This section provides a general description of the existing noise sources in the Project vicinity, a discussion of the regulatory setting, and identifies potential noise impacts associated with the Project. Project impacts are evaluated relative to applicable noise level criteria and to the existing ambient noise environment. Mitigation measures have been identified for significant noise-related impacts.

The Cordova Recreation & Park District submitted a comment the public review period for the Notice of Preparation on August 3, 2018. The comment related to noise is addressed within this section.

3.10.1 ENVIRONMENTAL SETTING

KEY TERMS

Acoustics	The science of sound.
Ambient Noise	The distinctive acoustical characteristics of a given area consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
Attenuation	The reduction of noise.
A-Weighting	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
Decibel or dB	Fundamental unit of sound, defined as ten times the logarithm of the ratio of the sound pressure squared over the reference pressure squared.
CNEL	Community noise equivalent level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.
Frequency	The measure of the rapidity of alterations of a periodic acoustic signal, expressed in cycles per second or Hertz.
Impulsive	Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.
L_{dn}	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
L_{eq}	Equivalent or energy-averaged sound level.
L_{max}	The highest root-mean-square (RMS) sound level measured over a given period of time.
$L_{(n)}$	The sound level exceeded a described percentile over a measurement period. For instance, an hourly L_{50} is the sound level exceeded 50 percent of the time during the one-hour period.
Loudness	A subjective term for the sensation of the magnitude of sound.
Noise	Unwanted sound.
SEL	Sound exposure levels. A rating, in decibels, of a discrete event, such as an aircraft flyover or train passby, that compresses the total sound energy into a one-second event.

FUNDAMENTALS OF ACOUSTICS

Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If the pressure variations occur frequently enough (at least 20 times per second), then they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second or Hertz (Hz).

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals), as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels (dB) correspond closely to human perception of relative loudness.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels, but are expressed as dB, unless otherwise noted.

The decibel scale is logarithmic, not linear. In other words, two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70-dBA sound is half as loud as an 80-dBA sound, and twice as loud as a 60-dBA sound.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (L_{eq}), which corresponds to a steady-state A weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The L_{eq} is the foundation of the composite noise descriptor, L_{dn}, and shows very good correlation with community response to noise.

The day/night average level (L_{dn}) is based upon the average noise level over a 24-hour day, with a +10 decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, it tends to disguise short-term variations in the noise environment. CNEL is similar to L_{dn}, but includes

a +5-dB penalty for evening noise. Table 3.10-1 lists several examples of the noise levels associated with common situations.

TABLE 3.10-1: TYPICAL NOISE LEVELS

COMMON OUTDOOR ACTIVITIES	*NOISE LEVEL (DBA)*	*COMMON INDOOR ACTIVITIES*
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft)	--100--	
Gas Lawn Mower at 1 m (3 ft)	--90--	
Diesel Truck at 15 m (50 ft), at 80 km/hr (50 mph)	--80--	Food Blender at 1 m (3 ft) Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft)	--70--	Vacuum Cleaner at 3 m (10 ft)
Commercial Area Heavy Traffic at 90 m (300 ft)	--60--	Normal Speech at 1 m (3 ft)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

SOURCE: CALTRANS, TECHNICAL NOISE SUPPLEMENT, TRAFFIC NOISE ANALYSIS PROTOCOL. SEPTEMBER 2013.

EFFECTS OF NOISE ON PEOPLE

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction;
- Interference with activities such as speech, sleep, and learning; and
- Physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a 1 dBA change cannot be perceived;
- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference;
- A change in level of at least 5-dBA is required before any noticeable change in human response would be expected; and

- A 10-dBA change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

Stationary point sources of noise – including stationary mobile sources such as idling vehicles – attenuate (lessen) at a rate of approximately 6 dB per doubling of distance from the source, depending on environmental conditions (i.e. atmospheric conditions and either vegetative or manufactured noise barriers, etc.). Widely distributed noises, such as a large industrial facility spread over many acres, or a street with moving vehicles, would typically attenuate at a lower rate.

EXISTING NOISE AND VIBRATION ENVIRONMENTS

Existing and Surrounding Land Uses

North: The Sunridge Park Village residential area is located directly north of the Project site, south of Douglas Road and east of Sunrise Boulevard. A mix of industrial uses and additional residential communities are located north of Douglas Road.

East: The land directly to the east of the Project site is vacant.

South: The land directly to the south of the Project site is vacant.

West: The Anatolia and Anatolia Village residential areas are located directly to the west of the Project site. Another residential community is also under construction along with Rancho Cordova Parkway, which is being extended from Douglas Road to Chrysanthy Boulevard.

Existing Ambient Noise Levels

To quantify the existing ambient noise environment in the Project vicinity, short-term and continuous (24-hour) noise level measurements were conducted on the Project site on August 28th and 29th, 2018. The noise measurement locations are shown on Figure 3.10-1. The noise level measurement survey results are provided in Table 3.10-2. Appendix A of Appendix H shows the complete results of the noise monitoring survey.

TABLE 3.10-2: SUMMARY OF EXISTING BACKGROUND NOISE MEASUREMENT DATA

SITE	*LOCATION*	*DATE/TIME*	L_{DN}	*AVERAGE MEASURED HOURLY NOISE LEVELS, DB*					
				DAYTIME (7AM-10PM)			*NIGHTTIME (10PM-7AM)*		
				L_{EQ}	L_{50}	L_{MAX}	L_{EQ}	L_{50}	L_{MAX}
Continuous (24-hour) Noise Level Measurements									
LT-1	31 ft. from centerline of Rancho Cordova Pkwy.	08/28/18 - 08/29/18	52	51	40	72	44	34	63
LT-2	North boundary of Project site, behind 12368 Pawcatuk Way	08/28/18 – 08/29/18	45	44	37	61	38	35	50
Short-Term Noise Level Measurements									
ST-1	140 ft. from centerline of Rancho Cordova Pkwy.	08/28/18 10:58 AM	NA	53	49	64	Construction to west is primary noise source.		

SOURCE: SAXELBY ACOUSTICS, 2019.

The sound level meters were programmed to collect hourly noise level intervals at each site during the survey. The maximum value (L_{max}) represents the highest noise level measured during an interval. The average value (L_{eq}) represents the energy average of all of the noise measured during an interval. The median value (L_{50}) represents the sound level exceeded 50 percent of the time during an interval.

Larson Davis Laboratories (LDL) Model 820, Model 812, and Model 831 precision integrating sound level meters were used for the ambient noise level measurement survey. The meters were calibrated before and after use with an LDL Model CAL200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all pertinent specifications of the American National Standards Institute for Type 1 sound level meters (ANSI S1.4).

Existing Traffic Noise Environment at Off-Site Receptors

To predict existing noise levels due to traffic, the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA RD-77-108) was used. The model is based upon the Calveno reference noise emission factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA model was developed to predict hourly L_{eq} values for free-flowing traffic conditions.

Traffic volumes for existing conditions were obtained from the traffic data prepared for the Project (Kimley-Horn, 2018). Truck percentages and vehicle speeds on the local area roadways were estimated from field observations.

Traffic noise levels are predicted at the sensitive receptors located at the closest typical setback distance along each Project-area roadway segment. Where traffic noise barriers are predominately along a roadway segment, a -5 dB offset was included in the noise prediction model to account for various noise barrier heights. A -5 dB offset was also applied where outdoor activity areas are shielded by intervening buildings. In some locations, sensitive receptors may be located at distances which vary from the assumed calculation distance and may experience shielding from intervening barriers or sound walls. However, the traffic noise analysis is believed to be representative of the majority of sensitive receptors located closest to the Project-area roadway segments analyzed in this report.

Table 3.10-3 shows the existing traffic noise levels in terms of L_{dn} at closest sensitive receptors along each roadway segment. A complete listing of the FHWA Model input data is contained in Appendix B of Appendix H.

TABLE 3.10-3: EXISTING TRAFFIC NOISE LEVELS

ROADWAY	*SEGMENT*	*EXTERIOR TRAFFIC NOISE LEVEL, DB L_{DN}*
Jackson Rd.	Bradshaw Rd. to Excelsior Rd.	67.4
Jackson Rd.	Excelsior Rd. to Eagles Nest Rd.	67.1
Jackson Rd.	Eagles Nest Rd. to Sunrise Blvd.	66.1
Jackson Rd.	Sunrise Blvd. to Grant Line Rd.	67.1
Excelsior Rd.	Kiefer Blvd. to Jackson Rd.	60.0
Kiefer Blvd.	Grant Line Rd. to Jackson Rd./SR-16	55.1
International Dr.	Zinfandel Dr. to Sunrise Blvd.	65.2
Mather Blvd.	Femoyer St. to Douglas Rd.	58.1
Douglas Rd.	Mather Blvd. to Sunrise Blvd.	66.3
Douglas Rd.	Sunrise Blvd. to Grant Line Rd.	61.0
White Rock Rd.	Zinfandel Dr. to Sunrise Blvd.	65.3
White Rock Rd.	Sunrise Blvd. to Grant Line Rd.	60.9
White Rock Rd.	Grant Line Rd. to Prairie City Rd.	67.3
Mather Field Rd.	Folsom Blvd. to US 50 WB Ramp	65.7
Mather Field Rd.	US 50 WB Ramp to US 50 EB Ramp	68.7
Mather Field Rd.	US 50 to International Dr.	69.5
Zinfandel Dr.	Folsom Blvd. to US 50 WB	57.0
Zinfandel Dr.	US 50 to White Rock Rd.	66.6
Zinfandel Dr.	White Rock Rd. to International Rd.	65.8
Zinfandel Dr.	International Rd. to Douglas Rd.	59.6
Sunrise Blvd.	US 50 WB Ramp to US 50 EB Ramp	64.3
Sunrise Blvd.	US 50 to Folsom Blvd.	67.1
Sunrise Blvd.	Folsom Blvd. to White Rock Rd.	69.4
Sunrise Blvd.	White Rock Rd. to Douglas Rd.	69.3
Sunrise Blvd.	Douglas Rd. to Jackson Rd.	64.6
Sunrise Blvd.	Jackson Rd. to Grant Line Rd.	66.8
Grant Line Rd.	White Rock Rd. to Douglas Rd.	69.8
Grant Line Rd.	Douglas Rd. to Jackson Rd.	64.7
Grant Line Rd.	Jackson Rd. to Sunrise Blvd.	64.3

SOURCE: FHWA-RD-77-108 WITH INPUTS FROM KIMLEY HORN AND SAXELBY ACOUSTICS. 2019.

3.10.2 REGULATORY SETTING

FEDERAL

There are no federal regulations related to noise that apply to the Project.

STATE

California Environmental Quality Act

The California Environmental Quality Act (CEQA) Guidelines, Appendix G, indicate that a significant noise impact may occur if a project exposes persons to noise or vibration levels in excess of local general plans or noise ordinance standards, or cause a substantial permanent or temporary increase in ambient noise levels. CEQA standards are discussed more below under the Thresholds of Significance section.

California State Building Code

The State Building Code, Title 24, Part 2 of the State of California Code of Regulations establishes uniform minimum noise insulation performance standards to protect persons within new buildings which house people, including hotels, motels, dormitories, apartment houses and dwellings other than single-family dwellings. Title 24 mandates that interior noise levels attributable to exterior sources shall not exceed 45 dB L_{dn} or CNEL in any habitable room.

Title 24 also mandates that for structures containing noise-sensitive uses to be located where the L_{dn} or CNEL exceeds 60 dB, an acoustical analysis must be prepared to identify mechanisms for limiting exterior noise to the prescribed allowable interior levels. If the interior allowable noise levels are met by requiring that windows be kept closed, the design for the structure must also specify a ventilation or air conditioning system to provide a habitable interior environment

Rancho Cordova General Plan

The Rancho Cordova General Plan Noise Element includes the following goals, policies, and actions regarding noise that are applicable to the Project:

NOISE ELEMENT - GOALS AND POLICIES

Goal N-1: Ensure that all new development will be free of noise disturbances.

Policy N-1.1: Establish standards and policies consistent with those in Tables N-1 and N-2 to govern maximum sound levels in new development.

Policy N-1.2: Ensure that the indoor and outdoor areas of new projects will be located, constructed, and/or shielded from noise sources in compliance with the City's noise standards to the maximum extent feasible.

Policy N-1.7: To the extent feasible and appropriate, the City shall require the use of temporary construction noise control measures for public and private projects that may include the use of temporary noise barriers, temporary relocation of noise-sensitive land uses or other appropriate measures.

NOISE ELEMENT - NOISE COMPATIBILITY STANDARDS

Table N-1 (Figure 3.10-2) of the General Plan shows the maximum allowable daytime and nighttime noise levels from non-transportation sources. Table N-2 (Figure 3.10-3) gives an overview of maximum interior and exterior traffic noise exposure for land use categories that are applied throughout the City.

FIGURE 3.10-2: GENERAL PLAN TABLE N-1: CITY NOISE STANDARDS – NOISE LEVEL PERFORMANCE STANDARDS FOR NEW PROJECTS AFFECTED BY OR INCLUDING NON-TRANSPORTATION NOISE SOURCES

Stationary Noise Source	Noise Level Descriptor	Daytime Maximum (7 a.m. to 10 p.m.)	Nighttime Maximum (10 p.m. to 7 a.m.)
Typical	Hourly L_{eq}, dB	55	45
Tonal, impulsive, repetitive, or consist primarily of speech or music	Hourly Leq, dB	50	40

The City may impose noise level standards which are more or less restrictive than those specified above based upon determination of existing low or high ambient noise levels.

SOURCE: TABLE N-1 OF THE CITY OF RANCHO CORDOVA GENERAL PLAN NOISE ELEMENT

FIGURE 3.10-3: GENERAL PLAN TABLE N-2: MAXIMUM TRANSPORTATION NOISE EXPOSURE

Land Use	Outdoor Activity Areas[1] Ldn/CNEL, dB	Interior Spaces	
		Ldn/CNEL, dB	Leq, dB[2]
Residential	60[3]	45	--
Residential subject to noise from railroad tracks, aircraft overflights, or similar noise sources which produce clearly identifiable, discrete noise events (e.g., the passing of a single train)	60[3]	40[5]	--
Transient lodging	60[4]	45	--
Hospitals, nursing homes	60[3]	45	--
Theaters, auditoriums, music halls	--	--	35
Churches, meeting halls	60[3]	--	40
Office buildings	--	--	45
Schools, libraries, museums	--	--	45
Playgrounds, neighborhood parks	70	--	--

1 *Where the location of outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use. Where it is not practical to mitigate exterior noise levels at patio or balconies of apartment complexes, a common area such as a pool or recreation area may be designated as the outdoor activity area.*

2 *As determined for a typical worst-case hour during periods of use.*

3 *Where it is not possible to reduce noise in outdoor activity areas to 60 dB Ldn/CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB Ldn/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.*

4 *In the case of hotel/motel facilities or other transient lodging, outdoor activity areas such as pool areas may not be included in the project design. In these cases, only the interior noise level criterion will apply.*

5 *The intent of this noise standard is to provide increased protection against sleep disturbance for residences located near railroad tracks.*

SOURCE: TABLE N-2 OF THE CITY OF RANCHO CORDOVA GENERAL PLAN NOISE ELEMENT

City of Rancho Cordova Municipal Code Chapter 6.68

Chapter 6.68 of the Rancho Cordova Municipal Code identifies performance standards for noise. The maximum exterior noise level for Residential Districts is set at 55 dBA. This standard is 5.0 dBA lower between 10:00 p.m. and 7:00 a.m. The following table from Section 6.68.070, subsection B (Figure 3.10-4) outlines allowable exterior noise standard exceedances in any one hour.

FIGURE 3.10-4: CITY OF RANCHO CORDOVA MUNICIPAL CODE. SECTION 6.68.070(B)

Cumulative Duration of the Intrusive Sound	Allowance Decibels
1. Cumulative period of 30 minutes per hour	0
2. Cumulative period of 15 minutes per hour	+ 5
3. Cumulative period of 5 minutes per hour	+10
4. Cumulative period of 1 minute per hour	+15
5. Level not to be exceeded for any time per hour	+20

SOURCE: TABLE N-2 OF THE CITY OF RANCHO CORDOVA GENERAL PLAN NOISE ELEMENT

The limits specified in subsection B are reduced by five dBA for noises which are impulsive or consist of speech or music. If the existing ambient noise level exceeds the first four categories in subsection B, then the allowable noise exterior limit shall be increased by five-dBA increments to encompass the ambient noise level.

Furthermore, the interior noise level in any residential dwelling unit located in a mixed-use building or development shall not exceed 45 dBA for a cumulative period of more than five minutes in any hour, 50 dBA for a cumulative period of more than one minute in any hour, or 55 dBA for any period of time. There is a slight reprieve in that the allowable noise limit shall be increased by five-dBA increments to encompass the ambient noise level if the existing ambient noise level exceeds the standard.

Exemptions to the interior and exterior noise standards are outlined in Section 6.68.090 of the City's Municipal Code. A list of the exemptions is provided here:

A. School bands, school athletic and school entertainment events;
B. Outdoor gatherings, public dances, shows and sporting and entertainment events, provided said events are conducted pursuant to a license or permit by the city;
C. Activities conducted on parks, public playgrounds and school grounds, provided such parks, playgrounds and school grounds are owned and operated by a public entity or private school;
D. Any mechanical device, apparatus or equipment related to or connected with emergency activities or emergency work;
E. Noise sources associated with construction, repair, remodeling, demolition, paving or grading of any real property, provided said activities do not take place between the hours

of 8:00 p.m. and 6:00 a.m. on weekdays and Friday commencing at 8:00 p.m. through and including 7:00 a.m. on Saturday; Saturdays commencing at 8:00 p.m. through and including 7:00 a.m. on the next following Sunday and on each Sunday after the hour of 8:00 p.m.; provided, however, when an unforeseen or unavoidable condition occurs during a construction project and the nature of the project necessitates that work in process be continued until a specific phase is completed, the contractor or owner shall be allowed to continue work after 8:00 p.m. and to operate machinery and equipment necessary until completion of the specific work in progress can be brought to conclusion under conditions which will not jeopardize inspection acceptance or create undue financial hardships for the contractor or owner;

F. Noise sources associated with agricultural operations, provided such operations do not take place between the hours of 8:00 p.m. and 6:00 a.m.;

G. All mechanical devices, apparatus or equipment which are utilized for the protection or salvage of agricultural crops during periods of adverse weather conditions or when the use of mobile noise sources is necessary for pest control;

H. Noise sources associated with maintenance of residential area property, provided said activities take place between the hours of 6:00 a.m. and 8:00 p.m. on any day except Saturday or Sunday, or between the hours of 7:00 a.m. and 8:00 p.m. on Saturday or Sunday;

I. Any activity, to the extent provisions of Chapter 65 of Title 42 of the United States Code and Articles 3 and 3.5 of Chapter 4 of Part 1 of Division 9 of the Public Utilities Code of the state of California preempt local control of noise regulations and land use regulations related to noise control of airports and their surrounding geographical areas, any noise source associated with the construction, development, manufacture, maintenance, testing or operation of any aircraft engine, or of any weapons system or subsystems which are owned, operated or under the jurisdiction of the United States, or any other activity to the extent regulation thereof has been preempted by state or federal law or regulation;

J. Any noise sources associated with the maintenance and operation of aircraft or airports which are owned or operated by the United States. [Ord. 38-2007 § 1 (Exh. 1(E)); Ord. 21-2003 §§ 2, 4; Ord. 20-2003 §§ 2, 4; SCC 254 § 1 (part), 1976].

3.10.3 IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the Project will have a significant impact related to noise if it will result in:

- Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
- Generation of excessive groundborne vibration or groundborne noise levels.
- 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, exposure of people residing or working in the area to excessive noise levels resulting from the proposed Project.

Determination of a Significant Increase in Noise Levels

The noise standards applicable to the Project include the relevant portions of the Rancho Cordova General Plan and the City's Municipal Code described in the Regulatory Framework Section above (Section 3.10.2), and the following standards. Generally, a project may have a significant effect on the environment if it will substantially increase the ambient noise levels for adjoining areas or expose people to severe noise levels. In practice, more specific professional standards have been developed. These standards state that a noise impact may be considered significant if it would generate noise that would conflict with local project criteria or ordinances, or substantially increase noise levels at noise sensitive land uses. The potential increase in traffic noise from the project is a factor in determining significance. Research into the human perception of changes in sound level indicates the following:

- A 3-dB change is barely perceptible,
- A 5-dB change is clearly perceptible, and
- A 10-dB change is perceived as being twice or half as loud.

A limitation of using a single noise level increase value to evaluate noise impacts is that it fails to account for pre-Project-noise conditions. Table 3.10-4 is based upon recommendations made by the Federal Interagency Committee on Noise (FICON) to provide guidance in the assessment of changes in ambient noise levels resulting from aircraft operations. The recommendations are based upon studies that relate aircraft noise levels to the percentage of persons highly annoyed by the noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, it has been accepted that they are applicable to all sources of noise described in terms of cumulative noise exposure metrics such as the L_{dn}.

TABLE 3.10-4: SIGNIFICANCE OF CHANGES IN NOISE EXPOSURE

AMBIENT NOISE LEVEL WITHOUT PROJECT, LDN	*INCREASE REQUIRED FOR SIGNIFICANT IMPACT*
<60 dB	+5.0 dB or more
60-65 dB	+3.0 dB or more
>65 dB	+1.5 dB or more

SOURCE: FEDERAL INTERAGENCY COMMITTEE ON NOISE (FICON)

Based on the Table 3.10-4 data, an increase in the traffic noise level of 5 dB or more would be significant where the pre-Project noise levels are less than 60 dB L_{dn}, or 3 dB or more where existing noise levels are between 60 to 65 dB Ldn. Extending this concept to higher noise levels, an increase in the traffic noise level of 1.5 dB or more may be significant where the pre-Project traffic noise level exceeds 65 dB L_{dn}. The rationale for the Table 3.10-4 criteria is that, as ambient noise levels increase, a smaller increase in noise resulting from a project is sufficient to cause annoyance.

Vibration Standards

Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that in that noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person's perception to the vibration will depend on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating.

Vibration can be measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities in inches per second. Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of peak particle velocities.

The City not have specific policies pertaining to vibration levels. However, vibration levels associated with construction activities and railroad operations are addressed as potential noise impacts associated with Project implementation.

Human and structural response to different vibration levels is influenced by several factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. Table 3.10-5 indicates that the threshold for damage to structures ranges from 0.2 to 0.6 peak particle velocity in inches per second (in/sec p.p.v). 0.2 in/sec p.p.v. is considered a safe criterion that would protect against architectural or structural damage. The general threshold at which human annoyance could occur is noted as 0.1 in/sec p.p.v.

TABLE 3.10-5: EFFECTS OF VIBRATION ON PEOPLE AND BUILDINGS

PEAK PARTICLE VELOCITY		*HUMAN REACTION*	*EFFECT ON BUILDINGS*
MM/SEC.	*IN./SEC.*		
0.15-0.30	0.006-0.019	Threshold of perception; possibility of intrusion	Vibrations unlikely to cause damage of any type
2.0	0.08	Vibrations readily perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
2.5	0.10	Level at which continuous vibrations begin to annoy people	Virtually no risk of "architectural" damage to normal buildings
5.0	0.20	Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relative short periods of vibrations)	Threshold at which there is a risk of "architectural" damage to normal dwelling - houses with plastered walls and ceilings. Special types of finish such as lining of walls, flexible ceiling treatment, etc., would minimize "architectural" damage
10-15	0.4-0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause "architectural" damage and possibly minor structural damage.

SOURCE: CALTRANS. TRANSPORTATION RELATED EARTHBORN VIBRATIONS. TAV-02-01-R9601 FEBRUARY 20, 2002.

IMPACTS AND MITIGATION MEASURES

Impact 3.10-1: The Project may result in exposure of persons to or generation of substantial temporary or permanent increase in ambient noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies – Project Operation (Less than Significant)

EXTERIOR TRAFFIC NOISE IMPACTS – EXISTING RECEPTORS

To predict noise levels due to Project traffic, the FHWA Highway Traffic Noise Prediction Model (FHWA RD-77-108) was used. Traffic volumes for existing conditions were obtained from the traffic data prepared for the Project (Kimley-Horn, 2018). Truck percentages and vehicle speeds on the local area roadways were estimated from field observations.

Implementation of the Project would result in an increase in traffic volumes on the local roadway network, and consequently, an increase in noise levels from traffic sources along affected segments. Tables 3.10-6 and 3.10-7 show the predicted traffic noise level increases on the local roadway network for Existing, Existing plus Project, Cumulative No Project, and Cumulative plus Project conditions. The tables also show the criterion for a significant increase for each roadway segment, which varies depending on the Existing and Cumulative condition noise levels without the Project. Appendix B of Appendix H provides the complete inputs and results of the FHWA traffic noise modeling.

TABLE 3.10-6: EXISTING AND EXISTING PLUS PROJECT TRAFFIC NOISE LEVELS

ROADWAY	*SEGMENT*	*NOISE LEVELS (L_{DN}, dB) AT NEAREST SENSITIVE RECEPTORS*				
		EXISTING	*EXISTING + PROJECT*	*CHANGE*	*CRITERION [1]*	*SIGNIFICANT?*
Jackson Rd.	Bradshaw Rd. to Excelsior Rd.	67.4	67.4	0.0	+1.5 dB	No
Jackson Rd.	Excelsior Rd. to Eagles Nest Rd.	67.1	67.2	0.1	+1.5 dB	No
Jackson Rd.	Eagles Nest Rd. to Sunrise Blvd.	66.1	66.2	0.1	+1.5 dB	No
Jackson Rd.	Sunrise Blvd. to Grant Line Rd.	67.1	67.2	0.1	+1.5 dB	No
Excelsior Rd.	Kiefer Blvd. to Jackson Rd.	60.0	60.0	0.0	+3 dB	No
Kiefer Blvd.	Grant Line Rd. to Jackson Rd./SR-16	55.1	55.1	0.0	+5 dB or > 60 dB	No
International Dr.	Zinfandel Dr. to Sunrise Blvd.	65.2	66.1	0.9	+1.5 dB	No
Mather Blvd.	Femoyer St. to Douglas Rd.	58.1	58.5	0.4	+5 dB or > 60 dB	No
Douglas Rd.	Mather Blvd. to Sunrise Blvd.	66.3	66.5	0.2	+1.5 dB	No
Douglas Rd.	Sunrise Blvd. to Grant Line Rd.	61.0	61.2	0.2	+3 dB	No
White Rock Rd.	Zinfandel Dr. to Sunrise Blvd.	65.3	65.3	0.0	+1.5 dB	No
White Rock Rd.	Sunrise Blvd. to Grant Line Rd.	60.9	61.0	0.1	+3 dB	No
White Rock Rd.	Grant Line Rd. to Prairie City Rd.	67.3	67.4	0.1	+1.5 dB	No

ROADWAY	SEGMENT	NOISE LEVELS (L_{DN}, dB) AT NEAREST SENSITIVE RECEPTORS				
		EXISTING	EXISTING + PROJECT	CHANGE	CRITERION [1]	SIGNIFICANT?
Mather Field Rd.	Folsom Blvd. to US 50 WB Ramp	65.7	65.7	0.0	+1.5 dB	No
Mather Field Rd.	US 50 WB Ramp to US 50 EB Ramp	68.7	68.7	0.0	+1.5 dB	No
Mather Field Rd.	US 50 to International Dr.	69.5	69.5	0.0	+1.5 dB	No
Zinfandel Dr.	Folsom Blvd. to US 50 WB	57.0	57.1	0.1	+5 dB or > 60 dB	No
Zinfandel Dr.	US 50 to White Rock Rd.	66.6	66.8	0.2	+1.5 dB	No
Zinfandel Dr.	White Rock Rd. to International Rd.	65.8	66.1	0.3	+1.5 dB	No
Zinfandel Dr.	International Rd. to Douglas Rd.	59.6	59.6	0.0	+5 dB or > 60 dB	No
Sunrise Blvd.	US 50 WB Ramp to US 50 EB Ramp	64.3	64.5	0.2	+3 dB	No
Sunrise Blvd.	US 50 to Folsom Blvd.	67.1	67.3	0.2	+1.5 dB	No
Sunrise Blvd.	Folsom Blvd. to White Rock Rd.	69.4	69.8	0.4	+1.5 dB	No
Sunrise Blvd.	White Rock Rd. to Douglas Rd.	69.3	70.2	0.9	+1.5 dB	No
Sunrise Blvd.	Douglas Rd. to Jackson Rd.	64.6	66.1	1.5	+3 dB	No
Sunrise Blvd.	Jackson Rd. to Grant Line Rd.	66.8	67.1	0.3	+1.5 dB	No
Grant Line Rd.	White Rock Rd. to Douglas Rd.	69.8	69.9	0.1	+1.5 dB	No
Grant Line Rd.	Douglas Rd. to Jackson Rd.	64.7	64.7	0.0	+3 dB	No
Grant Line Rd.	Jackson Rd. to Sunrise Blvd.	64.3	64.3	0.0	+3 dB	No

[1] *WHERE EXISTING NOISE LEVELS ARE LESS THAN 60 DB AN INCREASE OF 5 DB WOULD BE A SIGNIFICANT INCREASE. ADDITIONALLY, ANY INCREASE CAUSING NOISE LEVELS TO EXCEED THE CITY'S NORMALLY ACCEPTABLE 60 DB LDN NOISE LEVEL STANDARD AT AN EXISTING OUTDOOR ACTIVITY AREA OF A RESIDENTIAL USE WOULD ALSO BE SIGNIFICANT. WHERE EXISTING NOISE LEVELS EXCEED 60 DB BUT ARE LESS THAN 65 DB, AN INCREASE OF 3 DB OR MORE WOULD BE SIGNIFICANT. WHERE EXISTING NOISE LEVELS EXCEED 65 DB, AN INCREASE OF 1.5 DB OR MORE WOULD BE SIGNIFICANT.*

SOURCE: FHWA-RD-77-108 WITH INPUTS FROM KIMLEY HORN AND SAXELBY ACOUSTICS. 2019.

TABLE 3.10-7: CUMULATIVE AND CUMULATIVE + PROJECT TRAFFIC NOISE LEVELS

ROADWAY	SEGMENT	NOISE LEVELS (L_{DN}, dB) AT NEAREST SENSITIVE RECEPTORS				
		CUMULATIVE	CUMULATIVE + PROJECT	CHANGE	CRITERION [1]	SIGNIFICANT?
Jackson Rd.	Bradshaw Rd. to Excelsior Rd.	70.0	70.0	0.0	+1.5 dB	No
Jackson Rd.	Excelsior Rd. to Eagles Nest Rd.	70.0	70.0	0.0	+1.5 dB	No
Jackson Rd.	Eagles Nest Rd. to Sunrise Blvd.	68.7	68.7	0.0	+1.5 dB	No
Jackson Rd.	Sunrise Blvd. to Grant Line Rd.	69.1	69.1	0.0	+1.5 dB	No
Excelsior Rd.	Kiefer Blvd. to Jackson Rd.	62.9	62.9	0.0	+3 dB	No
Kiefer Blvd.	Grant Line Rd. to Jackson Rd./SR-16	58.8	59.0	0.2	+5 dB or > 60 dB	No
International Dr.	Zinfandel Dr. to Sunrise Blvd.	68.8	68.8	0.0	+1.5 dB	No
Mather Blvd.	Femoyer St. to Douglas Rd.	63.9	64.2	0.3	+3 dB	No
Douglas Rd.	Mather Blvd. to Sunrise Blvd.	71.1	71.4	0.3	+1.5 dB	No
Douglas Rd.	Sunrise Blvd. to Grant Line Rd.	66.1	66.8	0.7	+1.5 dB	No

ROADWAY	SEGMENT	NOISE LEVELS (L_{DN}, dB) AT NEAREST SENSITIVE RECEPTORS				
		CUMULATIVE	CUMULATIVE + PROJECT	CHANGE	CRITERION [1]	SIGNIFICANT?
White Rock Rd.	Zinfandel Dr. to Sunrise Blvd.	67.6	67.7	0.1	+1.5 dB	No
White Rock Rd.	Sunrise Blvd. to Grant Line Rd.	67.7	67.7	0.0	+1.5 dB	No
White Rock Rd.	Grant Line Rd. to Prairie City Rd.	71.5	71.7	0.2	+1.5 dB	No
Mather Field Rd.	Folsom Blvd. to US 50 WB Ramp	67.0	67.0	0.0	+1.5 dB	No
Mather Field Rd.	US 50 WB Ramp to US 50 EB Ramp	69.6	69.7	0.1	+1.5 dB	No
Mather Field Rd.	US 50 to International Dr.	70.8	70.8	0.0	+1.5 dB	No
Zinfandel Dr.	Folsom Blvd. to US 50 WB	57.2	57.3	0.1	+5 dB or > 60 dB	No
Zinfandel Dr.	US 50 to White Rock Rd.	68.2	68.2	0.0	+1.5 dB	No
Zinfandel Dr.	White Rock Rd. to International Rd.	67.7	67.8	0.1	+1.5 dB	No
Zinfandel Dr.	International Rd. to Douglas Rd.	61.6	61.8	0.2	+3 dB	No
Sunrise Blvd.	US 50 WB Ramp to US 50 EB Ramp	64.6	64.6	0.0	+3 dB	No
Sunrise Blvd.	US 50 to Folsom Blvd.	67.4	67.5	0.1	+1.5 dB	No
Sunrise Blvd.	Folsom Blvd. to White Rock Rd.	69.4	69.5	0.1	+1.5 dB	No
Sunrise Blvd.	White Rock Rd. to Douglas Rd.	71.3	71.5	0.2	+1.5 dB	No
Sunrise Blvd.	Douglas Rd. to Jackson Rd.	67.6	67.7	0.1	+1.5 dB	No
Sunrise Blvd.	Jackson Rd. to Grant Line Rd.	69.1	69.1	0.0	+1.5 dB	No
Grant Line Rd.	White Rock Rd. to Douglas Rd.	73.5	73.10	0.2	+1.5 dB	No
Grant Line Rd.	Douglas Rd. to Jackson Rd.	70.1	70.3	0.2	+1.5 dB	No
Grant Line Rd.	Jackson Rd. to Sunrise Blvd.	66.7	66.8	0.1	+1.5 dB	No
Kiefer Blvd.	Eagles Nest Rd. to Sunrise Blvd.	58.6	58.6	0.0	+5 dB or > 60 dB	No
Kiefer Blvd.	Sunrise Blvd. to Rancho Cordova Pkwy.	62.8	62.8	0.0	+3 dB	No
Chrysanthy Blvd.	Sunrise Blvd. to Rancho Cordova Pkwy.	56.1	57.1	1.0	+5 dB or > 60 dB	No
Rancho Cordova Pkwy.	Chrysanthy Blvd. to Kiefer Blvd.	60.8	61.1	0.3	+3 dB	No

[1] WHERE EXISTING NOISE LEVELS ARE LESS THAN 60 DB AN INCREASE OF 5 DB WOULD BE A SIGNIFICANT INCREASE. ADDITIONALLY, ANY INCREASE CAUSING NOISE LEVELS TO EXCEED THE CITY'S NORMALLY ACCEPTABLE 60 DB LDN NOISE LEVEL STANDARD AT AN EXISTING OUTDOOR ACTIVITY AREA OF A RESIDENTIAL USE WOULD ALSO BE SIGNIFICANT. WHERE EXISTING NOISE LEVELS EXCEED 60 DB BUT ARE LESS THAN 65 DB, AN INCREASE OF 3 DB OR MORE WOULD BE SIGNIFICANT. WHERE EXISTING NOISE LEVELS EXCEED 65 DB, AN INCREASE OF 1.5 DB OR MORE WOULD BE SIGNIFICANT.

SOURCE: FHWA-RD-77-108 WITH INPUTS FROM KIMLEY HORN AND SAXELBY ACOUSTICS. 2019.

Based upon data in Tables 3.10-6 and 3.10-7, the Project is predicted to result in a maximum traffic noise level increase of 1.5 dBA. As shown in Tables 3.10-6 and 3.10-7, some noise-sensitive receptors located along the Project-area roadways are currently exposed to exterior traffic noise levels exceeding the City of Rancho Cordova 60 dB L_{dn} exterior noise level standard for residential

uses. These receptors would continue to experience elevated exterior noise levels with implementation of the Project. For example, sensitive receptors under Existing conditions located adjacent to Sunrise Boulevard between Douglas Road and Jackson Road experience an exterior noise level of 64.6 dB L_{dn}. Under Existing plus Project conditions, exterior traffic noise levels are predicted to be approximately 66.1 dB L_{dn}. Exterior noise levels in both scenarios exceed the City's exterior noise level standard of 60 dB L_{dn}. However, the Project's contribution of 1.5 dB would not exceed the FICON criterion of 3 dB where existing ambient noise levels without the Project are between 60 and 65 dB L_{dn}. For all segments that exceed the City's exterior noise level standard under Existing plus Project and Cumulative plus Project conditions, the Project would not cause a significant increase in noise levels as shown in Tables 3.10-6 and 3.10-7. Therefore, this would be a ***less than significant*** impact.

EXTERIOR TRAFFIC NOISE IMPACTS – PROPOSED RECEPTORS

The FHWA traffic noise prediction model was used to model traffic noise levels at the proposed residential land uses under Cumulative plus Project conditions based on the traffic volumes provided by Kimley Horn. Table 3.10-8 shows the predicted traffic noise levels at the proposed residential uses adjacent to the major Project-area arterial roadways. Table 3.10-8 also indicates the property line noise barrier heights required to achieve compliance with an exterior noise level standard of 60 dB L_{dn}.

TABLE 3.10-8: CUMULATIVE + PROJECT TRANSPORTATION NOISE LEVELS AT PROPOSED RESIDENTIAL USES

SEGMENT	*APPROXIMATE RESIDENTIAL SETBACK, FEET[1]*	*ADT*	*PREDICTED TRAFFIC NOISE LEVELS, DB L_{DN}[2]*					
			NO WALL	*6' WALL*	*7' WALL*	*8' WALL*	*9' WALL*	*10' WALL*
CHRYSANTHY BOULEVARD								
Project site, Rancho Cordova Pkwy. to Americanos Blvd.	90	14,651	64	58	57	56	55	54
RANCHO CORDOVA PARKWAY								
Project site, north of Chrysanthy Blvd.	100	22,140	66	61	60	59	58	57
Project site, south of Chrysanthy Blvd.	525	8,965	52	46	45	44	44	43

NOTES: ADT = AVERAGE DAILY TRIPS

[1] SETBACK DISTANCES ARE MEASURED IN FEET FROM THE CENTERLINES OF THE ROADWAYS TO THE CENTER OF RESIDENTIAL BACKYARDS.

[2] THE MODELED NOISE BARRIERS ASSUME FLAT SITE CONDITIONS WHERE ROADWAY ELEVATIONS, BASE OF WALL ELEVATIONS, AND BUILDING PAD ELEVATIONS ARE APPROXIMATELY EQUIVALENT. SOUND WALL HEIGHT MAY BE ACHIEVE D THROUGH THE USE A WALL AND EARTHEN BERM TO ACHIEVE THE TOTAL HEIGHT (I.E. 6-FOOT WALL ON 2-FOOT BERM IS EQUIVALENT TO AN 8-FOOT TALL WALL).

SOURCE: FHWA-RD-77-108 WITH INPUTS FROM KIMLEY HORN AND SAXELBY ACOUSTICS. 2019.

The complete inputs and results to the FHWA traffic noise prediction model and barrier calculations are contained in the Noise Study Appendix B (see Appendix H of this EIR). The modeled noise barriers assume flat site conditions where roadway elevations, base of wall elevations, and building pad elevations are approximately equivalent.

Table 3.10-8 shows that residences along Chrysanthy Boulevard will be exposed to noise levels of 64 dB L_{dn} in the backyard areas and residences along Rancho Cordova Parkway north of Chrysanthy Boulevard would be exposed to noise levels of 66 dB L_{dn} in the backyard areas; these noise levels exceed the City's threshold of 60 dB for outdoor activity areas of residential uses. Table 3.10-8 indicate that noise barriers six to seven feet in height would generally be sufficient to achieve compliance with the City's 60 dB L_{dn} exterior noise level standard for the proposed residential uses. The Project has been designed to minimize noise to rear yards through including landscaped setbacks from the roadways and use of six-foot soundwalls along Chrysanthy Boulevard and along the segment of Rancho Cordova Parkway where residential uses are proposed. The soundwalls would reduce noise levels along Rancho Cordova Parkway to acceptable levels of 58 dB Ldn. The soundwalls would reduce noise levels at residences north of Chrysanthy Boulevard to 61 dB Ldn, which is within the City's conditionally acceptable exterior noise standard of 65 dB L_{dn}. The SPA Handbook does provide for use of measures other than soundwalls, such as building orientation and use of noise-attenuating features, provided that a site-specific acoustical analysis is conducted that demonstrates that the alternative methods would ensure that noise levels do not exceed the City's noise standards. This impact is ***less than significant.***

INTERIOR TRAFFIC NOISE IMPACTS

Modern construction typically provides a 25-dB exterior-to-interior noise level reduction with windows closed. Therefore, sensitive receptors exposed to exterior noise of 70 dB L_{dn}, or less, will typically comply with the City's 45 dB L_{dn} interior noise level standard. Additional noise reduction measures, such as acoustically-rated windows, are generally required for exterior noise levels exceeding 70 dB L_{dn}.

It should be noted that exterior noise levels are typically 2 to 3 dB higher at second floor locations. Additionally, noise barriers do not reduce exterior noise levels at second floor locations. The proposed residential uses are predicted to be exposed to unmitigated first floor exterior transportation noise levels ranging between 52 to 66 dB L_{dn}. Therefore, second floor facades are predicted to be exposed to exterior noise levels of up to 55 to 69 dB L_{dn}.

This analysis assumes that mechanical ventilation will be provided to allow residents to keep doors and windows closed, as desired for acoustical isolation. Based upon a 25-dB exterior-to-interior noise level reduction, interior noise levels are predicted to range between 30 to 44 dB L_{dn}. Accordingly, predicted interior noise levels along the first row of residential uses closest to Chrysanthy Boulevard and Rancho Cordova Parkway would comply with the City's 45 dB L_{dn} interior noise level standard. Therefore, additional interior noise control measures would not be required for these residential uses and impacts to interior noise levels associated with traffic noise would be ***less than significant***.

COMMERCIAL USE NOISE

The Project includes approximately 32,000 square feet of commercial uses in the northwestern portion of the Project site. Substantial sources of noise from commercial mixed uses are generated

mainly by heating, ventilation, and air conditioning (HVAC) equipment and loading and unloading activities. Because residential land uses would be placed in close proximity to commercial mixed-use development, these sensitive receptors could be exposed to higher noise levels. However, typical rooftop-mounted HVAC units which are shielded by building parapets do not generate noise levels exceeding 45 dBA L_{eq} at ground floor receptors. Second floor receptors do not receive the same degree of shielding and may experience higher levels of nose. Limited volumes of small delivery vehicle traffic would occur at small loading/unloading areas in the commercial areas and, thus, could be a periodic source of noise to nearby or adjacent sensitive receptors for short periods. The SPA Handbook addresses the Project's potential to expose sensitive receptors to noise levels that exceed the City's standards through requiring future commercial uses to be designed, to minimize the potential to expose existing or future residences to noise levels in excess of the City's standards, through location and/or of noise-generating uses such as loading docks, equipment storage and repair facilities, and generators**.** Therefore, this impact is ***less than significant.***

PARKS USE NOISE

The Project includes 19.24 acres of public and private park and recreation facilities. Noise-generating activities occurring at the proposed park and recreation facilities would depend on facility type. Daytime noise associated with neighborhood parks typically includes intermittent noise such as adults' and children's voices, opening and closing of vehicle doors in parking lots, and use of landscape maintenance equipment. Typical noise levels from park playgrounds or athletics fields are approximately 55 dBA L_{eq} at a distance of 100 feet.

Recreational facilities at the community park could generate additional noise extending into the evening and nighttime hours during competitive sporting events (e.g., soccer games, football games, softball games, and track and field events). Noise sources commonly associated with these types of events include elevated voices from crowds, exterior public-address systems, and musical instruments. If an amplified speaker system is used during sporting events, additional increases in ambient noise levels could occur. Activities occurring during the more noise-sensitive evening and nighttime hours may result in increased levels of annoyance and sleep disruption for occupants of nearby residential dwellings. The specific site design has not been determined for the future recreation facilities, including Lot D (public park) which could accommodate competitive sporting events and other uses that may involve amplified sound. The SPA Handbook addresses potential noise impacts associated with parks and recreation uses by requiring a site-specific acoustical analysis to be performed to evaluate the potential noise generated by recreation facilities that include potential noise generating uses (e.g., competitive sports fields and other uses anticipated to involve amplified sound or large crowds) and, if potential noise levels would exceed City standards, by requiring a noise reduction plan to ensure that noise-generating uses are sited and designed in a manner that meets the City's noise standards. Therefore, adherence to the requirements of the SPA Handbook would ensure that future parks and recreation uses do not exceed the City's noise standards and would ensure that this impact is ***less than significant***.

Impact 3.10-2: The Project may result in exposure of persons to or generation of substantial temporary increase in ambient noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies – Project Construction (Less than Significant)

During the construction of the Project, including roads, water, sewer lines, and related infrastructure, noise from construction activities would add to the noise environment in the Project vicinity. Existing receptors to the proposed construction activities are located adjacent north and west of the site along Cregan Court, Erato Circle, Choteau Circle, and Pawcatuck Way. Table 3.10-9 shows typical construction equipment noise at 25 and 50 feet.

TABLE 3.10-9: CONSTRUCTION EQUIPMENT NOISE

TYPE OF EQUIPMENT	*MAXIMUM LEVEL, DB*	
	25 FEET	*50 FEET*
Backhoe	84	78
Compactor	89	83
Compressor (air)	84	78
Concrete Saw	96	90
Dozer	88	82
Dump Truck	82	76
Excavator	87	81
Generator	87	81
Jackhammer	94	89
Pneumatic Tools	91	85

SOURCE: ROADWAY CONSTRUCTION NOISE MODEL USER'S GUIDE. FEDERAL HIGHWAY ADMINISTRATION. FHWA-HEP-05-054. JANUARY 2006.

As indicated in Table 3.10-9, activities involved in construction would generate maximum noise levels ranging from 76 to 90 dBA L_{max} at a distance of 50 feet. Noise would also be generated during the construction phase by increased truck traffic on area roadways. A significant Project-generated noise source would be truck traffic associated with transport of heavy materials and equipment to and from construction sites. This noise increase would be of short duration and would likely occur primarily during daytime hours.

Construction activities would be temporary in nature and are exempt from noise regulation during the hours of 6:00 a.m. to 8:00 p.m. on weekdays and 7:00 a.m. to 8:00 p.m. on Saturdays and Sundays as outlined in the City's Municipal Code for noise standard exemptions. Specifically, as noted previously, Section 6.68.090(E) of the City's Municipal Code exempts the following from the interior and exterior noise standards:

> *E. Noise sources associated with construction, repair, remodeling, demolition, paving or grading of any real property, provided said activities do not take place between the hours of 8:00 p.m. and 6:00 a.m. on weekdays and Friday commencing at 8:00 p.m. through*

and including 7:00 a.m. on Saturday; Saturdays commencing at 8:00 p.m. through and including 7:00 a.m. on the next following Sunday and on each Sunday after the hour of 8:00 p.m.; provided, however, when an unforeseen or unavoidable condition occurs during a construction project and the nature of the project necessitates that work in process be continued until a specific phase is completed, the contractor or owner shall be allowed to continue work after 8:00 p.m. and to operate machinery and equipment necessary until completion of the specific work in progress can be brought to conclusion under conditions which will not jeopardize inspection acceptance or create undue financial hardships for the contractor or owner;

Construction activities which occur during the aforementioned hours of operation are exempt from the City's noise standards. While construction activities as described above are exempt from the City's noise standards, Chapter 3 of the SPA Handbook establishes noise standards, including the requirement that construction staging areas, including equipment staging, equipment and materials storage, and soil stockpiling for grading activities, shall be located centrally within each phase of Project development and shall be setback from residential dwellings to the maximum extent feasible and that construction equipment be fitted with factory-equipped mufflers and maintained in good working order. The SPA Handbook also requires construction activities to adhere to the City's Municipal Code requirements, including the specified hours of operation for construction activities. Adherence to these hours of operation would ensure that construction noise levels occur during normal daytime hours and do not conflict with the City's noise standards. Implementation of the requirements included in the SPA Handbook will minimize noise impacts to residential uses by requiring compliance with the City's noise standards, ensuring that construction staging areas, including equipment and materials storage, are located away from residences, and that noise from all construction equipment is reduced through requiring that the equipment be fitted with factory-equipped mufflers and maintained in good working order and will ensure that these potential impacts are reduced to a ***less-than-significant*** level.

Impact 3.10-3: The Project may result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels (Less than Significant)

Typical residential, commercial, and recreation activities would not result in excessive groundborne vibration or groundborne noise levels. However, Project construction could result in groundborne vibration or noise levels. Sensitive receptors which could be impacted by construction-related vibrations, especially vibratory compactors/rollers, are located approximately 25 feet or further from the Project area.

Construction vibration impacts include human annoyance and building structural damage. Human annoyance occurs when construction vibration rises significantly above the threshold of perception. Building damage can take the form of cosmetic or structural damage. Table 3.10-10 shows the typical vibration levels produced by construction equipment.

TABLE 3.10-10: VIBRATION LEVELS FOR VARYING CONSTRUCTION EQUIPMENT

TYPE OF EQUIPMENT	*P.P.V. @ 25 FEET (IN/SEC)*	*P.P.V. @ 100 FEET (IN/SEC)*
Large Bulldozer	0.089	0.011
Loaded Trucks	0.076	0.010
Small Bulldozer	0.003	0.000
Auger/drill Rigs	0.089	0.011
Jackhammer	0.035	0.004
Vibratory Hammer	0.070	0.009
Vibratory Compactor/roller	0.210	0.026

SOURCE: FEDERAL TRANSIT ADMINISTRATION, TRANSIT NOISE AND VIBRATION IMPACT ASSESSMENT GUIDELINES, MAY 2006.

With the exception of vibratory compactors, the Table 3.10-10 data indicate that construction vibration levels anticipated for the Project are less than the 0.2 in/sec threshold at a distance of 25 feet. Use of vibratory compactors within 26 feet of the adjacent buildings could cause vibrations in excess of 0.2 in/sec. Sensitive receptors which could be impacted by construction-related vibrations, especially vibratory compactors/rollers, are located approximately 25 feet or further from the Project area.

The SPA Handbook requires that any compaction required less than 26 feet from the adjacent residential structures to the north shall be accomplished by using static drum rollers which use weight instead of vibrations to achieve soil compaction or, as an alternative, construction vibration monitoring could be conducted to ensure that construction vibrations do not cause damage to any adjacent structures. Adherence to this requirement will ensure that potential vibration impacts are reduced to a ***less-than-significant*** level.

Impact 3.10-4: The Project would not expose people residing or working in the Project area to excessive noise levels as a result of nearby airstrips or airports (Less than Significant)

There are no private airstrips in the Project vicinity. Mather Airport is located approximately three miles from the Project site. Based upon the Sacramento County Land Use Compatibility Planning Noise Contours for Mather Airport, the Project site is located outside of the 60 dB CNEL noise contour. In addition, the Sacramento County Airport System has implemented noise abatement procedures, including guidelines for flights during nighttime hours, to limit aircraft noise exposure in the surrounding communities. Therefore, this is a ***less-than-significant*** impact.

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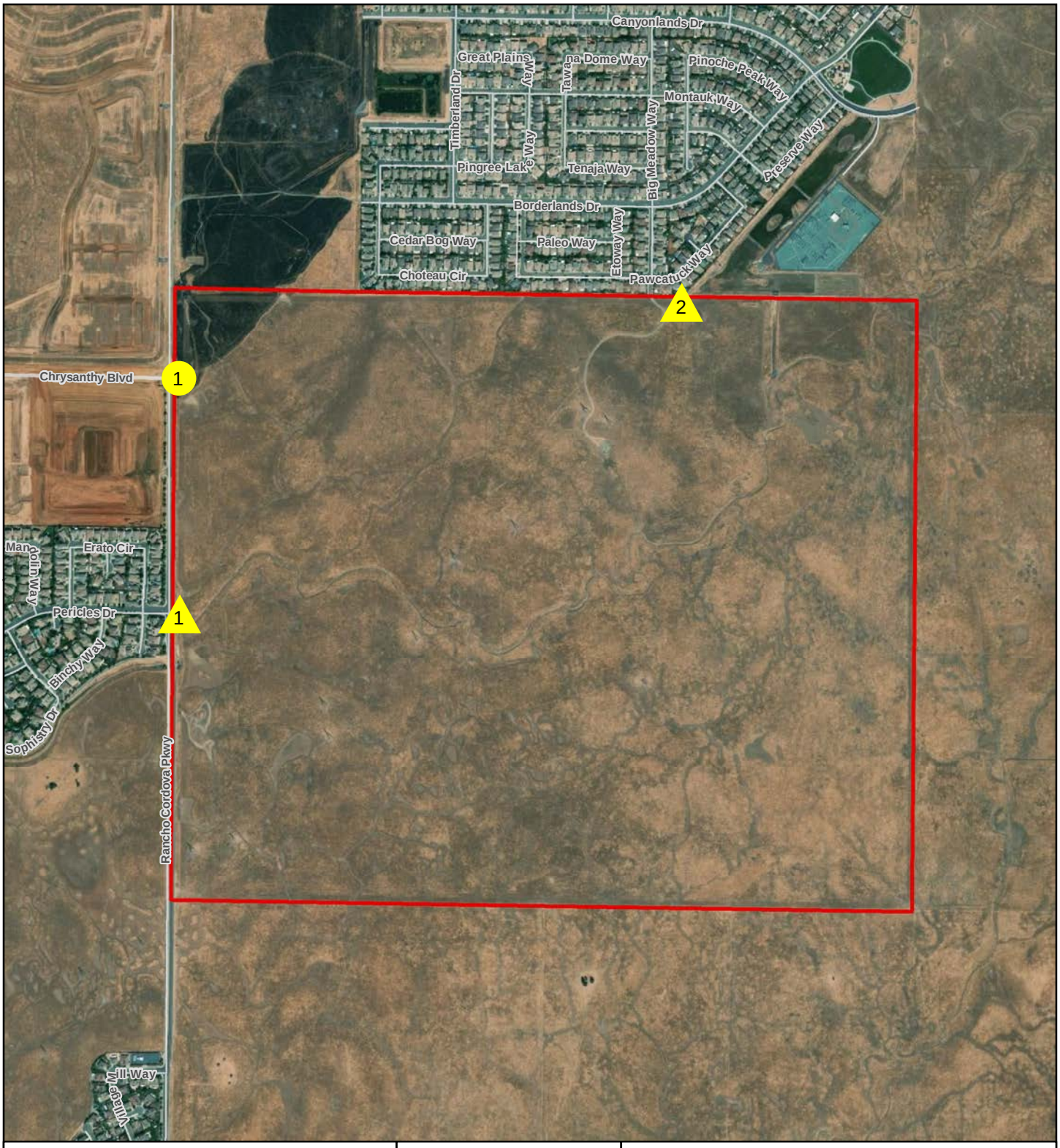

Legend

Project Location (APN 067-004-0008)

Noise Monitoring Locations

Noise Measurement Site - Long Term

Noise Measurement Site - Short Term

Data sources: Saxelby Acoustics, 10/2/2018; Sacramento County GIS; ArcGIS Online World Imagery Map Service. Map date: March 19, 2019.

N

0 250 500

Feet

1:12,000

THE RANCH
SACRAMENTO COUNTY, CALIFORNIA

Figure 3.10-1.
Noise Measurement Sites

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

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