4.13-10 Vibration Levels for Construction Equipment	
Equipment	Approximate PPV Vibration Level at 25 feet (inch/second)
Pile Driver, Impact (Upper Range)	1.518
Pile Drive, Impact (Typical)	0.644
Pile Driver, Sonic (Upper Range)	0.734
Pile Drive, Sonic (Typical)	0.170
Vibratory Roller	0.210
Large Bulldozer	0.089
Caisson Drilling	0.089
Loaded Trucks	0.076
Jackhammer	0.035
Small Bulldozer	0.003
SOURCE: FTA 2018. PPV = peak particle velocity	

Vibration impacts due to construction equipment were evaluated using these source vibration levels and the FTA criteria shown in Table 4.13-4. Vibration impacts due to railroad operations were evaluated using the FTA criteria shown in Table 4.13-5 and the FTA screening distances for each land use category. Vibration impacts due to stationary sources were addressed qualitatively.

4.13.4 Basis for Determining Significance

Thresholds used to evaluate noise impacts are based on applicable criteria in the California Environmental Quality Act (CEQA) Guidelines (California Code of Regulations Sections 15000-15387), Appendix G. A significant impact would occur if the project would:

1) Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;

2) Generate excessive groundborne vibration or groundborne noise levels; or

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

4.13.5 Impact Analysis

4.13.5.1 Topic 1: Increase in Ambient Noise

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

The 2021 GPU Noise Element builds upon the adopted 2006 General Plan policies and provides noise compatibility guidelines. Table 4.13-11 summarizes the 2021 GPU noise compatibility guidelines provided in Table N-1 of the Noise Element.

Table 4.13-11
Community Noise Compatibility Matrix

	Community Noise Exposure (CNEL)						
	55	60	65	70	75	80	
Residential – Low Density Single Family, Duplex, Mobile Homes	A			B	C	D	
Residential – Multiple Family	A			B	C	D	
Transient Lodging – Motels, Hotels	A			B	C		D
Schools, Libraries, Churches, Hospitals, Nursing Homes	A				C		D
Auditoriums, Concert Halls, Amphitheaters	B				C		
Sports Arena, Outdoor Spectator Sports	B					C	
Playgrounds, Neighborhood Parks	A				B	C	
Golf Courses, Riding Stables, Water Recreation, Cemeteries	A					C	D
Office Buildings, Business Commercial and Professional	A				B	C	
Industrial, Manufacturing, Utilities, Agriculture	A					B	C

Table 4.13-11 Community Noise Compatibility Matrix	
A	**Normally Acceptable:** Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
B	**Conditionally Acceptable:** New construction or development should be undertaken only after a detailed analysis of the noise reduction requirement is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.
C	**Normally Unacceptable:** New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
D	**Clearly Unacceptable:** New construction or development should generally not be undertaken.

The 2021 GPU Noise Element contains the following goals, policies, and actions that would be intended to address ambient noise.

Goal

N-1: Design for a pleasant, healthy sound environment conducive to living and working.

Policies

N.1-1: Protect occupants of existing and new buildings from exposure to excessive noise, particularly adjacent to freeways, major roadways, the railroad, and within areas of aircraft overflight.

N.1-2: Guide the location and design of transportation facilities, industrial uses, and other potential noise generators to minimize the effects of noise on adjacent land uses.

N.1-3: Apply the community noise compatibility standards (Table N-1) to all new development and major redevelopment projects outside the noise and safety

compatibility zones established in the March Air Reserve Base/Inland Port Airport Land Use Compatibility (ALUC) Plan in order to protect against the adverse effects of noise exposure. Projects within the noise and safety compatibility zones are subject to the standards contained in the ALUC Plan.

N.1-4: Require a noise study and/or mitigation measures if applicable for all projects that would expose people to noise levels greater than the "normally acceptable" standard and for any other projects that are likely to generate noise in excess of these standards.

N.1-5: Noise impacts should be controlled at the noise source where feasible, as opposed to at receptor end with measures to buffer, dampen, or actively cancel noise sources. Site design, building orientation, building design, hours of operation, and other techniques, for new developments deemed to be noise generators shall be used to control noise sources.

N.1-6: Require noise buffering, dampening, or active cancellation, on rooftop or other outdoor mechanical equipment located near residences, parks, and other noise sensitive land uses.

N.1-7: Developers shall reduce the noise impacts on new development through appropriate means (e.g. double-paned or soundproof windows, setbacks, berming, and screening). Noise attenuation methods should avoid the use of visible sound walls where possible.

Actions

N.1-A: Continue to review proposed projects for conformance with the March Air Reserve Base/Inland Port Airport Land Use Compatibility Plan, including consideration of the Compatibility Zone Factors shown in Table MA-1 and the Basic Compatibility Criteria shown in Table MA-2, as may be amended.

N.1-C: Study the feasibility of using alternative pavement materials such as rubberized asphalt pavements on roadways to reduce noise generation. Update City standards as appropriate.

Goal

N-2: Ensure that noise does not have a substantial, adverse effect on the quality of life in the community.

Policies

N.2-1: Use the development review process to proactively identify and address potential noise compatibility issues.

N.2-2: Continue to work with community members and business owners to address noise complaints and ensure voluntary resolution of issues through the enforcement of Municipal Code provisions.

N.2-3: Limit the potential noise impacts of construction activities on surrounding land uses through noise regulations in the Municipal Code that address allowed days and hours of construction, types of work, construction equipment, and sound attenuation devices.

N.2-4: Collaborate with the March Joint Powers Authority, March Inland Port Airport Authority, Riverside County Airport Land Use Commission, and other responsible agencies to formulate and apply strategies to address noise and safety compatibility protection from airport operations.

N.2-5: Encourage residential development heavily impacted by aircraft-related noise to transition to uses that are more compatible.

Actions

N.2-A: Continue to maintain performance standards in the Municipal Code to ensure that noise generated by proposed projects is compatible with surrounding land uses.

N.2-B: Update the Municipal Code to establish controls on outdoor noise in public places, such as outdoor dining terraces in commercial mixed use areas, public plazas, or parks. Controls may include limits on noise levels or hours of operation.

a. Traffic Noise

Increase in Ambient Noise

Long-term traffic noise that affects sensitive land uses would be considered substantial and constitute a significant noise impact if the project would:

- Increase noise levels by 5 dB or more where the no project noise level is less than 60 CNEL;
- Increase noise levels by 3 dB or more where the no project noise level is 60 CNEL to 65 CNEL; or
- Increase noise levels by 1.5 dB or more where the no project noise level is greater than 65 CNEL.

The noise analysis is based on the baseline (year 2018) and future (year 2040) traffic volume data. The traffic analysis included over 4,000 roadway segments within an approximate 10 to 15 miles radius of the Planning Area. For purposes of the noise analysis, only the 620 roadway segments located within the Planning Area were analyzed. The change in noise level was calculated for all 620 roadway segments, as well as I-215 and SR-60, for buildout of the project as well as buildout of the existing 2006 General Plan. Noise impacts were

determined by comparing the change in noise levels between the existing condition and buildout of the project to the criteria listed above. For informational purposes, this analysis also includes a discussion of the difference in impacts that would occur when compared to buildout of the existing 2006 General Plan.

Based on the impact criteria above, project buildout would result in a significant noise increase over existing ambient noise levels at 338 of the analyzed roadway segments. The impacted segments are summarized in Table 4.13-12. Complete calculations for all roadways segments are included in Appendix D.

Table 4.13-12
Significant Traffic Noise Increases Along Study Roadway Segments

Roadway	Segment	Existing Noise Level (CNEL at 50 feet)	GPU Year 2040 Noise Level (CNEL at 50 feet)	Noise Increase (dB)
Alessandro Boulevard	I-215 to Frederick Street	71.7 - 76.3	73.5 - 78.1	1.8 - 2.6
Alessandro Boulevard	Graham Street to Quincy Street	61.7 - 71.5	65.3 - 74.8	2.0 - 6.4
Alta Calle	Via Del Lago to Lake Perris Drive	63.7 - 63.8	67.4 - 68.7	3.6 - 4.9
Box Springs Road	I-215 to Pigeon Pass Road	68.0 - 69.5	71.0 - 72.1	2.6 - 3.0
Cactus Avenue	I-215 to Day Street	77	79.1	2.1
Cactus Avenue	Graham Street to Heacock Street	76	78.0 - 78.1	2.0 - 2.1
Cactus Avenue	Kitching Street to Lasselle Street	70.1	71.7	1.6
Cactus Avenue	Nason Street to Redlands Boulevard	65.5 - 68.8	70.8 - 72.4	3.2 - 5.5
Cottonwood Avenue	Elsworth Street to Morrison Street	54.9 - 67.1	62.6 - 69.6	2.3 - 7.7
Cottonwood Avenue	Moreno Beach Drive to Quincy Street	64.4	67.5 - 70.3	3.1 - 5.9
Day Street	Box Springs Road to Cactus Avenue	62.6 - 70.6	67.6 - 73.0	1.8 - 9.0
Dracaea Avenue	Indian Street to Perris Boulevard	56.1	61.5	5.4
Dracaea Avenue	Kitching Street to Lasselle Street	60.2	63.3	3.1
E Oleander Avenue	Lasselle Street to Alta Calle	63.3	61.6	8.3
Elsworth Street	Alessandro Boulevard to Cactus Avenue	65.6	70.6	5
Eucalyptus Avenue	I-215 to Moreno Beach Drive	62.0 - 68.8	69.2 - 71.8	2.0 - 7.6
Eucalyptus Avenue	Redlands Boulevard to Theodore Avenue	70.9	73.4	2.5
Evans Road	South of E Oleander Avenue	70.2	73	2.8
Frederick Street	Townsgate Avenue to Sunnymead Boulevard	70.7 - 71.3	73.0 - 73.5	2.2 - 2.3
Genetian Avenue	Heacock Street to Perris Boulevard	61.0 - 65.8	66.0 - 68.0	2.1 - 5.5
Gilman Springs Road	SR-60 to State Street	75.8 - 76.1	78.0 - 78.6	1.9 - 2.8
Graeber Street	Cactus Avenue to Riverside Drive	64.5 - 65.9	69.2	3.3 - 4.7
Graham Street	Sunnymead Boulevard to Eucalyptus Avenue	62.3	66.5	4.2
Graham Street	Dracaea Avenue to Cottonwood Avenue	58.6	64.2	5.6
Graham Street	Alessandro Boulevard to Cactus Avenue	62.9 - 64.3	66.2 - 68.7	3.3 - 4.4
Heacock Street	Cactus Avenue to San Michelle Avenue	68.4 - 72.3	70.3 - 74.9	1.6 - 3.5
Hidden Springs Drive	Pigeon Pass Road to Mountain View Road	47.4	64.3	16.9
Indian Street	SR-60 to Eucalyptus Avenue	60.3 - 61.0	64.5 - 65.0	3.5 - 4.3
Indian Street	John F Kennedy Drive to Iris Avenue	61.0 - 61.2	64.2 - 64.9	3.1 - 3.9
Indian Street	South of Krameria Avenue	62.1 - 63.6	65.8 - 69.6	3.2 - 6.9
Iris Avenue	Perris Boulevard to Via Del Lago	68.7 - 73.0	72.2 - 77.1	1.8 - 5.4
Ironwood Avenue	Graham Street to Heacock Street	66.5	69	2.5

Table 4.13-12
Significant Traffic Noise Increases Along Study Roadway Segments

Roadway	Segment	Existing Noise Level (CNEL at 50 feet)	GPU Year 2040 Noise Level (CNEL at 50 feet)	Noise Increase (dB)
Ironwood Avenue	Perris Boulevard to Highland Boulevard	47.5 - 67.0	57.7 - 69.5	1.7 - 10.2
Jack Rabbit Trail	Northeast of Gilman Springs Road	66.3	70.1	3.8
John F Kennedy Drive	Heacock Street to Indian Street	68.4	70.1	1.7
John F Kennedy Drive	Kitching Street to Lasselle Street	68.1	70.5	2.4
John F Kennedy Drive	Moreno Beach Drive to Redlands Boulevard	69.5 - 70.9	72.6 - 73.4	2.5 - 3.8
Kitching Street	Sunnymead Boulevard to Alessandro Boulevard	59.5 - 66.9	64.6 - 70.6	3.3 - 5.1
Kitching Street	Iris Avenue to Krameria Avenue	64.3	69	4.7
Lake Perris Drive	South of Alta Calle	58.2 - 63.4	65.0 - 70.0	4.6 - 6.8
Lasselle Street	Eucalyptus Avenue to Evans Road	63.6 - 72.4	68.3 - 74.2	1.7 - 5.8
Manzanita Avenue	Indian Street to Reche Vista Drive	53.3 - 54.4	60.1 - 60.4	6.0 - 6.8
Moreno Beach Drive	Ironwood Avenue to Eucalyptus Avenue	67.8 - 68.6	70.4 - 74.7	3.2 - 6.1
Moreno Beach Drive	Cottonwood Avenue to Cactus Avenue	69.6 - 69.8	72.0 - 72.4	2.2 - 2.6
Moreno Beach Drive	John F Kennedy Drive to Via Del Lago	72.2	75.4	3.2
N. Webster Avenue	Harley Knox Boulevard to E Marjham Street	70.2 - 71.1	73.6	2.5 - 3.1
Nason Street	SR-60 to Iris Avenue	66.5 - 68.3	70.3 - 72.8	2.0 - 5.6
Old I-215 Frontage Road	Eucalyptus Avenue to Cactus Avenue	62.0 - 69.0	69.0 - 75.1	3.9 - 7.0
Perris Boulevard	Reche Vista Drive to Sunnymead Boulevard	67.2 - 72.9	71.6 - 74.5	1.6 - 4.4
Perris Boulevard	South of Alessandro Boulevard	69.0 - 72.5	73.3 - 76.1	1.8 - 5.7
Pigeon Pass Road	Hidden Springs Drive to Sunnymead Ranch Park	57.6 - 57.9	63.9 - 64.1	6.2 - 6.3
Reche Vista Drive	North of Heacock Street	70.2	72.7	2.5
Redlands Boulevard	San Timoteo Canyon Road to Cactus Avenue	69.9 - 72.6	73.2 - 75.3	2.2 - 6.1
Riverside Drive	Meyer Street to Graeber Street	57	65	8
San Michelle Avenue	Indian Street to Perris Boulevard	50	55.8	5.8
Sunnymead Boulevard	Frederick Street to Kitching Street	59.4 - 68.8	66.9 - 71.5	2.7 - 7.7
Sunnymead Ranch Parkway	Lake Vista Road to Heacock Street	53.5 - 66.9	63.8 - 68.7	1.8 - 10.3
Theodore Avenue	SR-60 to Alessandro Boulevard	64.7 - 67.4	69.7 - 80.0	5.0 - 13.3
Town Circle	North of Campus Parkway	64.6 - 66.5	69.1	2.6 - 4.5
Towngate Avenue	Eucalyptus Avenue to Frederick Street	65.6	71.2	5.6
Via Del Lago	John F Kennedy Drive to Alta Calle	64.2	68.7 - 69.0	4.5 - 4.8

CNEL = community noise equivalent level
dB = decibels

It should be noted that without approval of the project, a significant increase in ambient noise levels would also occur with buildout with the existing 2006 General Plan. Based on the impact criteria above, a significant noise increase would occur at 339 of the analyzed roadway segments under buildout of the existing 2006 General Plan. A majority of the roadway segments that would be affected by a significant increase in ambient noise levels would be the same as those identified for buildout of both the project and existing 2006 General Plan. The two bullet lists below present the exceptions where some roadway segments would only

be affected by a significant increase in ambient noise levels under buildout of the project, or buildout of the existing 2006 General Plan:

- Project buildout would result in a significant increase in ambient noise levels at the roadway segments listed below. These roadway segments would not be impacted under buildout of the existing 2006 General Plan:
  - Alessandro Boulevard – Moreno Beach Drive to Quincy Street
  - Cactus Avenue – Kitching Street to Lasselle Street
  - Cottonwood Avenue – Indian Street to Perris Boulevard
  - Genetian Avenue – Indian Street to Perris Boulevard
  - Iris Avenue – Nason Street to the Moreno Valley Medical Center
  - Ironwood Avenue – Nason Street to Moreno Beach Drive
  - John F Kennedy Drive – Kitching Street to Lasselle Street
  - John F Kennedy Drive – Heacock Street to Indian Street
  - Kitching Street – Cottonwood Avenue to Alessandro Boulevard
  - Lasselle Street – Iris Avenue to College Drive
  - Lasselle Street – Eucalyptus Avenue to Dracaea Avenue
  - Lasselle Street – John F Kennedy Drive to Gentian Avenue

- Buildout of the existing 2006 General Plan would result in a significant increase in ambient noise levels at the roadway segments listed below. These roadway segments would not be impacted under buildout of the project:
  - Day Street – Box Springs Road to SR-90 Westbound Off-Ramp
  - Graham Street – Eucalyptus Avenue to Dracaea Avenue
  - Graham Street – Hemlock Avenue to Sunnymead Boulevard
  - Indian Street – Alessandro Boulevard to Brodiaea Avenue
  - Indian Street – Cottonwood Avenue to Bay Avenue
  - Ironwood Avenue – Heacock Street to Perris Boulevard
  - Kitching Street – South of Krameria Street
  - Krameria Street – Perris Boulevard to Emma Lane
  - Nason Street – Retail Driveway to Fir Avenue
  - Old Lake Drive – Pigeon Pass Road to Sunnymead Ranch Parkway
  - Reche Canyon Road – North of Reche Vista Drive
  - Sunnymead Ranch Parkway – Old Lake Drive to Village Drive
  - Sunnymead Ranch Parkway – Old Country Road to Perris Boulevard

The 2021 GPU Noise Element includes measures to reduce vehicle noise. Policy N.1-1 of the 2021 GPU seeks to protect existing uses from exposure to excessive noise adjacent to freeways and major roads, and Action N.1-B calls for the City to study the feasibility of using alternative pavement materials, such as rubberized asphalt pavements on roadways to reduce noise generation. The City is currently using rubberized asphalt pavement in some locations within the Planning Area. These measures would help minimize the increase in ambient traffic noise described above. However, the increase in ambient noise levels adjacent to the roadway segments listed above would likely remain at levels that would expose existing noise-sensitive receptors to a significant increase in ambient noise levels, and impacts would be significant.

Land Use Compatibility

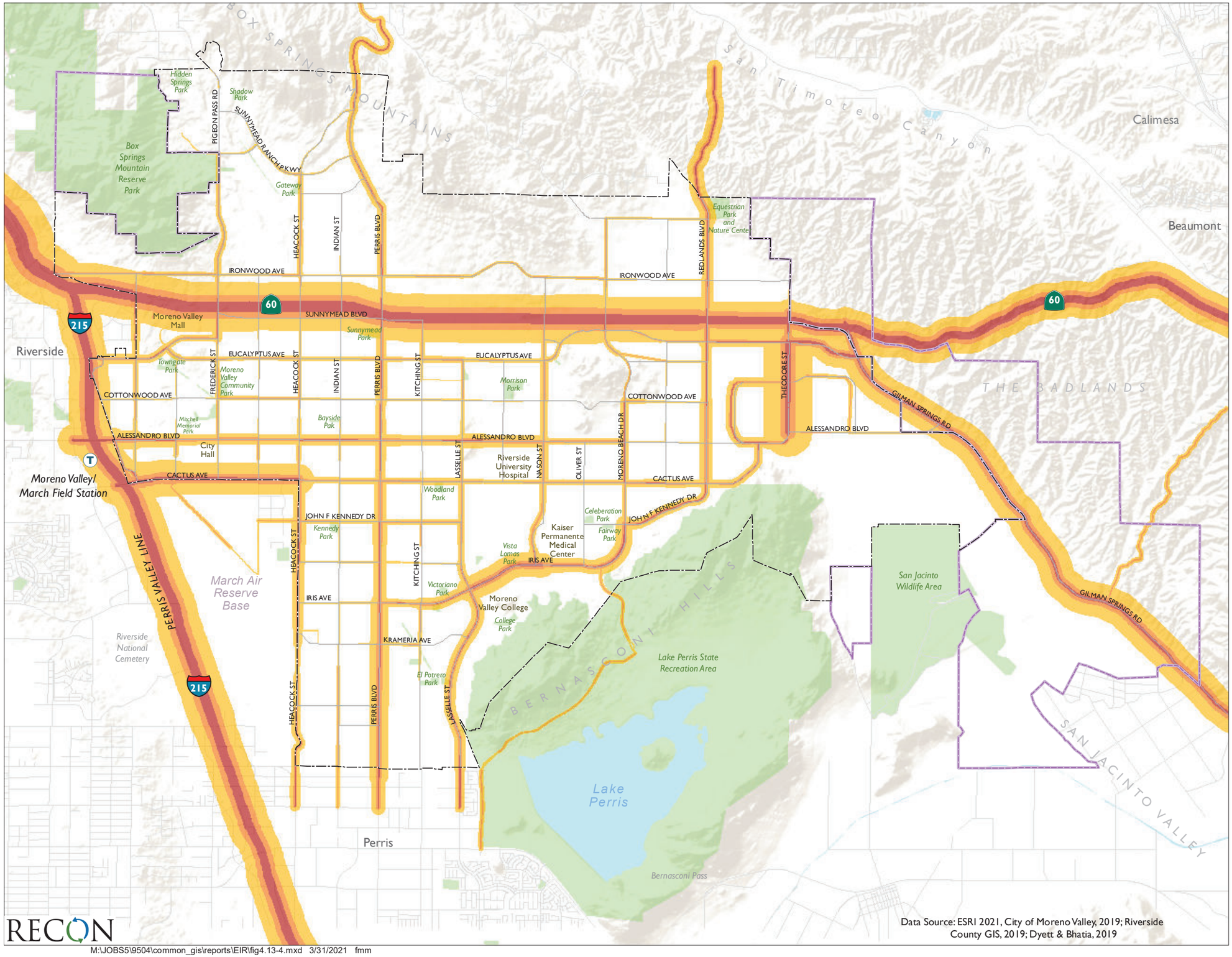
Future vehicle traffic noise contours are shown in Figure 4.13-4. A significant impact would occur if implementation of the project resulted in an exposure of people to current or future motor vehicle traffic noise levels that exceed standards established in the 2021 GPU Noise Element (see Table 4.13-9). The 2021 GPU land use plan proposes a variety of land uses, including residential; commercial, office, industrial, public, and parks. Most of the land use designations included in the 2021 GPU have been carried forward from the existing 2006 General Plan. The project primarily focuses future development and redevelopment within proposed Concept Areas. Portions of the Planning Area located outside of these proposed Concept Areas would retain the current land use designations established under the existing 2006 General Plan. Noise-sensitive uses that are developed near higher-volume roadways could experience noise levels in excess of the proposed 2021 GPU noise standards. The following is a discussion of the land use noise compatibility in each of the Concept Areas.

Downtown Center. The Downtown Center Concept Area would be located in the central portion of the city, bordered by Cottonwood Avenue to the north, Iris Avenue to the south, Lasselle Street to the west, and Oliver Street to the east. The Downtown Center designation would allow for a mix of business, entertainment, residential, cultural, and civic uses. The Downtown Center also encompass the two major medical centers in the Planning Area. Residential uses are "normally acceptable" with noise levels up to 65 CNEL and "conditionally acceptable" with noise levels up 70 CNEL. Office buildings, business commercial, and professional uses are "normally acceptable" with noise levels up to 70 CNEL and "conditionally acceptable" with noise levels up to between 75 and 80 CNEL.

Future vehicle traffic noise levels at the Downtown Center would range from less than 60 CNEL to 70 CNEL. Noise compatibility impacts at the commercial uses within the Downtown Center Concept Area would be less than significant; however, impacts at proposed residential uses would be potentially significant.

Community Centers. Two Community Center Concept Areas are proposed in the western portion of the city at the existing Moreno Valley Mall and The District shopping centers. The Moreno Valley Mall is generally bounded by SR-60 to the north, Towngate Boulevard to the south, Frederick Street to the east, and Day Street to the west. The District Community Center is generally bounded by Ironwood Avenue to the north, Hemlock Avenue and SR-60 to the south, Indian Street to the east, and Heacock Street to the west. The Center Mixed Use (CEMU) designation would allow for pedestrian-oriented places with a mix of uses including retail, dining, entertainment, offices, lodging, recreational and cultural facilities along with higher-density residential uses. Residential and lodging uses are "normally acceptable" with noise levels up to 65 CNEL and "conditionally acceptable" with noise levels up 70 CNEL.

Future vehicle traffic noise levels at the Moreno Valley Mall Concept Area would range from 60 to 75 CNEL. Noise compatibility impacts at residential uses within the Moreno Valley Mall Concept Area would be potentially significant.



City of Moreno Valley

Sphere of Influence

Future Noise Contours

65 to 70 CNEL

70 to 75 CNEL

> 75 CNEL

0 Miles 1

Data Source: ESRI 2021, City of Moreno Valley, 2019; Riverside County GIS, 2019; Dyett & Bhatia, 2019

RECON

M:\JOBS5\9504\common_gis\reports\EIR\fig4.13-4.mxd 3/31/2021 fmm

FIGURE 4.13-4

Future (2040) Vehicle Traffic Noise Contours

Future vehicle traffic noise levels at The District Concept Area would mostly range from 65 to 75 CNEL, and uses located closest to SR-60 could be exposed to noise levels over 75 CNEL. Noise levels would not exceed 80 CNEL. Noise compatibility impacts at residential uses within The District Concept Area would be potentially significant.

The project would also change the land use designation of the parcels adjacent to The District Concept Area to Business Park/Light Industrial. Industrial uses are "normally acceptable" with noise levels up to 75 CNEL and "conditionally acceptable" with noise levels up 80 CNEL. Future vehicle traffic noise levels in this area would range from 60 to 70 CNEL. Noise compatibility impacts at the Business Park/Light Industrial parcels would be less than significant.

Community Corridors. Community Corridors Concept Areas are proposed along existing major transit corridors of Sunnymead Boulevard, Alessandro Boulevard, Perris Boulevard, and Heacock Street. The COMU designation would promote a mix of residential, commercial, and professional office uses. Residential uses are "normally acceptable" with noise levels up to 65 CNEL and "conditionally acceptable" with noise levels up 70 CNEL. Office buildings, business commercial, and professional uses are "normally acceptable" with noise levels up to 70 CNEL and "conditionally acceptable" with noise levels up to between 75 and 80 CNEL.

Future vehicle traffic noise levels between Sunnymead Boulevard and SR-60 would range from 70 to over 75 CNEL, and noise levels south of Sunnymead Boulevard would range from 65 to 70 CNEL. Future vehicle traffic noise levels adjacent to Alessandro Boulevard, Perris Boulevard, and Heacock Street would range from less than 60 to 70 CNEL. Noise compatibility impacts at the commercial and professional uses within the Community Corridors Concept Area would be less than significant, however, impacts at proposed residential uses would be potentially significant.

Highway Office/Commercial. The Highway Office/Commercial Concept Area is proposed in the northeastern portion of the city, north of SR-60, south of Ironwood Avenue, west of World Logistics Parkway, and east of Moreno Beach Drive. The Highway Office/Commercial Concept Area envisions the creation of an inviting gateway of retail, commercial, office, and other uses (e.g., employment campus; educational campus). Office buildings, business commercial, and professional uses are "normally acceptable" with noise levels up to 70 CNEL and "conditionally acceptable" with noise levels up to between 75 and 80 CNEL.

Future vehicle traffic noise levels in this area would mostly range from 65 to 75 CNEL, and uses located closest to SR-60 could be exposed to noise levels over 75 CNEL. Noise levels would not exceed 80 CNEL. Noise compatibility impacts at the Highway Office/Commercial Concept Area would be potentially significant.

Business Flex. A Business Flex Concept Area is proposed in the western portion of the city, south of SR-60, generally along Alessandro Boulevard, and adjacent to March ARB. The Business Flex concept allows a range of light industrial and commercial businesses consistent with ALUCP regulations. The Business Flex Concept Area would provide for business activities involving production, distribution, or repair with supporting office and commercial

space. Industrial and manufacturing uses are "normally acceptable" with noise levels up to 75 CNEL and "conditionally acceptable" with noise levels up to 80 CNEL.

Future vehicle traffic noise levels in this area would range from 60 to 75 CNEL. Industrial uses would be considered "normally acceptable" in the Business Flex Concept Area. Noise compatibility impacts would be less than significant.

Residential Density Changes. The project includes targeted residential density changes to provide for higher density housing to support the meeting of state obligations under RHNA. Residential uses are "normally acceptable" with noise levels up to 65 CNEL and "conditionally acceptable" with noise levels up 70 CNEL. The residential density change areas are located in the following four general areas:

- Between Sunnymead Boulevard, Cottonwood Avenue, Heacock Street, and Perris Boulevard. Future vehicle traffic noise levels in this area would range from less than 60 CNEL to 70 CNEL. Noise compatibility impacts at proposed residential uses closest to SR-60 would be potentially significant.

- South of Ironwood Avenue and north of SR-60 along Moreno Beach Drive. Future vehicle traffic noise levels in this area would range from less than 60 CNEL to 75 CNEL, and may exceed 75 CNEL at areas closest to SR-60. Noise compatibility impacts at proposed residential uses would be potentially significant.

- The area between Moreno Beach Drive, Eucalyptus Avenue, Quincy Street, and Cottonwood Avenue. Future vehicle traffic noise levels in this area would range from less than 60 CNEL to 65 CNEL. Noise compatibility impacts at proposed residential uses would be less than significant.

- Southwest of the intersection of Krameria Avenue and Perris Boulevard. Future vehicle traffic noise levels in this area would range from 60 CNEL to 75 CNEL. Noise compatibility impacts at proposed residential uses closest to Perris Boulevard would be potentially significant.

2021 GPU Policies N.1-1, N.1-2, N.1-3, N.1-4, N.1-7, N.2-1 intend to reduce transportation-related noise and require developers to reduce noise impacts on new development through appropriate means including double-paned or soundproof windows, setbacks, berming, and screening. Future discretionary proposals within the Planning Area would be required to conduct site-specific exterior noise analyses to demonstrate that the proposed development would not place sensitive receptors in locations where the exterior existing or future noise levels would exceed the land use compatibility standards. Additionally, all future development located in areas where exterior noise levels exceed the land use compatibility standards as defined in the 2021 GPU Noise Element, site-specific interior noise analyses demonstrating compliance with the interior noise standards of Title 24 and the 2021 GPU would be required. These requirements for site-specific noise analyses would be implemented through submission of a Title 24 Compliance Report to demonstrate interior noise levels of 45 CNEL. Through implementation of this regulatory framework, exterior and interior traffic noise impacts associated with new development would be less than significant.

b. Railroad Noise

At the closest distance, the Planning Area boundary is located approximately 200 feet from the railroad tracks of the San Jacinto Branch Line that closely follows the I-215 corridor. Using the parameters discussed in Section 4.13.3.2, the noise level at 200 feet as well as the noise contour distances were calculated. The results are summarized in Table 4.13-13.

Table 4.13-13
Railroad Noise Contour Distances

Station	Noise Level at 200 feet (CNEL)	Distance to Noise Contour (feet)		
		70 CNEL	65 CNEL	60 CNEL
Moreno Valley/March Field	58	15	40	130

CNEL = community noise equivalent level

As shown in Table 4.13-13, railroad noise levels within the Planning Area are not projected to exceed 60 CNEL. It should also be noted that because the railroad tracks parallel the I-215 corridor and I-215 lies between the railroad tracks and the Planning Area in most locations, noise levels at the western boundary of the Planning Area are significantly dominated by vehicle traffic on I-215. Therefore, while the trains may be audible while they are passing by, they do not contribute to the overall ambient noise levels adjacent to the I-215 corridor, and railroad noise impacts would be less than significant.

c. Stationary Noise

A significant impact would occur if implementation of the project resulted in the exposure of people to noise levels that exceed property line limits established in Municipal Code under Title 11 Peace, Morals and Safety, Chapter 11.80, Noise Regulation. Stationary sources of noise include activities associated with a given land use. For example, noise sources from commercial land uses would include car washes, fast food restaurants, auto repair facilities, parking lots, and a variety of other uses. Noise generated by residential or commercial uses is generally short-lived and intermittent, while noise generated by auto-oriented commercial and industrial uses is usually sporadic, highly variable, and spatially distributed. Noise sources from industrial uses would include mechanical equipment, generators, and trucks. Industrial uses are largely concentrated in the southwest of the city, adjacent to MARB and I-215. Additionally, significant light industrial uses have been approved at the World Logistics Center site at the eastern edge of the city. While industrial uses are generally concentrated at the periphery of the city, the potential for noise conflicts exists where these uses would abut residential areas. Additionally, potential noise conflicts could occur in mixed-use areas where residential uses are located in close proximity to commercial and retail uses.

The type of land uses proposed under the 2021 GPU would be similar to the land uses that currently exist in the Planning Area. Although the 2021 GPU would introduce five new land use designations, the allowed uses would be similar to what currently exists within the Planning Area. The 2021 GPU would primarily focus future development and redevelopment within the proposed Concept Areas that consist of clusters of vacant and underutilized land within the city limit that would increase density along existing corridors. Noise levels within

the Planning Area are currently dominated by vehicle traffic on freeways and heavily traveled area roadways, and would continue to be the primary source of noise under project buildout. Therefore, future noise levels from stationary sources throughout the Planning Area would not be expected to increase the hourly or daily average sound level with respect to current conditions. While noise-sensitive residential land uses would be exposed to noise associated with the operation of commercial and industrial uses, future development would be required to show compliance with the Noise Regulation of the Municipal Code. As detailed in Section 4.13.2.4, the City regulates specific noise level limits allowable between land uses including limits on hours of operation for various noise-generating activities, guidance for measuring potential noise violations, and violation procedures. Additionally, 2021 GPU Policy N.2-2 and Actions N.2-A and N.2-B state that the City will continue to work with the community to address noise complaints through enforcement of Municipal Code provisions, and to update the Municipal Code to establish controls on outdoor noise in public places. Through enforcement of the Noise Regulation of the Municipal Code and 2021 GPU policies and actions would ensure that future development would not result in a substantial permanent increase in ambient noise levels, and impacts would be less than significant.

d. Construction Noise

Future development implemented under the project could result in a temporary ambient noise increase due to construction activities. Due to the developed nature of the Planning Area, there is a high likelihood that construction activities would take place adjacent to existing structures and that sensitive receptors would be located in proximity to construction activities.

Construction noise typically occurs intermittently and varies depending upon the nature or phase of construction (e.g., demolition; land clearing, grading, and excavation; erection). Construction noise would be short term and would include noise from activities such as site preparation, truck hauling of material, pouring of concrete, and the use of power tools. Noise would also be generated by construction equipment use, including earthmovers, material handlers, and portable generators, and could reach high noise levels for brief periods.

As discussed in Section 4.13.3.4 above, hourly average noise levels would be approximately 83 dB(A) L_{eq} at 50 feet from the center of construction activity when assessing three pieces of common construction equipment working simultaneously. Noise levels would vary depending on the nature of the construction activities including the duration of specific activities, the equipment involved, the location of the sensitive receivers, and the presence of intervening barriers. Construction noise levels of 83 dB(A) L_{eq} at 50 feet would attenuate to 80 dB(A) L_{eq} at 70 feet. Therefore, significant impacts would occur if sensitive land uses are located closer than 70 feet of construction activities.

The City regulates construction noise through Sections 8.14.040(E) and 11.80.030(D)(7) of the Municipal Code by limiting construction activities to 7:00 a.m. to 7:00 p.m. from Monday through Friday excluding holidays and from 8:00 a.m. to 4:00 p.m. on Saturdays. 2021 GPU Policy N.2-3 would also require the enforcement of the regulations in the Municipal Code to reduce potential construction noise impacts. However, construction activities associated with

any individual development may occur near noise-sensitive receptors. Depending on the project type, equipment list, time of day, phasing, and overall construction durations, noise disturbances may occur for prolonged periods of time or during the more sensitive nighttime hours. Therefore, construction noise impacts would be considered potentially significant.

4.13.5.2 Topic 2: Vibration

Would the project generate excessive groundborne vibration or groundborne noise levels?

a. Construction

Construction activities may include demolition of existing structures, site preparation work, excavation of parking and subfloors, foundation work, and building construction. Demolition for an individual site may last several weeks to months and may produce substantial vibration. Excavation for underground levels could also occur on some development sites, and vibratory pile driving could be used to stabilize the walls of excavated areas. Piles or drilled caissons may also be used to support building foundations.

As with any type of construction, vibration levels during any phase may at times be perceptible. However, non-pile driving or foundation work construction phases that have the highest potential of producing vibration (such as jackhammering and other high power tools) would be intermittent and would only occur for short periods of time for any individual development site. By use of administrative controls, such as scheduling construction activities with the highest potential to produce perceptible vibration to hours with least potential to affect nearby properties, perceptible vibration can be kept to a minimum and as such would result in a less than significant impact with respect to perception.

Pile driving has the potential to generate the highest groundborne vibration levels and is the primary concern for structural damage when it occurs within close proximity of structures. As shown in Table 4.13-11, vibration generated by construction equipment has the potential to be substantial, since it has the potential to exceed the FTA criteria for architectural damage (e.g., 0.12 PPV for fragile or historical resources, 0.2 PPV for non-engineered timber and masonry buildings, and 0.3 PPV for engineered concrete and masonry). Construction details and equipment for future project-level development is not known at this time. Therefore, construction vibration impacts would be considered potentially significant.

b. Railroad

As discussed in Section 4.13.1.5 above, the San Jacinto Branch Line closely follows the I-215 corridor, bordering the western edge of the city. Both the Metrolink commuter rail and freight trains travel along the corridor. Vibration impacts due to the proximity of land uses to the rail corridor were analyzed using the FTA criteria shown in Table 4.13-5 and recommended screening distances.

For Category 1 uses such as vibration sensitive equipment, the screening distance from the right-of-way is 600 feet. These uses include research and manufacturing facilities with special vibration constraints. The 600-foot buffer from the railroad tracks slightly cross into

the Planning Area at the two westernmost point of the City limits where Eucalyptus Road and Box Springs Road intersect with I-215. The land uses within this 600-foot buffer mostly include right-of-way and very small portions of residential land uses. No Category 1 land uses would be constructed within 600 feet of the railroad tracks. For Category 2 land uses such as residences and buildings where people would normally sleep, the screening distance is 200 feet. The screening distance for Category 3 land uses such as institutional land uses with primarily daytime uses, is 120 feet. The Planning Area boundaries are more than 200 feet from the railroad tracks. Therefore, vibration impacts due to railroad activity would be less than significant.

c. Stationary Sources

Industrial manufacturing operations occasionally utilize equipment or processes that have a potential to generate groundborne vibration. However, vibrations found to be excessive for human exposure that are the result of industrial machinery are generally addressed from an occupational health and safety perspective. The residual vibrations are typically of such low amplitude that they quickly dissipate into the surrounding soil and are rarely perceivable at the surrounding land uses. Residential and commercial uses do not typically generate vibration. Therefore, vibration impacts associated with stationary sources would be less than significant.

4.13.5.3 Topic 3: Airports

Would the project expose people residing or working in the project area to excessive aircraft noise levels?

As discussed in Section 4.13.1.4 above, the MARB is a joint-use civilian and military facility located southwest of the Planning Area. As shown in Figure 4.9-2 in Section 4.9, Hazards and Hazardous Materials, portions of the Planning Area are located within the airport compatibility zones B1-APZ II, C1, and D. The MARB noise contours in relation to the Planning Area are shown in Figure 4.13-3. Compatibility zone B1 is within or near the 65 CNEL contour, and compatibility zone C1 is within or near the 60 CNEL contour.

As discussed in Section 4.13.2.3 above, the noise level considered normally acceptable for new residential land uses is 65 CNEL. The ALUCP also indicates that the maximum acceptable interior noise level is 40 CNEL for noise-sensitive land uses (residences, schools, libraries, museums, hotels and motels, hospitals and nursing homes, places of worship, etc.) and 45 CNEL for office uses. The ALUCP requires that an acoustical study be complete for new noise-sensitive land uses that are located within the 60 CNEL contour.

The 65 CNEL noise contour crosses into the City in two locations identified as compatibility zone B1: the southwestern corner of the City west of Indian Street and south of San Michele Road, and the western edge of the City near the intersection of Old 215 Frontage Road and Alessandro Boulevard. The proposed land use designations in these areas are Business Park/Light Industrial, Business Flex, Commercial, and Open Space. No residential land uses are located in areas where MARB noise levels exceed 65 CNEL. The 60 CNEL contour crosses into the western portion of the City in locations identified as compatibility zone C1. The land

use proposed designations in these areas include those identified above as well as R3 Residential.

The land use restrictions for each of the compatibility zones provides limitations to development to minimize potential hazards including noise exposure. Development within the Air Installation Compatible Use Zone is subject to development standards and restrictions as set forth in Municipal Code Section 9.07.060. Future development that would be located within the city's special zone and/or within the ALUC compatibility zones would be required to adhere to all special regulations, including Municipal Code development standards and specific land use regulations regarding aircraft noise. 2021 GPU Policies N.1-3, N.2-4, and N.2-5 and Action N.1-A also reinforce the standards contained in the ALUCP. Therefore, adherence with the noise requirements of the ALUCP, the Municipal Code, and associated FAA requirements would ensure that future development would not expose people to excessive aircraft noise levels, and impacts would be less than significant.

4.13.6 Cumulative Analysis

The analysis of vehicle traffic noise provided above is cumulative in nature because the analysis considers noise impacts associated with buildout of the entirety of the Planning Area and the traffic assumptions used in the analysis include cumulative traffic associated with regional growth. Cumulatively, there would be a substantial amount of additional new future development and associated travel demand within the Planning Area and in the surrounding region. The residences and other sensitive land uses located along most of the Planning Area roadways are currently affected by the existing traffic noise, and cumulative growth would result in a significant increase in ambient noise and would potentially result in noise levels that exceed the City's compatibility standards. Therefore, noise impacts associated with ambient noise increases and land use compatibility would be cumulatively considerable and would remain significant and unavoidable.

Stationary source of noise, construction noise, and vibration are generally localized impacts that do not have regional or cumulative considerations. Noise sources associated with past, present, and future development in the region include construction equipment, landscape and building maintenance activities, mechanical equipment, solid waste collection, parking lots, commercial, office, and industrial activities, and residential, school, and recreation activities and events. Noise sources that are adjacent to one another could combine to increase cumulative noise levels. However, stationary noise sources within the Planning Area would not generally combine with noise sources outside the Planning Area to create a cumulative increase in stationary noise. Through enforcement of the Municipal Code, cumulative noise and vibration impacts associated with stationary sources would be less than significant. However, noise and vibration impacts associated with construction activities would be potentially cumulatively significant.

4.13.7 Significance of Impacts before Mitigation

4.13.5.1 Topic 1: Increase in Ambient Noise

a. Traffic Noise

Increase in Ambient Noise

The increase in ambient noise levels adjacent to roadway segments listed in Section 4.13.5.1 would expose existing noise-sensitive receptors to a significant increase in ambient noise levels, and impacts would be significant.

Land Use Compatibility

Future development proposals within the Planning Area would be required to conduct site-specific exterior and interior noise analyses to demonstrate that the proposed development would not place sensitive receptors in locations where the existing or future noise levels would exceed the land use compatibility standards. Impacts associated with future development would be less than significant.

b. Railroad Noise

Railroad noise levels would not exceed 60 CNEL within the Planning Area, and impacts would be less than significant.

c. Stationary Noise

Through enforcement of the Noise Regulation of the Municipal Code and 2021 GPU policies and actions, impacts associated with stationary sources of noise would be less than significant.

d. Construction Noise

Construction activities associated with any individual development may occur near noise-sensitive receptors and noise disturbances may occur. Therefore, construction noise impacts would be considered potentially significant.

4.13.5.2 Topic 2: Vibration

Construction details, locations, and equipment for future project-level developments under the 2021 GPU are not known at this time but may cause vibration impacts. Therefore, construction vibration impacts would be considered potentially significant.

Vibration impacts due to railroad activities and stationary source would be less than significant.

4.13.5.3 Topic 3: Airports

Adherence with the noise requirements of the ALUCP, the Municipal Code, and associated FAA requirements would ensure that future development would not expose people to excessive aircraft noise levels, and impacts would be less than significant.

4.13.8 Mitigation

4.13.8.1 Topic 1: Increase in Ambient Noise

a. Traffic Noise

Impacts associated with the increase in ambient noise and land use compatibility would be significant without mitigation. For existing noise sensitive land uses, possible noise-reduction measures would include retrofitting older structures with acoustically rated windows and doors featuring higher Sound Transmission Class ratings, which is a measure of exterior noise reduction performance. However, there is no mechanism in place for implementing such a retrofit program. Because the significant noise impacts would be to existing homes and other noise-sensitive uses in an already urbanized area, there is no feasible mitigation. Therefore, impacts to existing sensitive land uses would remain significant and unavoidable.

b. Railroad Noise

Impacts would be less than significant. No mitigation is required.

c. Stationary Noise

Impacts would be less than significant. No mitigation is required.

d. Construction Noise

Impacts related to construction noise would be significant and the following mitigation shall be applied to future development:

NOS-1: The Director of Community Development or his or her designee shall require applicants to demonstrate whether the project has the potential to exceed noise standards contained in Sections 8.14.040(E) and 11.80.030(D)(7) of the Municipal Code. If a project may exceed standards or is located adjacent to sensitive receptors, the City may require the applicant to prepare a Noise Analysis that estimates construction noise and identifies noise reduction measures that would ensure compliance with Municipal Code standards. Construction plans submitted to the City shall identify applicable measures on demolition, grading, and construction plans submitted to the City. Noise reduction measures can include, but are not limited to, the following:

1. Demolition, construction, site preparation, and related activities that would generate noise perceptible at the property line of the subject property are limited to the hours between 7:00 a.m. to 7:00 p.m. from Monday through Friday excluding holidays and from 8:00 a.m. to 4:00 p.m. on Saturdays. The building inspector may issue an exception to this limitation on hours in cases of urgent necessity where the public health and safety will not be substantially impaired.

2. Idling times for noise-generating equipment used in demolition, construction, site preparation, and related activities shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes.

3. Demolition, construction, site preparation, and related activities within 70 feet from the edge of properties with existing, occupied noise-sensitive uses shall incorporate all feasible strategies to reduce noise exposure for noise-sensitive uses, including:

    a. Provide written notice to all known occupied noise-sensitive uses within 400 feet of the edge of the project site boundary at least 2 weeks prior to the start of each construction phase of the construction schedule;

    b. Ensure that construction equipment is properly maintained and equipped with noise control components, such as mufflers, in accordance with manufacturers' specifications;

    c. Re-route construction equipment away from adjacent noise-sensitive uses;

    d. Locate noisy construction equipment away from surrounding noise-sensitive uses;

    e. Use sound aprons or temporary noise enclosures around noise-generating equipment;

    f. Position storage of waste materials, earth, and other supplies in a manner that will function as a noise barrier for surrounding noise-sensitive uses;

    g. Use the quietest practical type of equipment;

    h. Use electric powered equipment instead of diesel or gasoline engine powered equipment; Use shrouding or shielding and intake and exhaust silencers/mufflers; and

    i. Other effective and feasible strategies to reduce construction noise exposure for surrounding noise-sensitive uses.

4. For construction of buildings that require the installation of piles, an alternative to installation of piles by hammering shall be used. This could

include the use of augured holes for cast-in-place piles, installation through vibration or hydraulic insertion, or another low-noise technique.

4.13.8.2 Topic 2: Vibration

a. Construction

Impacts related to construction vibration would be significant and the following mitigation shall be applied to future development:

NOS-2: Prior to issuance of a building permit for a project requiring pile driving during construction within 135 feet of fragile structures, such as historical resources, 100 feet of non-engineered timber and masonry buildings (e.g., most residential buildings), or within 75 feet of engineered concrete and masonry (no plaster); or a vibratory roller within 25 feet of any structure, the project applicant shall prepare a noise and vibration analysis to assess and mitigate potential noise and vibration impacts related to these activities. This noise and vibration analysis shall be conducted by a qualified and experienced acoustical consultant or engineer. The vibration levels shall not exceed Federal Transit Administration (FTA) architectural damage thresholds (e.g., 0.12 inches per second [in/sec] peak particle velocity [PPV] for fragile or historical resources, 0.2 in/sec PPV for non-engineered timber and masonry buildings, and 0.3 in/sec PPV for engineered concrete and masonry). If vibration levels would exceed this threshold, alternative uses such as drilling piles as opposed to pile driving and static rollers as opposed to vibratory rollers shall be used. If necessary, construction vibration monitoring shall be conducted to ensure vibration thresholds are not exceeded.

b. Railroad

Impacts would be less than significant. No mitigation is required.

c. Stationary Sources

Impacts would be less than significant. No mitigation is required.

4.13.8.3 Topic 3: Airports

Impacts would be less than significant. No mitigation is required.

4.13.9 Significance of Impacts after Mitigation

4.13.5.1 Topic 1: Increase in Ambient Noise

a. Traffic Noise

Impacts to existing sensitive land uses located in areas that would experience a significant increase in ambient noise levels exceeding the applicable land use and noise compatibility level would be significant and unavoidable at this program level of review.

b. Railroad Noise

Impacts would be less than significant. No mitigation is required.

c. Stationary Noise

Impacts would be less than significant. No mitigation is required.

d. Construction Noise

Mitigation Measure NOS-1 would reduce construction noise exposure. However, for construction sites that are adjacent to noise-sensitive uses, there still could be a substantial temporary increase in noise levels that could lead to adverse noise-related impacts. Therefore, impacts would remain significant and unavoidable.

4.13.5.2 Topic 2: Vibration

a. Construction

Mitigation Measure NOS-2 would reduce construction-related vibration impacts to a level less than significant.

b. Railroad

Impacts would be less than significant. No mitigation is required.

c. Stationary Sources

Impacts would be less than significant. No mitigation is required.

4.13.5.3 Topic 3: Airports

Impacts would be less than significant. No mitigation is required.