Appendix H

Noise Impact Assessment

NOISE IMPACT ASSESSMENT

FOR

OLSEN-CHANDLER SPECIFIC PLAN

PASO ROBLES, CA

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INTRODUCTION

This report discusses the existing noise setting and identifies potential noise impacts associated with the implementation of the proposed Olsen-Chandler Specific Plan Project. Noise mitigation measures are recommended where the predicted noise levels would exceed applicable noise standards.

PROJECT OVERVIEW

The proposed Olsen-Chandler Specific Plan will provide a combination of land uses that include residential, commercial, community park/open space, private recreation, and school. The plan will include 1,293 residential dwelling units (comprised of 1,065 single-family units and 228 multi-family units), 10,659 square feet of shopping center, 29,335 square feet of private recreation, and 495-student elementary school. The project site is generally located to the north and south of Linne Road, between Fontana Road and Hanson Road. The proposed Olsen-Chandler Specific Plan is depicted in Figure 1.

ACOUSTIC FUNDAMENTALS

Noise is generally defined as sound that is loud, disagreeable, or unexpected. Sound, as described in more detail below, is mechanical energy transmitted in the form of a wave because of a disturbance or vibration.

Amplitude

Amplitude is the difference between ambient air pressure and the peak pressure of the sound wave. Amplitude is measured in decibels (dB) on a logarithmic scale. For example, a 65 dB source of a sound, such as a truck, when joined by another 65 dB source results in a sound amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by 3 dB). Amplitude is interpreted by the ear as corresponding to different degrees of loudness. Laboratory measurements correlate a 10 dB increase in amplitude with a perceived doubling of loudness and establish a 3 dB change in amplitude as the minimum audible difference perceptible to the average person.

Frequency

Frequency is the number of fluctuations in the pressure wave per second. The unit of frequency is the Hertz (Hz). One Hz equals one cycle per second. The human ear is not equally sensitive to the sound of different frequencies. Sound waves below 16 Hz or above 20,000 Hz cannot be heard at all, and the ear is more sensitive to sound in the higher portion of this range than in the lower. To approximate this sensitivity, the environmental sound is usually measured in A-weighted decibels (dBA). On this scale, the normal range of human hearing extends from about 10 dBA to about 140 dBA. Common community noise sources and noise levels are depicted in Figure 2.

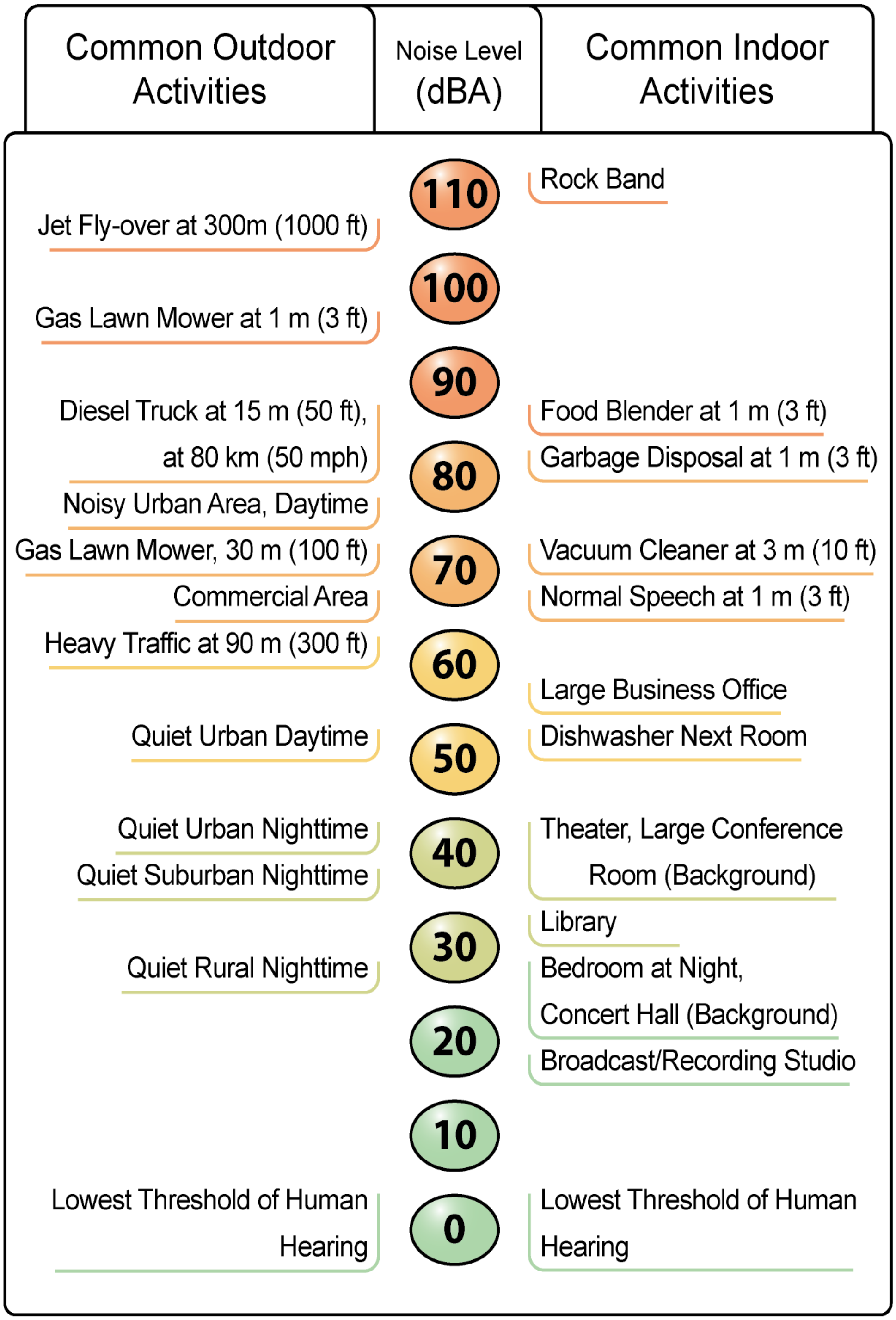
Addition of Decibels

Because decibels are logarithmic units, sound levels cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3-dB increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dB higher than one source under the same conditions. For example, if one automobile produces a sound level of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB; rather, they would combine to produce 73 dB. Under the decibel scale, three sources of equal loudness together would produce an increase of 5 dB.

Figure 1
Proposed Olsen-Chandler Specific Plan

Note: Low Density and Medium Density Residential consist of single-family units. High-Density Residential consists of multi-family units.
Source: Rincon Consultants 2019

Figure 2
Common Noise Levels



Source: Caltrans 2012

Sound Propagation & Attenuation

Geometric Spreading

The sound from a localized source (i.e., a point source) propagates uniformly outward in a spherical pattern. The sound level decreases (attenuates) at a rate of approximately 6 decibels for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path, and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of approximately 3 decibels for each doubling of distance from a line source, depending on ground surface characteristics. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a parking lot or body of water,), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between a line source and the receiver, such as soft dirt, grass, or scattered bushes and trees), an excess ground-attenuation value of 1.5 decibels per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation for soft surfaces results in an overall attenuation rate of 4.5 decibels per doubling of distance from a line source.

Shielding by Natural or Human-Made Features

A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features (e.g., hills and dense woods) and human-made features (e.g., buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receiver specifically to reduce noise. A barrier that breaks the line of sight between a source and a receiver will typically result in an approximate 5 dB of noise reduction. Taller barriers provide increased noise reduction.

Noise Descriptors

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Although the intensity (energy per unit area) of the sound is a purely physical quantity, the loudness or human response is determined by the characteristics of the human ear.

Human hearing is limited in the range of audible frequencies as well as in the way it perceives the sound-pressure level in that range. In general, people are most sensitive to the frequency range of 1,000–8,000 Hz, and perceive sounds within that range better than sounds of the same amplitude in higher or lower frequencies. To approximate the response of the human ear, sound levels of individual frequency bands are weighted, depending on the human sensitivity to those frequencies, which is referred to as the "A-weighted" sound level (expressed in units of dBA). The A-weighting network approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make judgments of the relative loudness or annoyance of a sound, their judgments correlate well with the A-weighted noise scale. Other weighting networks have been devised to address high noise levels or other special problems (e.g., B-, C-, and D-scales), but these scales are rarely used in conjunction with environmental noise.

The intensity of environmental noise fluctuates over time, and several descriptors of time-averaged noise levels are typically used. For the evaluation of environmental noise, the most commonly used descriptors are L_{eq}, L_{dn}, and CNEL. The energy-equivalent noise level, L_{eq}, is a measure of the average energy content (intensity) of noise over any given period. Many communities use 24-hour descriptors of noise levels to regulate noise. The day-night average noise level, L_{dn}, is the 24-hour average of the noise intensity, with a 10-dBA "penalty" added for nighttime noise (10 p.m. to 7 a.m.) to account for the greater sensitivity to noise during this period. CNEL, the community equivalent noise level, is similar to L_{dn} but adds an additional 5-dBA penalty for evening noise (7 p.m. to 10 p.m.) Common noise descriptors are summarized in Table 1.

Table 1
Common Acoustical Terms and Descriptors

Descriptor	Definition
Decibel (dB)	A unit-less measure of sound on a logarithmic scale, which indicates the squared ratio of sound pressure amplitude to referenced sound pressure amplitude. The reference pressure is 20 micro-pascals.
A-Weighted Decibel (dBA)	An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.
Energy Equivalent Noise Level (L_{eq})	The energy means (average) noise level. The instantaneous noise levels during a specific period of time in dBA are converted to relative energy values. From the sum of the relative energy values, an average energy value (in dBA) is calculated.
Minimum Noise Level (L_{min})	The minimum instantaneous noise level during a specific period of time.
Maximum Noise Level (L_{max})	The maximum instantaneous noise level during a specific period of time.
Day-Night Average Noise Level (DNL or L_{dn})	The 24-hour L_{eq} with a 10 dBA "penalty" for noise events that occur during the noise-sensitive hours between 10:00 p.m. and 7:00 a.m. In other words, 10 dBA is "added" to noise events that occur in the nighttime hours to account for increased sensitivity to noise during these hours.
Community Noise Equivalent Level (CNEL)	The CNEL is similar to the L_{dn} described above, but with an additional 5 dBA "penalty" added to noise events that occur between the hours of 7:00 p.m. to 10:00 p.m. The calculated CNEL is typically approximately 0.5 dBA higher than the calculated Ldn.

Human Response to Noise

The human response to environmental noise is subjective and varies considerably from individual to individual. Noise in the community has often been cited as a health problem, not in terms of actual physiological damage, such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities, including sleep, speech, recreation, and tasks that demand concentration or coordination. Hearing loss can occur at the highest noise intensity levels. When community noise interferes with human activities or contributes to stress, public annoyance with the noise source increases. The acceptability of noise and the threat to public well-being are the basis for land use planning policies preventing exposure to excessive community noise levels.

Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise or of the corresponding reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and habituation to noise over differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted: the so-called "ambient" environment. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged. Regarding increases in A-weighted noise levels, knowledge of the following relationships will be helpful in understanding this analysis:

- Except in carefully controlled laboratory experiments, a change of 1 dB cannot be perceived by humans;
- Outside of the laboratory, a 3-dB change is considered a just-perceivable difference;
- A change in the level of at least 5 dB is required before any noticeable change in community response would be expected. An increase of 5 dB is typically considered substantial;
- A 10-dB change is subjectively heard as an approximate doubling in loudness and would almost certainly cause an adverse change in community response.

Speech Communication

For most noise-sensitive land uses, an interior noise level of 45 dB L_{eq} is typically identified for the protection of speech communication in order to provide for 100-percent intelligibility of speech sounds. Assuming an average 20-dB reduction in sound level between outdoors and indoors (which is an average amount of sound attenuation that assumes windows are closed), this interior noise level would equate to an exterior noise level of 65 dBA L_{eq}. For outdoor voice communication, an exterior noise level of 60 dBA L_{eq} allows normal conversation at distances up to 2 meters with 95 percent sentence intelligibility (U.S. EPA 1974.) Based on this information, speech interference begins to become a problem when steady noise levels reach approximately 60 to 65 dBA. Within more noise-sensitive interior environments, such as educational facilities and places of worship, an average-hourly background noise level of 45 dBA L_{eq} is typically recommended.

Annoyance & Sleep Disruption

With regard to potential increases in annoyance, activity interference, and sleep disruption, land use compatibility determinations are typically based on the use of the cumulative noise exposure metrics (i.e., CNEL or L_{dn}). Perhaps the most comprehensive and widely accepted evaluation of the relationship between noise exposure and the extent of annoyance was one originally developed by Theodore J. Schultz in 1978. In 1978 the research findings of Theodore J. Schultz provided support for L_{dn} as the descriptor for environmental noise. Research conducted by Schultz identified a correlation between the cumulative noise exposure metric and individuals who were highly annoyed by transportation noise. The Schultz curve, expressing this correlation, became a basis for noise standards. When expressed graphically, this relationship is typically referred to as the Schultz curve. The Schultz curve indicates that approximately 13 percent of the population is highly annoyed at a noise level of 65 dBA L_{dn}. It also indicates that the percentage of people describing themselves as being highly annoyed accelerates smoothly between 55 and 70 dBA L_{dn}. A noise level of 65 dBA L_{dn} is a commonly referenced dividing point between lower and higher rates of people describing themselves as being highly annoyed.

The Schultz curve and associated research became the basis for many of the noise criteria subsequently established for federal, state, and local entities. Most federal and state of California regulations and policies related to transportation noise sources establish a noise level of 65 dBA CNEL/L_{dn} as the basic limit of acceptable noise exposure for residential and other noise-sensitive land uses. For instance, with respect to aircraft noise, both the Federal Aviation Administration (FAA) and the State of California have identified a noise level of 65 dBA L_{dn} as the dividing point between normally compatible and normally incompatible residential land use generally applied for the determination of land use compatibility. For noise-sensitive land uses exposed to aircraft noise, noise levels in excess of 65 dBA CNEL/L_{dn} are typically considered to result in a potentially significant increase in levels of annoyance.

Allowing for an average exterior-to-interior noise reduction of 20 dB, an exterior noise level of 65 dBA CNEL/L_{dn} would equate to an interior noise level of 45 dBA CNEL/L_{dn}. An interior noise level of 45 dB CNEL/L_{dn} is generally considered sufficient to protect against long-term sleep interference (U.S. EPA, 1974.) Within California, the California Building Code establishes a noise level of 45 dBA CNEL as the maximum acceptable interior noise level for residential uses (other than detached single family dwellings). Use of the 45 dBA CNEL threshold is further supported by recommendations provided in the State of California Office of Planning and Research's *General Plan Guidelines*, which recommend an interior noise level of 45 dB CNEL/L_{dn} as the maximum allowable interior noise level sufficient to permit "normal residential activity" (OPR 2017).

The cumulative noise exposure metric is currently the only noise metric for which there is a substantial body of research data and regulatory guidance defining the relationship between noise exposure, people's reactions, and land use compatibility. However, when evaluating environmental noise impacts involving intermittent noise events, such as aircraft overflights and train pass by, the use of cumulative noise metrics may not provide a thorough understanding of the resultant impact. The general public often finds it difficult to understand the relationship between intermittent noise events and cumulative noise exposure metrics. In such instances, supplemental use of other noise metrics, such as the L_{eq} or L_{max} descriptor, are sometimes used as a means of increasing public understanding regarding the relationship between these metrics and the extent of the resultant noise impact.

REGULATORY FRAMEWORK

Noise

Noise Control Act of 1972

The Noise Control Act of 1972 establishes a national policy to promote an environment for all Americans free from noise that jeopardizes their health and welfare. The Act also serves to (1) establish a means for effective coordination of Federal research and activities in noise control; (2) authorize the establishment of Federal noise emission standards for products distributed in commerce; and (3) provide information to the public respecting the noise emission and noise reduction characteristics of such products.

Department of Housing and Urban Development (HUD)

HUD guidelines for the acceptability of residential land use are set forth in the Code of Federal Regulations Title 24, Part 51, "Environmental Criteria and Standards." These guidelines parallel those suggested in the FICUN report: noise exposure of 65 dBA CNEL/L_{dn}, or less, is acceptable and between 65 and 75 dBA CNEL/L_{dn} noise exposure is considered normally acceptable provided appropriate sound-reduction measures are provided. Above 75 dBA CNEL/L_{dn} noise exposure is generally considered unacceptable. The guidelines also identify the recommended interior noise levels of 45 dBA CNEL/L_{dn}. These guidelines apply only to new construction supported by HUD grants and are not binding upon local communities.

California Code of Regulations, Title 24

Title 24 of the California Code of Regulations contains standards for allowable interior noise levels associated with exterior noise sources (California Building Code, 1998 edition, Volume 1, Appendix Chapter 12, Section 1208A). The standards apply to new hotels, motels, dormitories, apartment houses, and dwellings other than detached single family residences. The standards state that the interior noise level attributable to exterior sources shall not exceed 45 dBA CNEL in any habitable room. Proposed residential structures to be located where the CNEL exceeds 60 dBA are required to prepare an acoustical analysis showing that the proposed building design would achieve the prescribed allowable interior noise standard. Worst-case noise levels, either existing or future, shall be used as the basis for determining compliance with these standards.

California General Plan Guidelines

The State of California regulates vehicular and freeway noise affecting classrooms, sets standards for sound transmission and occupational noise control, and identifies noise insulation standards and airport noise/land-use compatibility criteria. The "State of California General Plan Guidelines" (OPR 2017), published by the Governor's Office of Planning and Research, also provides guidance for the acceptability of projects within specific CNEL/L_{dn} contours. The guidelines also present adjustment factors that may be used in order to arrive at noise acceptability standards 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.

2010 California Green Building Standards

The *2010 California Green Building Standards* (California Code of Regulations Title 24, Part 11, Section 5.507) requires that the wall and roof-ceiling assemblies making up a building envelope to have a minimum Sound Transmissions Class (STC) of 50, and exterior windows to have a minimum STC of 30 for any of the following building locations:

1. Within 1,000 feet of freeways
2. Within 5 miles of airports serving more than 10,000 commercial jets per year;
3. Where the sound levels at the property line regularly exceed 65 decibels, other than occasional sound due to church bells, train horns, emergency vehicles, and public warning systems.

The above standards do not apply to buildings with few or no occupants or where occupants are not likely to be affected by exterior noise (as determined by the enforcement authority), such as factories, stadiums, storage, enclosed parking structures, and utility buildings. This section also identifies a minimum STC of 40 for interior walls and floor-ceiling assemblies that separate tenant spaces and public spaces (CBSC 2010).

City of Paso Robles General Plan

Transportation Sources

The City's noise criteria for determination of future land use compatibility are presented in Figure 3. These guidelines are used to assess whether transportation noise can potentially pose a conflict with proposed land uses. For the most sensitive uses such as single-family residential, an exterior noise level of 60 dBA CNEL/L_{dn} is considered the maximum value that is "normally acceptable," 55 to 70 dBA CNEL/L_{dn} is considered the "conditionally acceptable" range, 70 to 75 dBA CNEL/L_{dn} is considered "normally unacceptable," and levels in excess of 75 dBA CNEL/L_{dn} is considered "clearly unacceptable." Proposed land uses are considered "conditionally acceptable" provided sufficient noise-reduction features have been incorporated to reduce interior noise levels to within acceptable levels.

In addition to the noise criteria for determination of land use compatibility, General Plan Policy N-1A establishes exterior and interior noise standards for transportation noise sources. Accordingly, the maximum allowable noise exposure for existing land use outdoor activity areas is 65 dBA CNEL/L_{dn} (except for parks). The maximum allowable noise exposure for existing land use interior activity areas is 45 dBA CNEL/L_{dn}. Assuming a minimum exterior-to-interior noise reduction of 20 dB, an exterior noise level of 65 dBA CNEL/L_{dn} would provide for an interior noise level of 45 dBA CNEL/L_{dn}. This interior noise standard applies to various noise-sensitive land uses, including residential dwellings, schools, hotels, motels, auditoriums, meeting halls, office buildings, nursing homes, hospitals, theaters, and libraries (City of El Paso de Robles 2003).

Stationary Sources

The City of Paso Robles has also adopted noise standards for stationary sources. The noise standards are applied at the property line of the receiving land use. The City's noise standards for stationary sources are summarized in Table 2.

Table 2
Maximum Allowable Noise Exposure-Stationary (Non-Transportation) Noise Sources[1]

	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Hourly L, dB [(2)]	50	45
Maximum level, dB [(2)]	70	65
Maximum level, dB-Impulsive Noise [(3)]	65	60

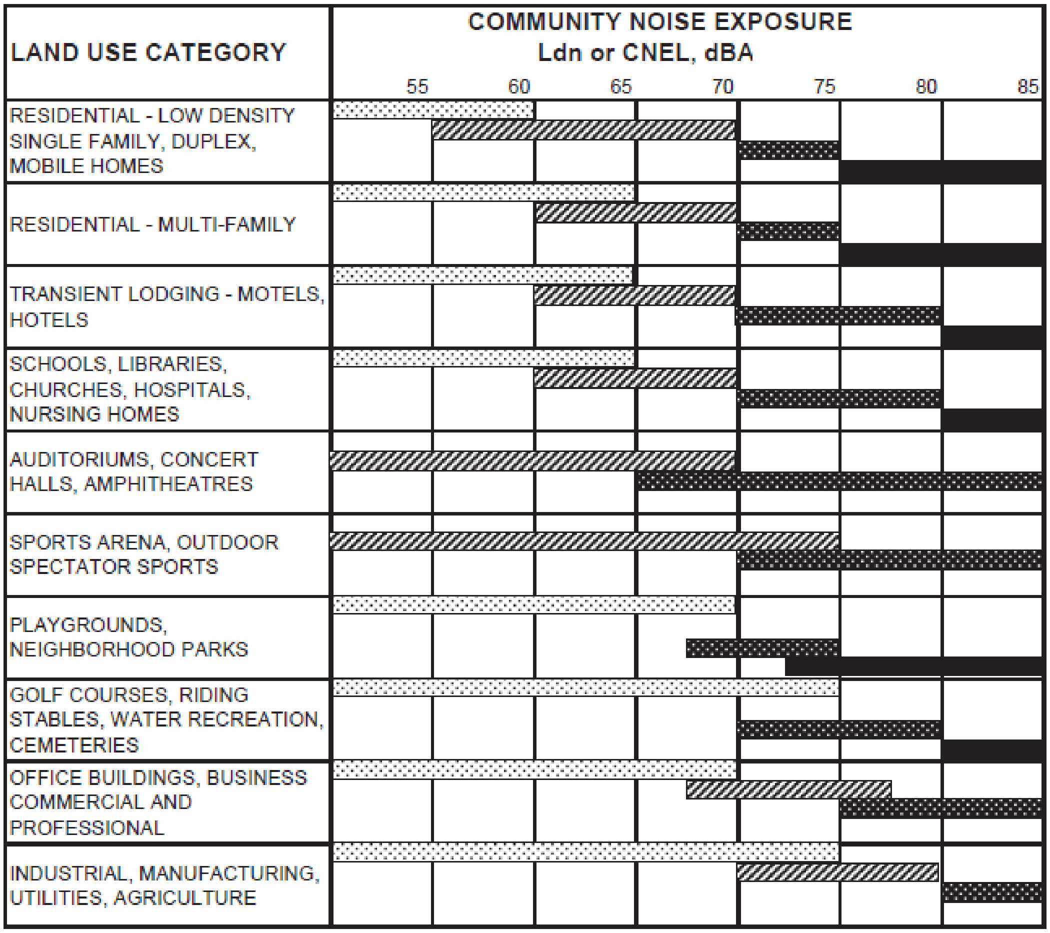
1. As determined at the property line of the receiving land use. When determining the effectiveness of noise mitigation measures, the standards may be applied on the receptor side of the noise barriers or other property line noise mitigation measures.
2. Sound level measurements shall be made with the slow meter response.
3. Sound level measurements shall be made with the fast meter response.
Source: City of El Paso de Robles 2003

Groundborne Vibration

There are no federal, state, or local regulatory standards for ground-borne vibration. However, Caltrans has developed vibration criteria based on potential structural damage risks and human annoyance. Caltrans-recommended criteria for the evaluation of groundborne vibration levels, with regard to structural damage and human annoyance, are summarized in Table 3. The criteria apply to continuous vibration sources, which include vehicle traffic, train, and most construction vibrations, with the exception of transient or intermittent construction activities, such as pile driving. All damage criteria for buildings are in terms of ground motion at the buildings' foundations. No allowance is included for the amplifying effects of structural components (Caltrans 2013).

As shown in Table 3, the threshold for architectural damage commonly applied to construction activities is a peak particle velocity (ppv) of 0.3 inches per second (in/sec) for fragile structures and 0.5 in/sec ppv for newer structures. Levels above 0.2 in/sec ppv may result in increased levels of annoyance for people in buildings (Caltrans 2013).

Figure 3
Land Use Compatibility Noise Criteria Transportation Noise Sources



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.

CONDITIONALLY ACCEPTABLE
New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements 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.

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

CLEARLY UNACCEPTABLE
New construction or development should generally not be undertaken.

Source: City of El Paso de Robles 2003

Table 3
Summary of Groundborne Vibration Levels and Potential Effects

Vibration Level (in/sec ppv)	Human Reaction	Effect on Buildings
0.006-0.019	Threshold of perception; possibility of intrusion.	Vibrations unlikely to cause damage of any type.
0.08	Vibrations readily perceptible.	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected.
0.10	Level at which continuous vibrations begin to annoy people.	Virtually no risk of "architectural" damage to normal buildings.
0.20	Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relatively short periods of vibrations).	Threshold at which there is a risk of "architectural" damage to fragile buildings.
0.4-0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges.	Potential risk of "architectural" damage may occur at levels above 0.3 in/sec ppv for older residential structures and above 0.5 in/sec ppv for newer structures.

The vibration levels are based on peak particle velocity in the vertical direction for continuous vibration sources, which includes most construction activities, with the exception of transient or intermittent construction activities, such as pile driving. For pile driving, the minimum criterion level is typically considered to be 0.2 in/sec ppv.
Source: Caltrans 2013

AFFECTED ENVIRONMENT

Noise-Sensitive Receptors

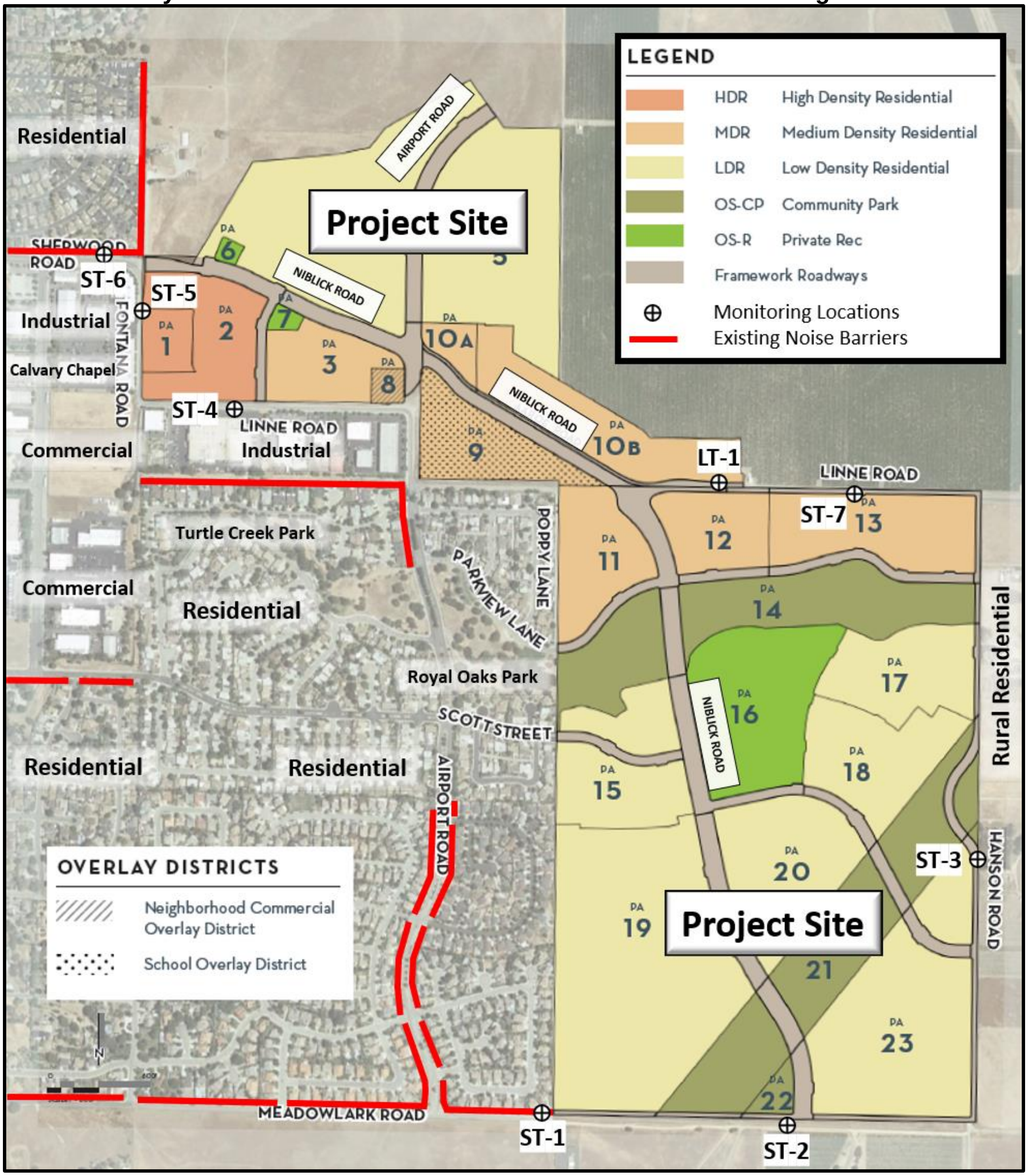
Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Additional land uses such as parks, historic sites, cemeteries, and recreation areas are also considered sensitive to increases in exterior noise levels. Schools, churches, hotels, libraries, and other places where low interior noise levels are essential are also considered noise-sensitive land uses.

The project site is generally located to the north and south of Linne Road, between Fontana Road and Hanson Road. The nearest noise-sensitive land uses consist predominantly of residential dwellings. The nearest residential land uses are located approximately 50 feet northwest of the project site, across Sherwood Road; approximately 35 feet to the east, across Hanson Road; approximately 25 feet to the south, across Meadowlark Road; and approximately 20 feet to the west, across Poppy Lane. Additional noise-sensitive land uses include Royal Oaks Park, Turtle Creek Park, and Calvary Chapel. Nearby noise-sensitive land uses are depicted in Figure 4.

Ambient Noise Environment

To document existing ambient noise levels at the project site, seven short-term (i.e., 10 minutes) and one long-term (i.e., 24-hour) ambient noise measurements were conducted. Ambient noise levels were primarily influenced by vehicular traffic on area roadways. No nearby stationary sources of noise were detectable at the project site. Noise measurements were conducted using a Larson Davis Laboratories, Type I, Model 820 integrating sound-level meter positioned at a height of approximately 5 feet above ground level from approximately 10 to 37 feet from the centerline of nearby roadways. The long-term noise measurement was conducted at approximately 15 feet from the road centerline of Linne Road. Noise measurement locations are depicted in Figure 4. Measured short-term ambient noise levels are summarized in Table 4. Measured long-term noise levels are depicted in Figure 5.

Figure 4
Nearby Noise-Sensitive Land Uses & Ambient Noise Monitoring Locations



Note: Not to Scale. All locations are approximate. Refer to Table 4 for noise measurement data.

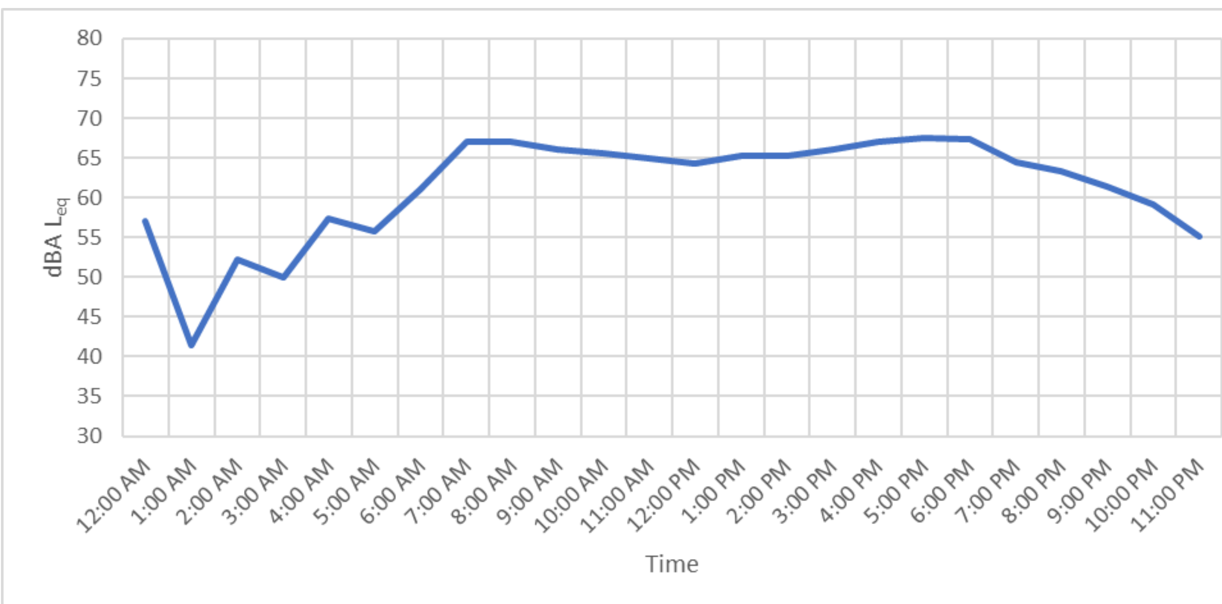
Table 4
Summary of Measured Short-Term Ambient Noise Levels

Monitoring Location	Monitoring Period	Monitoring Location	Noise Level (dBA)	
			L_{eq}	L_{max}
ST-1	1230-1240	Meadowlark Road near Airport Road, approximately 24 feet from the road centerline.	51.0	73.9
ST-2	1300-1310	Meadowlark Road, approximately 10 feet from the road centerline.	50.2	73.0
ST-3	1320-1330	Hanson Road, approximately 20 feet from the road centerline.	49.9	69.2
ST-4	1340-1350	Linne Road near Fontana Road, approximately 20 feet from the road centerline.	67.7	84.0
ST-5	1445-1455	Fontana Road near Sherwood Road, approximately 22 feet from the road centerline.	67.3	79.1
ST-6	1520-1530	Sherwood Road near Fontana Road, approximately 37 feet from the road centerline.	65.3	81.0
ST-7	1540-1550	Linne Road near Hanson Road, approximately 15 feet from the road centerline.	70.6	80.7

Noise measurement survey was conducted on January 30th and February 1st, 2019 using a Larson Davis Laboratories, Type I, Model 820 integrating sound-level meter positioned at a height of approximately 5 feet above ground level. Refer to Figure 4 for noise measurement locations.

As indicated in Table 4, measured ambient noise levels at various locations in the project area ranged from approximately 50 to 71 dBA L_{eq} during the daytime hours. Instantaneous noise levels measured during the daytime hours ranged from approximately 69 to 84 dBA L_{max}. Average hourly noise levels measured over a 24-hour period along Linne Road are depicted in Figure 5. As shown in Figure 5, the highest average hourly noise levels occurred during the peak morning and late-afternoon commute hours. In general, noise levels during the evening and night-time hours are roughly 10 dBA below daytime noise levels.

Figure 5
Measured Long-Term Ambient Noise Levels Along Linne Road



Noise measurement was conducted on February 6th, 2019 from approximately 15 feet from the road centerline of Linne Road near Aaroe Road. Refer to Figure 4 for noise measurement location.

Existing Traffic Noise Levels

As noted above, vehicle traffic on area roadways is the primary source of noise in the project area. Calculated existing traffic noise levels at 50 feet from the near-travel-lane centerline and distances to existing noise contours for area roadways are summarized in Table 5. Existing noise barriers are located along Sherwood Road, Airport Road, Scott Street, and Meadowlark Road. These existing noise barriers range in height from approximately 5.5 to 10 feet. Existing noise barrier locations are depicted in Figure 4. As shown in Table 5, existing traffic noise levels range from approximately 41 to 69 dBA CNEL/L_{dn} at 50 feet from the near-travel-lane centerline.

Table 5
Predicted Existing Traffic Noise Levels

Roadway Segment	Noise Level (dBA CNEL)				
	at 50 Feet from Near-Travel-Lane Centerline	Distance (Feet) to CNEL/L_{dn} Contours From Roadway Centerline			
		70	65	60	55
Union Road, Priska Drive to Kit Fox Lane	61.0	WR	WR	66	141
Creston Road, East of Ferro Lane	66.3	WR	68	145	313
Creston Road, East of Golden Hill Road	64.1	WR	65	133	282
Creston Road, South of Niblick Road	64.4	WR	68	140	298
Creston Road, North of Meadowlark Road	62.0	WR	WR	76	163
Golden Hill Road, South of Union Road	66.8	WR	89	188	404
Golden Hill Road, North of Union Road	66.2	WR	74	158	340
Niblick Road, East of Spring Street	68.8	63	128	273	585
Niblick Road, East of Quarterhorse Lane	67.1	WR	100	211	452
Sherwood Road, East of Creston Road	64.0	WR	64	131	278
Linne Road, Poppy Lane to Hanson Road	60.3	WR	WR	58	125
Parkview Lane, East of Airport Road	44.7	WR	WR	WR	WR
Scott Street, East of Airport Road	44.5	WR	WR	WR	WR
Linne Road, Fontana Road to Airport Road	57.5	WR	WR	WR	82
Poppy Lane, South of Linne Road	40.7	WR	WR	WR	WR
Hanson Road, Linne Road to Meadowlark Road	40.7	WR	WR	WR	WR
Meadowlark Road, West of Hanson Road	41.9	WR	WR	WR	WR

Traffic noise levels were calculated using the FHWA roadway noise prediction model based on traffic data obtained from the traffic analysis prepared for this project. WR = Within Road Right-of-Way

IMPACTS AND MITIGATION MEASURES

Significance Criteria

Criteria for determining the significance of noise impacts were developed based on information contained in the California Environmental Quality Act Guidelines (CEQA Guidelines, Appendix G). According to the guidelines, a project may have a significant effect on the environment if it would result in the following conditions:

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

b) Generation of excessive groundborne vibration or groundborne noise levels.

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

Short-Term Construction Noise Impacts

The City has not adopted noise standards that apply to short-term construction activities. However, based on screening noise criteria commonly recommended by federal agencies, construction activities would generally be considered to have a potentially significant impact if average daytime noise levels would exceed 90 dBA L_{eq} when averaged over a 1-hour period ($L_{eq}^{(1)}$), or 80 dBA L_{eq} when averaged over an 8-hour period ($L_{eq}^{(8)}$) (FTA 2018). Because some activities may not occur over a full 8-hour day and to be conservative, construction-generated noise levels would be considered to have a potentially significant impact if predicted noise levels at noise-sensitive land uses would exceed 80 dBA L_{eq} when averaged over an 1-hour period.

Long-Term Operational Noise Impacts

For purposes of this analysis, a substantial increase in noise levels is defined as an increase of 3 dBA, or greater. Substantial increases in ambient noise levels at existing land uses that would exceed applicable City noise standards would be considered to have a potentially significant impact.

The *CEQA Guidelines* do not define the levels at which increases in ambient noise would be considered "substantial." As discussed previously in this section, a noise level increase of 3 dBA is barely perceptible to most people, a 5 dBA increase is readily noticeable, and a difference of 10 dBA would be perceived as a doubling of loudness. For purposes of this analysis, a substantial increase in ambient noise levels would be defined as an increase of 3 dBA, or greater. Substantial increases in ambient noise levels that would exceed applicable noise standards for existing land uses would be considered to have a potentially significant impact. For existing land uses, a substantial increase in ambient noise and exposure to transportation noise levels in excess of 65 dBA CNEL/L_{dn} within outdoor activity areas or 45 dBA CNEL/L_{dn} within interior areas would be considered a potentially significant impact. The compatibility of the proposed land uses were evaluated based on predicted future on-site noise conditions and in comparison to the City's noise exposure standards for determination of impact significance (refer to Figure 3).

Exposure to non-transportation noise sources would be considered potentially significant if noise levels would exceed the City's noise exposure standards for non-transportation noise sources (refer to Table 2).

Groundborne Vibration Impacts

The *CEQA Guidelines* also do not define the levels at which groundborne vibration levels would be considered excessive. For this reason, Caltrans' recommended groundborne vibration thresholds were used for the evaluation of impacts based on increased potential for structural damage and human annoyance, as identified in Table 3. Based on these levels, groundborne vibration levels would be considered to have a potentially significant impact with regard to potential structural damage if levels would exceed a 0.5 in/sec ppv.

Methodology

Short-Term Construction Noise

Short-term noise impacts associated with construction activities were analyzed based on typical construction equipment noise levels derived from the Federal Highway Administration (FHWA) *Roadway Construction Noise Model* and the Federal Transit Administration's (FTA) *Transit Noise and Vibration Impact Assessment Manual*. Typical equipment use for various phases of construction were based on default assumptions identified in the *California Emissions Estimator Model* (CAPCOA 2018) for representative development projects. Predicted average-hourly construction noise levels (in dBA L_{eq}) was calculated assuming the two loudest pieces of construction equipment operating simultaneously at 50 feet from source center (FTA 2018). Noise levels were predicted based on an average noise-attenuation rate of 6 dB per doubling of distance from the source.

Long-term Operational Noise

Traffic noise levels were calculated using the Federal Highway Administration (FHWA) roadway noise prediction model (FHWA-RD-77-108) based on California vehicle reference noise levels and traffic data obtained from the traffic analysis prepared for this project. Additional input data included day/night percentages of autos, medium and heavy trucks, vehicle speeds, ground attenuation factors, and roadway widths. The project's contribution to traffic noise levels along area roadways was determined by comparing the predicted noise levels with and without project-generated traffic. To be conservative, noise impacts were analyzed for the proposed 1,293 unit plus school project, given that this scenario would have the potential to generate higher traffic volumes on area roadways. Predicted noise levels associated with on-site non-transportation noise sources were calculated based on representative data obtained from similar land uses and existing literature.

Impact Discussions and Mitigation Measures

IMPACT A.	**Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.**

LONG-TERM NOISE EXPOSURE

Increases in Traffic Noise Levels

Implementation of the proposed project would result in increased traffic volumes on area roadways. The increase in traffic volumes resulting from implementation of the proposed project would, therefore, contribute to increases in traffic noise levels. Predicted traffic noise levels for existing, near-term (year 2025), and future cumulative conditions (year 2045), with and without implementation of the proposed project, are discussed, as follows.

Existing Conditions

Predicted increases in traffic noise levels for existing conditions, with and without implementation of the proposed project, are depicted in Table 6. As depicted, existing increases in traffic noise levels along area roadways attributable to the proposed project would range from approximately 0.2 to 12.6 dBA CNEL/L_{dn}. As noted in Table 6, the proposed project would result in a substantial increase (i.e., 3 dBA, or greater) in existing traffic noise levels at existing noise-sensitive land uses located along Scott Street, east of Airport Road; Hanson Road, from Linne Road to Meadowlark Road; and Meadowlark Road, west of Hanson Road. However, predicted traffic noise levels at existing residential land uses located along these roadway segments would not be projected to exceed the City's exterior or interior noise standards of 65 and 45 dBA CNEL/L_{dn}, respectively. As a result, this impact is considered less than significant.

Near-Term Conditions

Predicted increases in traffic noise levels for near-term conditions, with and without implementation of the proposed project, are depicted in Table 7. As depicted, near-term increases in traffic noise levels along area roadways attributable to the proposed project would range from approximately 0.2 to 8.7 dBA CNEL/L_{dn}. As noted in Table 7, the proposed project would result in a substantial increase (i.e., 3 dBA, or greater) in near-term traffic noise levels at existing noise-sensitive land uses located along Scott Street, east of Airport Road; Hanson Road, from Linne Road to Meadowlark Road; and Meadowlark Road, west of Hanson Road. However, predicted traffic noise levels at existing residential land uses located along these roadway segments would not be projected to exceed the City's exterior or interior noise standards of 65 and 45 dBA CNEL/L_{dn}, respectively. As a result, this impact is considered less than significant.

Table 6
Predicted Increases in Traffic Noise Levels – Existing Conditions

Roadway Segment	Noise Level (dBA CNEL/L_{dn}) at 50 Feet From Near-Travel-Lane Centerline			Significant Impact?[1]
	Existing without Specific Plan	Existing with 1,293-Unit+School Specific Plan	Change	
Union Road, Priska Drive to Kit Fox Lane	61.0	61.0	0.0	No
Creston Road, East of Ferro Lane	66.3	66.5	0.2	No
Creston Road, East of Golden Hill Road	64.1	65.0	0.9	No
Creston Road, South of Niblick Road	64.4	64.7	0.3	No
Creston Road, North of Meadowlark Road	62.0	62.6	0.6	No
Golden Hill Road, South of Union Road	66.8	67.4	0.6	No
Golden Hill Road, North of Union Road	66.2	66.8	0.6	No
Niblick Road, East of Spring Street	68.8	69.3	0.5	No
Niblick Road, East of Quarterhorse Lane	67.1	68.0	0.9	No
Sherwood Road, East of Creston Road	64.0	66.7	2.7	No
Linne Road, Poppy Lane to Hanson Road	60.3	63.1	2.8	No
Parkview Lane, East of Airport Road	44.7	46.5	1.8	No
Scott Street, East of Airport Road	44.5	50.4	5.9	No
Linne Road, Fontana Road to Airport Road [3]	57.5	54.0	-3.5	No
Poppy Lane, South of Linne Road	40.7	40.7	0.0	No
Hanson Road, Linne Road to Meadowlark Road	40.7	49.4	8.7	No
Meadowlark Road, West of Hanson Road	41.9	54.5	12.6	No

Note: Traffic noise levels were calculated using the FHWA roadway noise prediction model based on traffic data obtained from the traffic analysis prepared for this project.

1. A significant impact is defined as a substantial increase (i.e., 3 dB, or greater) in traffic noise levels that would exceed the City's exterior noise standard of 65 dBA CNEL/L_{dn}. Assuming a minimum exterior-to-interior noise reduction of 20 dB (with windows closed), an exterior noise level standard of 65 dBA CNEL/L_{dn} would equate to an interior noise level of 45 dBA L_{eq}.

2. For existing land uses, exposure to transportation noise levels in excess of 65 dBA CNEL/L_{dn} within outdoor activity areas or 45 dBA CNEL/L_{dn} within interior areas would be considered an exceedance. Assuming a minimum exterior-to-interior noise reduction of 20 dB, a maximum exterior noise standard of 65 dBA CNEL/L_{dn} would provide for an interior noise level of 45 dBA CNEL/L_{dn}, or less.

3. Reductions in traffic noise levels are due to changes in vehicle distribution patterns that would occur with project implementation.

Table 7
Predicted Increases in Traffic Noise Levels – Near-Term Conditions

Roadway Segment	Noise Level (dBA CNEL/L_{dn}) at 50 Feet From Near-Travel-Lane Centerline			Significant Impact?[1]
	Near-Term without Specific Plan	Near-Term with 1,293-Unit+School Specific Plan	Change	
Union Road, Priska Drive to Kit Fox Lane	61.4	61.4	0.0	No
Creston Road, East of Ferro Lane	66.6	66.8	0.2	No
Creston Road, East of Golden Hill Road	64.7	65.5	0.8	No
Creston Road, South of Niblick Road	65.5	65.7	0.2	No
Creston Road, North of Meadowlark Road	64.5	64.8	0.3	No
Golden Hill Road, South of Union Road	67.4	67.9	0.5	No
Golden Hill Road, North of Union Road	66.8	67.3	0.5	No
Niblick Road, East of Spring Street	69.4	69.8	0.4	No
Niblick Road, East of Quarterhorse Lane	67.5	68.3	0.8	No
Sherwood Road, East of Creston Road	64.9	67.2	2.3	No
Linne Road, Poppy Lane to Hanson Road	61.6	63.9	2.3	No
Parkview Lane, East of Airport Road	45.0	46.8	1.8	No
Scott Street, East of Airport Road	44.9	50.5	5.6	No
Linne Road, Fontana Road to Airport Road[3]	58.4	54.0	-4.4	No
Poppy Lane, South of Linne Road	40.7	40.7	0.0	No
Hanson Road, Linne Road to Meadowlark Road	40.7	49.4	8.7	No
Meadowlark Road, West of Hanson Road	47.9	55.2	7.3	No

Note: Traffic noise levels were calculated using the FHWA roadway noise prediction model based on traffic data obtained from the traffic analysis prepared for this project.

1. A significant impact is defined as a substantial increase (i.e., 3 dB, or greater) in traffic noise levels that would exceed the City's exterior noise standard of 65 dBA CNEL/L_{dn}. Assuming a minimum exterior-to-interior noise reduction of 20 dB (with windows closed), an exterior noise level standard of 65 dBA CNEL/L_{dn} would equate to an interior noise level of 45 dBA L_{eq}.

2. For existing land uses, exposure to transportation noise levels in excess of 65 dBA CNEL/L_{dn} within outdoor activity areas or 45 dBA CNEL/L_{dn} within interior areas would be considered an exceedance. Assuming a minimum exterior-to-interior noise reduction of 20 dB, a maximum exterior noise standard of 65 dBA CNEL/L_{dn} would provide for an interior noise level of 45 dBA CNEL/L_{dn}, or less.

3. Reductions in traffic noise levels are due to changes in vehicle distribution patterns that would occur with project implementation.

Future Cumulative Conditions

Predicted increases in traffic noise levels for future cumulative conditions, with and without the development of the proposed project, are depicted in Table 8. As depicted in Table 8, increases in traffic noise levels along area roadways attributable to the proposed project would range from approximately 0.1 to 8.0 dBA CNEL/L_{dn}. The proposed project would result in a substantial increase (i.e., 3 dBA, or greater) in future cumulative traffic noise levels along Scott Street, east of Airport Road; Hanson Road, from Linne Road to Meadowlark Road; and Meadowlark Road, west of Hanson Road. However, predicted traffic noise levels at existing residential land uses located along these roadway segments would not be projected to exceed the City's exterior or interior noise standards of 65 and 45 dBA CNEL/L_{dn}, respectively. As a result, this impact is considered less than significant.

Table 8
Predicted Increases in Traffic Noise Levels – Future Cumulative Conditions

Roadway Segment	Noise Level (dBA CNEL/L_{dn}) at 50 Feet From Near-Travel-Lane Centerline			Significant Impact?[1]
	Cumulative without Specific Plan	Cumulative with 1,293-Unit+School Specific Plan	Change	
Union Road, Priska Drive to Kit Fox Lane	63.1	63.3	0.2	No
Creston Road, East of Ferro Lane	67.0	67.2	0.2	No
Creston Road, East of Golden Hill Road	65.7	66.0	0.3	No
Creston Road, South of Niblick Road	65.8	65.9	0.1	No
Creston Road, North of Meadowlark Road	64.7	64.9	0.2	No
Golden Hill Road, South of Union Road	68.5	68.8	0.3	No
Golden Hill Road, North of Union Road	69.3	69.5	0.2	No
Niblick Road, East of Spring Street	69.5	69.8	0.3	No
Niblick Road, East of Quarterhorse Lane	68.3	68.9	0.6	No
Sherwood Road, East of Creston Road	66.7	68.0	1.3	No
Linne Road, Poppy Lane to Hanson Road	62.1	64.5	2.4	No
Parkview Lane, East of Airport Road	47.1	48.2	1.1	No
Scott Street, East of Airport Road	46.9	50.6	3.7	No
Linne Road, Fontana Road to Airport Road[3]	60.3	55.4	-4.9	No
Poppy Lane, South of Linne Road	40.7	40.7	0.0	No
Hanson Road, Linne Road to Meadowlark Road	41.5	49.5	8.0	No
Meadowlark Road, West of Hanson Road	48.9	54.1	5.2	No

Note: Traffic noise levels were calculated using the FHWA roadway noise prediction model based on traffic data obtained from the traffic analysis prepared for this project.

1. A significant impact is defined as a substantial increase (i.e., 3 dB, or greater) in traffic noise levels that would exceed the City's exterior noise standard of 65 dBA CNEL/L_{dn}. Assuming a minimum exterior-to-interior noise reduction of 20 dB (with windows closed), an exterior noise level standard of 65 dBA CNEL/L_{dn} would equate to an interior noise level of 45 dBA L_{eq}.

2. For existing land uses, exposure to transportation noise levels in excess of 65 dBA CNEL/L_{dn} within outdoor activity areas or 45 dBA CNEL/L_{dn} within interior areas would be considered an exceedance. Assuming a minimum exterior-to-interior noise reduction of 20 dB, a maximum exterior noise standard of 65 dBA CNEL/L_{dn} would provide for an interior noise level of 45 dBA CNEL/L_{dn}, or less.

3. Reductions in traffic noise levels are due to changes in vehicle distribution patterns that would occur with project implementation.

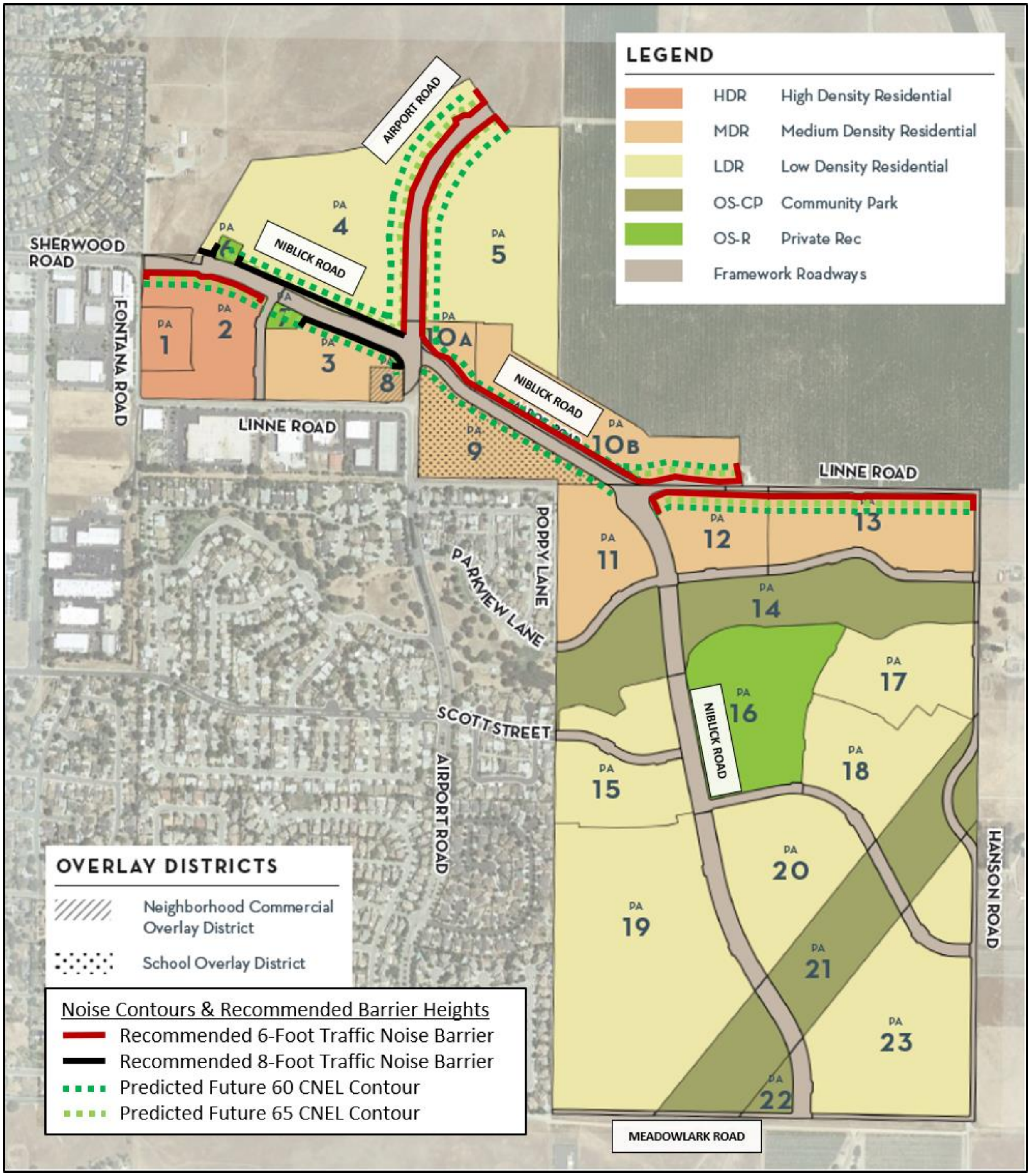
Compatibility with City's Noise Standards for Land Use Compatibility

The compatibility of the proposed land uses was evaluated based on a comparison of projected on-site future cumulative traffic noise levels with applicable City noise standards (refer to Figure 3). To be conservative, this analysis includes development of the proposed school site, which would result in slightly higher traffic noise levels along some roadway segments. As noted in Figure 3, the City's General Plan establishes a "normally acceptable" exterior noise standard of 60 dBA CNEL/L_{dn} for new single-family residential, 65 dBA CNEL/L_{dn} for new multi-family residential and schools, and 70 dBA CNEL/L_{dn} for new neighborhood parks and commercial land uses. Higher noise levels are allowed provided that noise-reduction features have been incorporated.

For land use compatibility, predicted traffic noise levels at proposed land uses were quantified based on future cumulative (year 2045) traffic conditions. Planned on-site land uses and projected on-site future cumulative traffic noise contours with implementation of the proposed project are depicted in Figure 6 and summarized in Table 9. As noted in Table 9, the predicted on-site 60 dBA CNEL/L_{dn} traffic noise contours would extend to approximately 112 feet from the centerline of Linne Road, between Poppy Lane and Hanson Road; 128 feet from Sherwood Road, east of Fontana Road; 129 feet from Airport Road, north of Sherwood Road;

and 77 feet from Aaroe Road, north of Linne Road. The predicted 65 dBA CNEL/L_{dn} on-site traffic noise contours would extend to approximately 52 feet from the centerline of Linne Road, between Poppy Lane and Hanson Road; 60 feet from Sherwood Road, east of Fontana Road; and 64 feet from Airport Road, north of Sherwood Road.

Figure 6
Predicted Future Cumulative Plus Project On-Site
Traffic Noise Contours & Recommended Traffic Noise Barrier Locations



Note: Not to scale. All locations are approximate.

Table 9
Predicted Future Cumulative Plus Project
Traffic Noise Levels & Distances to Traffic Noise Contours

Roadway Segment	Predicted CNEL/L_{dn} at 50 Feet From Near-Travel-Lane Centerline	Distance (Feet) to CNEL/L_{dn} Contours From Roadway Centerline		
		70	65	60
Linne Road, Poppy Lane to Hanson Road	64.5	WR	52	112
Parkview Lane, East of Airport Road	48.2	WR	WR	WR
Scott Street, East of Airport Road	50.6	WR	WR	WR
Linne Road, Fontana Road to Airport Road	55.4	WR	WR	WR
Poppy Lane, South of Linne Road	40.7	WR	WR	WR
Hanson Road, Linne Road to Meadowlark Road	49.5	WR	WR	WR
Meadowlark Road, West of Hanson Road	54.1	WR	WR	WR
Niblick Road, East of Fontana Road	64.8	WR	60	128
Airport Road, North of Niblick Road	63.9	WR	64	129
Niblick Road, Airport Road to Linne Road	61.5	WR	WR	77
Niblick Road, South of Linne Road	58.0	WR	WR	WR
WR = Within Road Right-of-Way				

Predicted future cumulative traffic noise levels at the nearest proposed on-site residential land uses are summarized in Table 10. Under future cumulative conditions with implementation of the proposed project, predicted on-site noise levels at the nearest proposed residential land uses would exceed 60 dBA CNEL/L_{dn} along Linne Road, between Poppy Lane and Hanson Road; Niblick Road, east of Fontana Road; Airport Road, north of Niblick Road; and Niblick Road, between Airport Road and Linne Road. Depending on the setback distances of future residential land uses located along area roadways, predicted future cumulative traffic noise levels at the proposed single-family and multi-family residential land uses could potentially exceed the City's "normally acceptable" land use compatibility noise standards of 60 and 65 dBA CNEL/L_{dn}, respectively. Predicted onsite traffic noise levels at the proposed school would not be projected to exceed the City's "normally acceptable" land use compatibility noise standard of 65 dBA CNEL/L_{dn}. Predicted onsite traffic noise levels at the proposed neighborhood parks and commercial land uses would not be projected to exceed the City's "normally acceptable" land use compatibility noise standard of 70 dBA CNEL/L_{dn}. Future cumulative noise levels at the proposed residential land uses could potentially exceed the City's noise standards. As a result, this impact is considered potentially significant.

Table 10
Predicted Future Cumulative Plus Project
Traffic Noise Levels at Nearest On-Site Residential Land Uses

Roadway Segment	Minimum Setback Distance (feet) from Roadway Centerline[1]	Predicted CNEL/Ldn at Nearest On-Site Residential Land Use	
		Without Noise Barriers	With Noise Barriers
Linne Road, Poppy Lane to Hanson Road[2]	48	64.7	59.7
Parkview Lane, East of Airport Road	31	50.3	NA[4]
Scott Street, East of Airport Road	31	52.7	NA[4]
Linne Road, Fontana Road to Airport Road	24	58.6	NA[4]
Poppy Lane, South of Linne Road	13	46.6	NA[4]
Hanson Road, Linne Road to Meadowlark Road	48	49.7	NA[4]
Meadowlark Road, West of Hanson Road	48	54.3	NA[4]
Niblick Road, East of Fontana Road[3]	45	65.3	59.3
Airport Road, North of Niblick Road[2]	57	63.3	58.3
Niblick Road, Airport Road to Linne Road[2]	50	61.5	56.5
Niblick Road, South of Linne Road	50	58.0	NA[4]

1. *Setback distance is approximate based on distances derived from roadway profiles (Wallace Group 2019).*
2. *Assumes a barrier height of 6 feet.*
3. *Assumes a barrier height of 8 feet.*
4. *Noise barriers are not required.*

Mitigation Measure Noise-1:

The City shall require acoustical assessments to be prepared as part of the environmental review process for future land use development projects where noise-sensitive land uses are located within the projected future 60 dBA CNEL/L_{dn} noise contour of area roadways for single-family residential, or the projected future 65 dBA CNEL/L_{dn} noise contour of area roadways for multi-family residential (refer to Figure 6 and Table 9). Where the acoustical analysis determines that predicted future traffic noise levels would exceed applicable City noise standards, noise-reduction measures shall be incorporated sufficient to reduce operational noise levels to below the City's "normally acceptable" exterior noise standards of 60 dBA CNEL/L_{dn} for single-family residential and 65 dBA CNEL/L_{dn} for multi-family residential. Such measure may include but are not limited to, the incorporation of setbacks or noise barriers. The emphasis of such measures shall be placed upon site planning and project design. Noise barriers may consist of walls, earthen berms, or a combination of the two. Barrier walls should be constructed of masonry block, or material of similar density and usage, with no visible air gaps at the base of the barrier or between construction materials.

Significance after Mitigation

Implementation of Mitigation Measure Noise-1 would require the incorporation of noise-reduction features sufficient to achieve the City's transportation noise standards for residential land uses. Such measures may include, but are not limited to, the installation of noise barriers or increased setback distances for single-family or multi-family residential land uses located within the predicted 60 and 65 dBA CNEL/L_{dn} roadway noise contours, respectively. These roadways include the segments of Niblick Road, Airport Road, and Linne Road (refer to Table 10). Assuming that noise barriers were to be installed, recommended minimum barrier heights would vary between 6 to 8 feet above the roadway/site ground elevations for single and multi-family residential proposed along the roadways listed above (refer to Figure 6 for recommended barrier locations and heights). It is important to note that actual barrier heights and locations may vary depending on final site design and setback distances.

As noted in Table 10, implementation of recommended noise barriers would reduce predicted future cumulative exterior noise levels to approximately 60 dBA CNEL/L_{dn}, or less. With mitigation, predicted onsite noise levels would not exceed the City's noise standards. This impact would be considered less than significant with implementation of Mitigation Measure Noise-1.

Exposure to Non-Transportation Noise Levels

The proposed project includes the development of residential, commercial, community park/open space, private recreation, and school. The land uses would result in non-transportation noise sources that could potentially exceed the City's applicable noise standards at nearby noise-sensitive land uses. Noise levels typically associated with these land use and associated noise impacts are discussed separately below.

Residential Land Uses

Noise associated with proposed residential dwellings would expose other nearby residences (both existing and project related) to increases in ambient noise levels. Noise typically associated with such development includes lawn and garden equipment, voices, air conditioning equipment, and amplified music. HVAC equipment may be included in the residential developments and the generation of significant noise may occur depending on proximity to existing residences located west of PA-11, PA-15, and PA-19 (refer to Figure 3) Noise generated by the proposed residential land uses would result in increases in ambient noise levels, primarily during the day and evening hours and less frequently at night. As a result, increased noise levels associated with proposed residential land uses would be considered a potential significant impact.

Recreational Land Uses

Noise typically associated with neighborhood parks, pools, fitness center, and open space areas are typically limited to the voices of adults and children and the occasional opening and closing of vehicle doors. Noise events are typically sporadic and limited primarily to the daytime hours of operation. Parks and open space areas/corridors are typically considered to be an accepted land use within residential developments and generally do not result in noise events that are uncharacteristic of typical residential noise environments. In addition, some recreational uses, such as pools and fitness centers, may incorporate a public address (PA) system. Depending on the location of the PA system and speaker orientation, significant increases in ambient noise levels in excess of the City's noise standards at nearby noise-sensitive land uses could potentially occur. For these reasons, noise-generated by the proposed pool and fitness center land uses would be considered to have a potential significant impact.

Commercial Land Uses

Noise sources commonly associated with commercial uses include building mechanical systems (e.g., HVAC systems), back-up power generators, and loading dock activities. Noise levels associated with building mechanical systems, such as larger air conditioning units, can range from 60 to 79 dBA L_{eq} at 5 feet. Back-up power generators can generate noise levels of approximately 79 dBA L_{eq} at 50 feet (FTA 2018. FHWA 2008). Based on measurements conducted at various commercial uses, noise levels associated with loading dock operations and material handling activities can generate noise levels of approximately 70 dBA L_{eq} at 50 feet. Assuming a maximum noise level of 79 dBA L_{eq} at 50 feet, predicted operational noise levels within approximately 825 feet of commercial land uses could exceed 45 dBA L_{eq}.

Depending on the specific uses proposed, site design, and hours of operation predicted noise levels associated with proposed commercial land uses could potentially exceed the City's stationary noise source standards at nearby noise-sensitive land uses (refer to Table 2). Areas where commercial and residential development would occur in close proximity, such as planned mixed-use development, would be of particular concern. As a result, noise generated by planned commercial uses would be considered a potentially significant impact.

Educational Land Uses

Noise generated by small playgrounds typically includes elevated children's voices and occasional adult voices. Based on measurement data obtained from similar land uses, noise levels associated with small playgrounds and recreation areas can generate intermittent noise levels of approximately 55-60 dBA L_{eq} at 50 feet. Other noise sources commonly associated with schools, include building mechanical equipment, parking lots, and exterior PA system speakers. Building mechanical equipment is typically located within the structure, enclosed, or placed on rooftop areas away from direct public exposure. Exterior PA systems and parking areas may result in increases in ambient noise levels at nearby land uses. Noise generated by onsite noise sources would be predominantly limited to the daytime hours of operations. Depending on the location of onsite noise sources, such as playgrounds, PA systems, parking lots, and building mechanical equipment, predicted operational noise levels at the nearest residential land uses (across from PA-9) could potentially exceed the City's noise standards. As a result, noise generated by the planned school land use would be considered a potentially significant impact.

Mitigation Measure Noise-2:

The City shall require acoustical assessments to be prepared as part of the environmental review process for future land use development projects where noise-sensitive land uses are located within 825 feet of planned residential, commercial, recreational, or school land uses. The acoustical assessments shall evaluate potential noise impacts attributable to the proposed project, as well as, the compatibility of proposed land uses in comparison to applicable City noise standards for stationary noise sources (refer to Table 2). Where the acoustical analysis determines that stationary-source noise levels would exceed applicable City noise standards, noise-reduction measures shall be incorporated sufficient to reduce operational noise levels to below applicable noise standards. Such measure may include but are not limited to, the incorporation of setbacks, sound barriers, berms, hourly limitations, or equipment enclosures. The emphasis of such measures shall be placed upon site planning and project design.

Significance After Mitigation

In accordance with Mitigation Measure Noise-2, acoustical assessments would be required where proposed noise-sensitive land uses are located within 825 feet of planned residential, commercial, recreational, or school land uses. This mitigation measure would apply to newly proposed stationary noise sources, as well as, proposed noise-sensitive land uses located near existing stationary noise sources. Noise-reduction measures, such as the incorporation of setbacks, sound barriers, berms, hourly limitations, or equipment enclosures, would be required sufficient to demonstrate compliance with the City's maximum allowable noise-exposure standards for stationary noise sources (refer to Table 2). With mitigation, this impact would be considered less than significant.

SHORT-TERM NOISE EXPOSURE

Construction Noise Levels

Construction noise typically occurs intermittently and varies depending upon the nature or phase of construction (e.g., land clearing, grading, excavation, and paving). Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. Although noise ranges are generally similar for all construction phases, the initial site preparation phase tends to involve the most heavy-duty equipment having a higher noise-generation potential. Noise levels associated with individual construction equipment are summarized in Table 11.

Table 11
Construction Equipment Noise Levels

Equipment	Noise Level (dBA) at 50 feet from Source Center	
	L_{max}	L_{eq}
Air Compressor	78	74
Backhoe	78	74
Front End Loader	79	75
Compactor (Ground)	83	76
Concrete Mixer Truck	79	75
Concrete Saw	90	83
Crane	81	73
Dozer	82	78
Grader	85	81
Excavator	81	77
Scraper	84	80
Generator	81	78
Gradall	83	79
Hydraulic Break Ram	90	80
Jack Hammer	89	82
Impact Hammer/Hoe Ram (Mounted)	90	83
Roller	80	73
Paver	77	74
Pneumatic Tools	85	82
Tractor	84	80
Dump Truck	77	73

Based on measured equipment noise levels. Actual noise levels are typically lower, particularly if the equipment is fitted with exhaust mufflers and engine shrouds.
Sources: FTA 2018, FHWA 2008

As depicted in Table 11, maximum noise levels generated by individual pieces of construction equipment typically range from approximately 77 dBA to 90 dBA L_{max} at 50 feet (FTA 2018). Average-hourly noise levels for individual construction equipment generally range from approximately 73 to 83 dBA L_{eq}. Based on these equipment noise levels, equipment commonly associated with community development projects, and assuming the two loudest pieces of equipment operating simultaneously in close proximity, predicted average-hourly noise levels occurring during the loudest phases of construction generally range from approximately 78 to 84 dBA L_{eq} at 50 feet (refer to Table 12). Other construction activities (e.g., painting, landscaping) typically generate lower noise levels (FTA 2018). Short-term increases in vehicle traffic, including worker commute trips and haul truck trips may also result in temporary increases in ambient noise levels at nearby receptors.

Table 12
Typical Construction Phase Equipment & Noise Levels

Construction Phase	Typical Equipment	Noise Level (dBA L_{eq}) at 50 feet from Source Center
Demolition	Concrete Saws, Excavators, Dozers	81
Site Preparation	Dozers, Tractors, Loaders, Backhoes	83
Grading	Dozers, Tractors, Loaders, Backhoes, Graders, Scrapers, Excavators	84
Building Construction/Architectural Coating	Cranes, Forklifts/Gradalls, Tractors, Loaders, Backhoes, Generators, Welders	83
Paving	Pavers, Rollers, Paving Equipment (e.g., Compactors)	78

1. Represents equipment typically associated with community development projects derived from the California Emissions Estimator Model.
2. Based on equipment noise levels identified in Table 10. Assumes the two loudest pieces of equipment operating simultaneously.
Sources: FTA 2018, FHWA 2008, CAPCOA 2016

Depending on the location and types of activities conducted (e.g., building demolition, site preparation, grading), predicted noise levels at the nearest residences, which are located adjacent to and west of the project site, could potentially exceed 80 dBA L_{eq}, particularly when activities occur within approximately 50 feet of the nearest site boundaries. Furthermore, with regard to residential land uses, activities occurring during the more noise-sensitive evening and nighttime hours could result in increased levels of annoyance and potential sleep disruption. For these reasons, noise-generating construction activities would be considered to have a potentially significant short-term noise impact.

Mitigation Measure Noise-3:

a. Unless otherwise provided for in a validly issued permit or approval, noise-generating construction activities should be limited to the hours of 7:00 a.m. and 7:00 p.m. Noise-generating construction activities should not occur on Sundays or City holidays.

b. Construction equipment should be properly maintained and equipped with noise-reduction intake and exhaust mufflers and engine shrouds, in accordance with manufacturers' recommendations. Equipment-engine shrouds should be closed during equipment operation.

c. Equipment shall be turned off when not in use for an excess of five minutes, except for equipment that requires idling to maintain performance.

d. Construction haul truck routes shall be routed away from nearby noise-sensitive land uses, to the extent possible.

e. A public liaison shall be appointed for project construction and shall be responsible for addressing public concerns about construction activities, including excessive noise. The liaison shall work directly with the construction contractor to ensure implementation of the appropriate noise-reduction measures to address public concerns and to ensure that construction-generated noise levels would not exceed commonly applied noise criteria at nearby noise-sensitive land uses (e.g., 80 dBA L_{eq}). Signage shall be posted at the site perimeter identifying the public liaison's contact information.

f. Where necessary, temporary barriers shall be installed where noise-generating construction activities would occur within 50 feet of an occupied noise-sensitive land use. Temporary noise barriers shall be constructed of sound curtains/blankets, wood, or material of similar density and usage, to a minimum height of 6 feet above ground level.

g. Staging and queuing areas shall be located at the furthest distance possible from nearby noise-sensitive land use identified in the project area at the time of construction.

h. Stationary equipment (e.g., generators, compressors) shall be located at the furthest distance possible from nearby noise-sensitive land use identified in the project area at the time of construction.

Significance After Mitigation

With the implementation of Mitigation Measure Noise-3, construction activities would be limited to the less noise-sensitive daytime hours. The proper maintenance of construction equipment and use of manufacturer-recommended mufflers and engine shrouds would reduce equipment noise levels by approximately 10 dB. The installation of temporary noise barriers, where required, would decrease noise level by approximately 5 to 10 dB. With mitigation, average-hourly construction noise levels would be reduced to less than 80 dBA L_{eq} at nearby land uses. With mitigation, this impact would be considered less than significant.

IMPACT B. Generation of excessive groundborne vibration or groundborne noise levels.

Increases in groundborne vibration levels attributable to the proposed project would be primarily associated with short-term construction-related activities. Construction activities associated with the proposed project would likely require the use of various off-road equipment, such as tractors, concrete mixers, and haul trucks.

Groundborne vibration levels associated with representative construction equipment are summarized in Table 13. Based on the vibration levels presented, ground vibration generated by construction equipment would not exceed approximately 0.09 inches per second ppv at 25 feet. Predicted vibration levels at the nearest offsite structures, which are located in excess of 25 feet from the project site, would not exceed 0.5 in/sec ppv at nearby land uses.

In addition, haul trucks traveling along project area roadways may result in perceptible increases in vibration levels. However, these vibration levels would be transient and instantaneous events, which would be typical of existing vibrations along the roadway network. Based on measurements conducted by Caltrans, on-road heavy-duty trucks would not generate substantial increases in groundborne vibration that would be expected to exceed commonly applied criteria for structural damage or annoyance (Caltrans 2013). As a result, this impact would be considered less than significant.

Table 13
Representative Construction Equipment Vibration Levels

Equipment	Vibration Level at 25 ft.	
	Peak Particle Velocity (ppv, in/sec)	VdB (micro-inch/second)
Hoe Ram/Pavement Breaker	0.089	87
Large Bulldozers	0.089	87
Loaded Trucks	0.076	86
Jackhammer	0.035	79
Small Bulldozers	0.003	58
Sources: FTA 2018, Caltrans 2013		

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

The project site is not located within two miles of a public airport or private airstrip. The nearest airport is the Paso Robles Municipal Airport, which is located approximately four miles northeast of the project site. The project site is not located within the 65 dBA CNEL contour of this airport. As a result, the project site is not subject to high levels of aircraft noise. This impact is considered less than significant.

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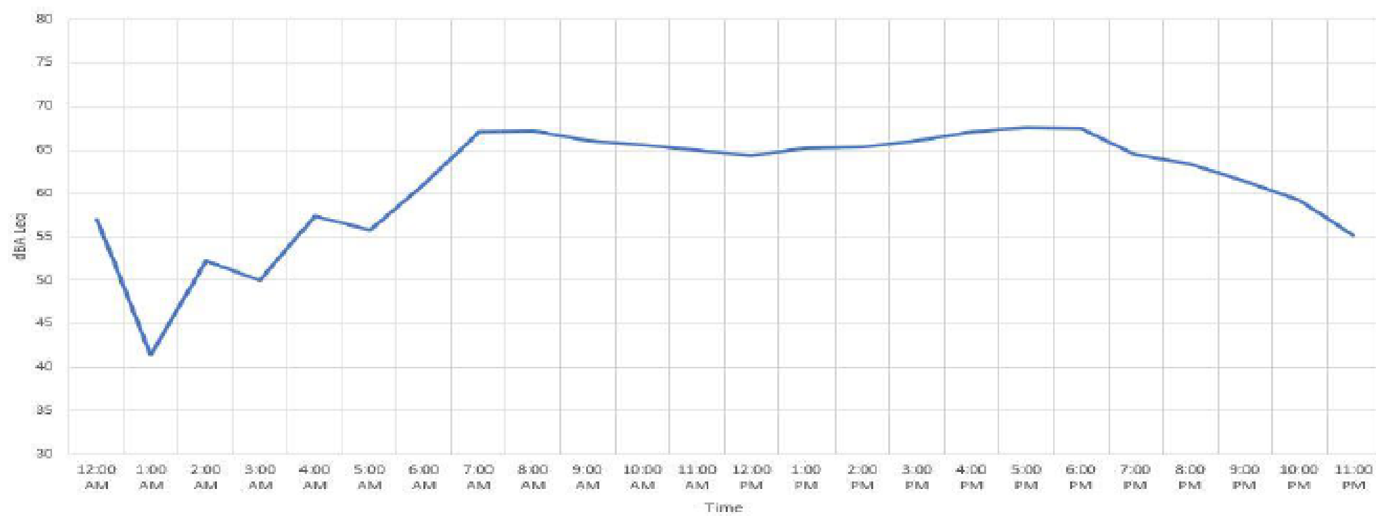
APPENDIX A
AMBIENT NOISE MONITORING SURVEYS

NOISE MEASUREMENT SURVEY FORM

DATE:	January 30th, 2019 & February 1st, 2019	
PROJECT:	Paso Robles - Olsen-Chandler Specific Plan	
NOISE MONITORING LOCATION		Paso Robles
MET CONDITIONS:		TEMP: 53 - 71 F. HUMIDITY: 43 - 79 % WIND SPEED: 6 - 16 MPH SKY: Cloudy GROUND: Dry
NOISE MONITORING EQUIPMENT:		LARSON DAVIS MODEL 820, TYPE I SLM
CALIBRATED PRIOR TO AND UPON COMPLETION OF MEASUREMENTS: YES		

LOCATION	MONITORING PERIOD	NOISE SOURCES NOTED	NOISE LEVEL		
			LEQ	LMIN	LMAX
ST-1 Meadowlark Road, near Airport Road	1230-1240	Vehicle Traffic	51	35.3	73.9
ST-2 Meadowlark Road	1300-1310	Vehicle Traffic	50.2	39.6	73
ST-3 Hanson Road	1320-1330	Vehicle Traffic	49.9	33	69.2
ST-4 Linne Road, near Fontana Road	1340-1350	Vehicle Traffic	67.7	34.3	84
ST-5 Fotana Road, near Sherwood Road	1445-1455	Vehicle Traffic	67.3	47.5	79.1
ST-6 Sherwood Road, near Fontana Road	1520-1530	Vehicle Traffic	65.3	52.2	81
ST-7 Linne Road, near Hanson Road	1540-1550	Vehicle Traffic	70.6	48.1	80.7

LONG-TERM NOISE MEASUREMENT AT LT-1
15 Feet from the Centerline of Linne Road
Measured Noise Level: 66.1 CNEL



APPENDIX B
TRAFFIC NOISE MODELING

TRAFFIC VOLUME SUMMARY

ROADWAY SEGMENT	SEGID	LANES	AHW	SPEED	EXISTING	EXISTING + 1293	EXISTING + 1293 + SCHOOL
					ADT	ADT	ADT
UNION ROAD, PRISKA DRIVE TO KIT FOX LANE	1	2	6	55	1,570	1,570	1,570
CRESTON ROAD, EAST OF FERRO LANE	2	2	6	35	16,049	16,859	16,925
CRESTON ROAD, EAST OF GOLDEN HILL ROAD	3	4	24	35	13,675	16,720	16,964
CRESTON ROAD, SOUTH OF NIBLICK ROAD	4	4	24	35	14,856	15,868	15,952
CRESTON ROAD, NORTH OF MEADOWLARK ROAD	5	4	6	35	6,008	6,921	6,996
GOLDEN HILL ROAD, SOUTH OF UNION ROAD	6	3	18	45	12,676	14,303	14,434
GOLDEN HILL ROAD, NORTH OF UNION ROAD	7	3	12	45	9,805	11,081	11,184
NIBLICK ROAD, EAST OF SPRING STREET	8	4	24	40	29,676	32,907	33,169
NIBLICK ROAD, EAST OF QUARTERHORSE	9	4	24	40	20,115	24,279	24,616
SHERWOOD ROAD, EAST OF CRESTON ROAD	10	4	24	40	9,659	17,421	18,038
LINNE ROAD, POPPY LANE TO HANSON ROAD	11	2	6	55	1,311	2,449	2,543
PARKVIEW LANE, EAST OF AIRPORT ROAD	12	2	6	25	250	370	380
SCOTT STREET, EAST OF AIRPORT ROAD	13	2	6	25	240	880	930
LINNE ROAD, FONTANA TO AIRPORT ROAD	14	2	6	25	4,750	2,080	2,110
POPPY LANE, SOUTH OF LINNE ROAD	15	2	6	25	< 100	< 100	< 100
HANSON ROAD, LINNE ROAD TO MEADOWLARK ROAD	16	2	6	25	100	690	740
MEADOWLARK ROAD, WEST OF HANSON ROAD	17	2	6	25	130	2,220	2,390
NIBLICK ROAD, EAST OF FONTANA ROAD	18	2	12	35	0	10,680	11,180
AIRPORT ROAD, NORTH OF NIBLICK ROAD	19	4	24	35	0	1,560	1,680
NIBLICK ROAD, AIRPORT ROAD TO LINNE ROAD	20	2	12	35	0	4,690	4,940
NIBLICK ROAD, SOUTH OF LINNE ROAD	21	2	12	35	0	1,900	2,040

AHW = ACTIVE HALF WIDTH

ADT = AVERAGE DAILY TRIPS

Source: City of Paso Robles General Plan Circulation Element, 2011; CCTC, 2019.

ROADWAY SEGMENT	SEGID	LANES	AHW	SPEED	NEAR TERM	NT + 1293	NT + 1293 + SCHOOL
					ADT	ADT	ADT
UNION ROAD, PRISKA DRIVE TO KIT FOX LANE	1	2	6	55	1,700	1,700	1,700
CRESTON ROAD, EAST OF FERRO LANE	2	2	6	35	17,400	18,210	18,276
CRESTON ROAD, EAST OF GOLDEN HILL ROAD	3	4	24	35	15,900	18,945	19,189
CRESTON ROAD, SOUTH OF NIBLICK ROAD	4	4	24	35	18,900	19,912	19,996
CRESTON ROAD, NORTH OF MEADOWLARK ROAD	5	4	6	35	10,600	11,513	11,588
GOLDEN HILL ROAD, SOUTH OF UNION ROAD	6	3	18	45	14,500	16,127	16,258
GOLDEN HILL ROAD, NORTH OF UNION ROAD	7	3	12	45	11,300	12,576	12,679
NIBLICK ROAD, EAST OF SPRING STREET	8	4	24	40	33,600	36,831	37,093
NIBLICK ROAD, EAST OF QUARTERHORSE	9	4	24	40	22,000	26,164	26,501
SHERWOOD ROAD, EAST OF CRESTON ROAD	10	4	24	40	12,000	19,762	20,379
LINNE ROAD, POPPY LANE TO HANSON ROAD	11	2	6	55	1,800	2,938	3,032
PARKVIEW LANE, EAST OF AIRPORT ROAD	12	2	6	25	270	390	400
SCOTT STREET, EAST OF AIRPORT ROAD	13	2	6	25	260	900	950
LINNE ROAD, FONTANA TO AIRPORT ROAD	14	2	6	25	5,880	2,080	2,110
POPPY LANE, SOUTH OF LINNE ROAD	15	2	6	25	< 100	< 100	< 100
HANSON ROAD, LINNE ROAD TO MEADOWLARK ROAD	16	2	6	25	100	690	740
MEADOWLARK ROAD, WEST OF HANSON ROAD	17	2	6	25	520	2,610	2,780
NIBLICK ROAD, EAST OF FONTANA ROAD	18	2	12	35	0	11,780	12,280
AIRPORT ROAD, NORTH OF NIBLICK ROAD	19	4	24	35	0	1,560	1,680
NIBLICK ROAD, AIRPORT ROAD TO LINNE ROAD	20	2	12	35	0	5,170	5,420
NIBLICK ROAD, SOUTH OF LINNE ROAD	21	2	12	35	0	1,900	2,040

AHW = ACTIVE HALF WIDTH

ADT = AVERAGE DAILY TRIPS

Source: City of Paso Robles General Plan Circulation Element, 2011; CCTC, 2019.

ROADWAY SEGMENT	SEGID	LANES	AHW	SPEED	CUMULATIVE	CM + 1293	CM + 1293 + SCHOOL
					ADT	ADT	ADT
UNION ROAD, PRISKA DRIVE TO KIT FOX LANE	1	2	6	55	2,500	2,625	2,634
CRESTON ROAD, EAST OF FERRO LANE	2	2	6	35	19,200	19,954	19,983
CRESTON ROAD, EAST OF GOLDEN HILL ROAD	3	4	24	35	20,100	21,561	21,603
CRESTON ROAD, SOUTH OF NIBLICK ROAD	4	4	24	35	20,300	20,750	20,764
CRESTON ROAD, NORTH OF MEADOWLARK ROAD	5	4	6	35	11,200	11,663	11,697
GOLDEN HILL ROAD, SOUTH OF UNION ROAD	6	4	24	45	20,400	21,727	21,737
GOLDEN HILL ROAD, NORTH OF UNION ROAD	7	4	18	45	22,200	23,295	23,312
NIBLICK ROAD, EAST OF SPRING STREET	8	4	24	40	34,300	37,137	37,311
NIBLICK ROAD, EAST OF QUARTERHORSE	9	4	24	40	26,200	29,738	30,008
SHERWOOD ROAD, EAST OF CRESTON ROAD	10	4	24	40	18,200	24,066	24,534
LINNE ROAD, POPPY LANE TO HANSON ROAD	11	2	6	55	2,000	3,383	3,495
PARKVIEW LANE, EAST OF AIRPORT ROAD	12	2	6	25	430	550	560
SCOTT STREET, EAST OF AIRPORT ROAD	13	2	6	25	410	940	970
LINNE ROAD, FONTANA TO AIRPORT ROAD	14	2	6	25	8,980	2,920	2,960
POPPY LANE, SOUTH OF LINNE ROAD	15	2	6	25	< 100	< 100	< 100
HANSON ROAD, LINNE ROAD TO MEADOWLARK ROAD	16	2	6	25	120	710	760
MEADOWLARK ROAD, WEST OF HANSON ROAD	17	2	6	25	660	2,080	2,190
NIBLICK ROAD, EAST OF FONTANA ROAD	18	2	12	35	0	12,760	13,130
AIRPORT ROAD, NORTH OF NIBLICK ROAD	19	4	24	35	0	9,850	10,080
NIBLICK ROAD, AIRPORT ROAD TO LINNE ROAD	20	2	12	35	0	5,790	6,080
NIBLICK ROAD, SOUTH OF LINNE ROAD	21	2	12	35	0	2,570	2,760

AHW = ACTIVE HALF WIDTH

ADT = AVERAGE DAILY TRIPS

Source: City of Paso Robles General Plan Circulation Element, 2011; CCTC, 2019.

TRAFFIC NOISE SUMMARY

EXISTING

ROADWAY SEGMENT	SEGID	NOISE LEVELS				
		CNEL AT 50' FROM NEAR TRAVEL LANE CENTERLINE	70 CNEL	65 CNEL	60 CNEL	55 CNEL
UNION ROAD, PRISKA DRIVE TO KIT FOX LANE	1	61.0	WR	WR	66	141
CRESTON ROAD, EAST OF FERRO LANE	2	66.3	WR	68	145	313
CRESTON ROAD, EAST OF GOLDEN HILL ROAD	3	64.1	WR	65	133	282
CRESTON ROAD, SOUTH OF NIBLICK ROAD	4	64.4	WR	68	140	298
CRESTON ROAD, NORTH OF MEADOWLARK ROAD	5	62.0	WR	WR	76	163
GOLDEN HILL ROAD, SOUTH OF UNION ROAD	6	66.8	WR	89	188	404
GOLDEN HILL ROAD, NORTH OF UNION ROAD	7	66.2	WR	74	158	340
NIBLICK ROAD, EAST OF SPRING STREET	8	68.8	63	128	273	585
NIBLICK ROAD, EAST OF QUARTERHORSE	9	67.1	WR	100	211	452
SHERWOOD ROAD, EAST OF CRESTON ROAD	10	64.0	WR	64	131	278
LINNE ROAD, POPPY LANE TO HANSON ROAD	11	60.3	WR	WR	58	125
PARKVIEW LANE, EAST OF AIRPORT ROAD	12	44.7	WR	WR	WR	WR
SCOTT STREET, EAST OF AIRPORT ROAD	13	44.5	WR	WR	WR	WR
LINNE ROAD, FONTANA TO AIRPORT ROAD	14	57.5	WR	WR	WR	82
POPPY LANE, SOUTH OF LINNE ROAD	15	40.7	WR	WR	WR	WR
HANSON ROAD, LINNE ROAD TO MEADOWLARK ROAD	16	40.7	WR	WR	WR	WR
MEADOWLARK ROAD, WEST OF HANSON ROAD	17	41.9	WR	WR	WR	WR
NIBLICK ROAD, EAST OF FONTANA ROAD	18	0.0	WR	WR	WR	WR
AIRPORT ROAD, NORTH OF NIBLICK ROAD	19	0.0	WR	WR	WR	WR
NIBLICK ROAD, AIRPORT ROAD TO LINNE ROAD	20	0.0	WR	WR	WR	WR
NIBLICK ROAD, SOUTH OF LINNE ROAD	21	0.0	WR	WR	WR	WR

CNEL = COMMUNITY NOISE EQUIVALENT LEVEL

WR = WITHIN ROAD RIGHT-OF-WAY

EXISTING + 1293

ROADWAY SEGMENT	SEGID	NOISE LEVELS				
		CNEL AT 50' FROM NEAR TRAVEL LANE CENTERLINE	70 CNEL	65 CNEL	60 CNEL	55 CNEL
UNION ROAD, PRISKA DRIVE TO KIT FOX LANE	1	61.0	WR	WR	66	141
CRESTON ROAD, EAST OF FERRO LANE	2	66.5	WR	70	150	323
CRESTON ROAD, EAST OF GOLDEN HILL ROAD	3	64.9	WR	73	151	322
CRESTON ROAD, SOUTH OF NIBLICK ROAD	4	64.7	WR	71	146	311
CRESTON ROAD, NORTH OF MEADOWLARK ROAD	5	62.6	WR	WR	83	179
GOLDEN HILL ROAD, SOUTH OF UNION ROAD	6	67.4	WR	96	204	438
GOLDEN HILL ROAD, NORTH OF UNION ROAD	7	66.8	WR	80	172	369
NIBLICK ROAD, EAST OF SPRING STREET	8	69.3	67	137	292	627
NIBLICK ROAD, EAST OF QUARTERHORSE	9	68.0	57	113	239	512
SHERWOOD ROAD, EAST OF CRESTON ROAD	10	66.5	WR	92	192	411
LINNE ROAD, POPPY LANE TO HANSON ROAD	11	63.0	WR	WR	88	189
PARKVIEW LANE, EAST OF AIRPORT ROAD	12	46.4	WR	WR	WR	WR
SCOTT STREET, EAST OF AIRPORT ROAD	13	50.2	WR	WR	WR	WR
LINNE ROAD, FONTANA TO AIRPORT ROAD	14	53.9	WR	WR	WR	WR
POPPY LANE, SOUTH OF LINNE ROAD	15	40.7	WR	WR	WR	WR
HANSON ROAD, LINNE ROAD TO MEADOWLARK ROAD	16	49.1	WR	WR	WR	WR
MEADOWLARK ROAD, WEST OF HANSON ROAD	17	54.2	WR	WR	WR	WR
NIBLICK ROAD, EAST OF FONTANA ROAD	18	63.9	WR	53	111	239
AIRPORT ROAD, NORTH OF NIBLICK ROAD	19	54.6	WR	WR	WR	70
NIBLICK ROAD, AIRPORT ROAD TO LINNE ROAD	20	60.3	WR	WR	65	138
NIBLICK ROAD, SOUTH OF LINNE ROAD	21	56.4	WR	WR	WR	76

CNEL = COMMUNITY NOISE EQUIVALENT LEVEL

WR = WITHIN ROAD RIGHT-OF-WAY

EXISTING + 1293 + SCHOOL

ROADWAY SEGMENT	SEGID	NOISE LEVELS				
		CNEL AT 50' FROM NEAR TRAVEL LANE CENTERLINE	70 CNEL	65 CNEL	60 CNEL	55 CNEL
UNION ROAD, PRISKA DRIVE TO KIT FOX LANE	1	61.0	WR	WR	66	141
CRESTON ROAD, EAST OF FERRO LANE	2	66.5	WR	70	151	324
CRESTON ROAD, EAST OF GOLDEN HILL ROAD	3	65.0	WR	74	152	325
CRESTON ROAD, SOUTH OF NIBLICK ROAD	4	64.7	WR	71	146	312
CRESTON ROAD, NORTH OF MEADOWLARK ROAD	5	62.6	WR	WR	84	180
GOLDEN HILL ROAD, SOUTH OF UNION ROAD	6	67.4	WR	97	205	440
GOLDEN HILL ROAD, NORTH OF UNION ROAD	7	66.8	WR	81	173	372
NIBLICK ROAD, EAST OF SPRING STREET	8	69.3	67	138	293	630
NIBLICK ROAD, EAST OF QUARTERHORSE	9	68.0	57	114	241	517
SHERWOOD ROAD, EAST OF CRESTON ROAD	10	66.7	WR	94	196	420
LINNE ROAD, POPPY LANE TO HANSON ROAD	11	63.1	WR	WR	90	194
PARKVIEW LANE, EAST OF AIRPORT ROAD	12	46.5	WR	WR	WR	WR
SCOTT STREET, EAST OF AIRPORT ROAD	13	50.4	WR	WR	WR	WR
LINNE ROAD, FONTANA TO AIRPORT ROAD	14	54.0	WR	WR	WR	WR
POPPY LANE, SOUTH OF LINNE ROAD	15	40.7	WR	WR	WR	WR
HANSON ROAD, LINNE ROAD TO MEADOWLARK ROAD	16	49.4	WR	WR	WR	WR
MEADOWLARK ROAD, WEST OF HANSON ROAD	17	54.5	WR	WR	WR	52
NIBLICK ROAD, EAST OF FONTANA ROAD	18	64.1	WR	54	115	246
AIRPORT ROAD, NORTH OF NIBLICK ROAD	19	54.9	WR	WR	WR	73
NIBLICK ROAD, AIRPORT ROAD TO LINNE ROAD	20	60.6	WR	WR	67	143
NIBLICK ROAD, SOUTH OF LINNE ROAD	21	56.7	WR	WR	WR	80

CNEL = COMMUNITY NOISE EQUIVALENT LEVEL

WR = WITHIN ROAD RIGHT-OF-WAY

NEAR TERM

ROADWAY SEGMENT	SEGID	NOISE LEVELS				
		CNEL AT 50' FROM NEAR TRAVEL LANE CENTERLINE	70 CNEL	65 CNEL	60 CNEL	55 CNEL
UNION ROAD, PRISKA DRIVE TO KIT FOX LANE	1	61.4	WR	WR	69	149
CRESTON ROAD, EAST OF FERRO LANE	2	66.6	WR	71	153	330
CRESTON ROAD, EAST OF GOLDEN HILL ROAD	3	64.7	WR	71	146	311
CRESTON ROAD, SOUTH OF NIBLICK ROAD	4	65.5	WR	79	163	349
CRESTON ROAD, NORTH OF MEADOWLARK ROAD	5	64.5	WR	52	110	237
GOLDEN HILL ROAD, SOUTH OF UNION ROAD	6	67.4	WR	97	206	442
GOLDEN HILL ROAD, NORTH OF UNION ROAD	7	66.8	WR	82	174	374
NIBLICK ROAD, EAST OF SPRING STREET	8	69.4	68	139	296	636
NIBLICK ROAD, EAST OF QUARTERHORSE	9	67.5	WR	106	224	480
SHERWOOD ROAD, EAST OF CRESTON ROAD	10	64.9	WR	73	150	321
LINNE ROAD, POPPY LANE TO HANSON ROAD	11	61.6	WR	WR	72	154
PARKVIEW LANE, EAST OF AIRPORT ROAD	12	45.0	WR	WR	WR	WR
SCOTT STREET, EAST OF AIRPORT ROAD	13	44.9	WR	WR	WR	WR
LINNE ROAD, FONTANA TO AIRPORT ROAD	14	58.4	WR	WR	WR	94
POPPY LANE, SOUTH OF LINNE ROAD	15	40.7	WR	WR	WR	WR
HANSON ROAD, LINNE ROAD TO MEADOWLARK ROAD	16	40.7	WR	WR	WR	WR
MEADOWLARK ROAD, WEST OF HANSON ROAD	17	47.9	WR	WR	WR	WR
NIBLICK ROAD, EAST OF FONTANA ROAD	18	0.0	WR	WR	WR	WR
AIRPORT ROAD, NORTH OF NIBLICK ROAD	19	0.0	WR	WR	WR	WR
NIBLICK ROAD, AIRPORT ROAD TO LINNE ROAD	20	0.0	WR	WR	WR	WR
NIBLICK ROAD, SOUTH OF LINNE ROAD	21	0.0	WR	WR	WR	WR

CNEL = COMMUNITY NOISE EQUIVALENT LEVEL
WR = WITHIN ROAD RIGHT-OF-WAY

NT + 1293

ROADWAY SEGMENT	SEGID	NOISE LEVELS				
		CNEL AT 50' FROM NEAR TRAVEL LANE CENTERLINE	70 CNEL	65 CNEL	60 CNEL	55 CNEL
UNION ROAD, PRISKA DRIVE TO KIT FOX LANE	1	61.4	WR	WR	69	149
CRESTON ROAD, EAST OF FERRO LANE	2	66.8	WR	74	158	340
CRESTON ROAD, EAST OF GOLDEN HILL ROAD	3	65.5	WR	79	164	350
CRESTON ROAD, SOUTH OF NIBLICK ROAD	4	65.7	WR	81	169	361
CRESTON ROAD, NORTH OF MEADOWLARK ROAD	5	64.8	WR	54	117	251
GOLDEN HILL ROAD, SOUTH OF UNION ROAD	6	67.9	WR	104	221	474
GOLDEN HILL ROAD, NORTH OF UNION ROAD	7	67.3	WR	87	187	402
NIBLICK ROAD, EAST OF SPRING STREET	8	69.8	72	148	314	676
NIBLICK ROAD, EAST OF QUARTERHORSE	9	68.3	59	118	251	538
SHERWOOD ROAD, EAST OF CRESTON ROAD	10	67.1	WR	99	208	447
LINNE ROAD, POPPY LANE TO HANSON ROAD	11	63.8	WR	WR	99	214
PARKVIEW LANE, EAST OF AIRPORT ROAD	12	46.6	WR	WR	WR	WR
SCOTT STREET, EAST OF AIRPORT ROAD	13	50.3	WR	WR	WR	WR
LINNE ROAD, FONTANA TO AIRPORT ROAD	14	53.9	WR	WR	WR	WR
POPPY LANE, SOUTH OF LINNE ROAD	15	40.7	WR	WR	WR	WR
HANSON ROAD, LINNE ROAD TO MEADOWLARK ROAD	16	49.1	WR	WR	WR	WR
MEADOWLARK ROAD, WEST OF HANSON ROAD	17	54.9	WR	WR	WR	55
NIBLICK ROAD, EAST OF FONTANA ROAD	18	64.3	WR	56	119	255
AIRPORT ROAD, NORTH OF NIBLICK ROAD	19	54.6	WR	WR	WR	70
NIBLICK ROAD, AIRPORT ROAD TO LINNE ROAD	20	60.8	WR	WR	69	147
NIBLICK ROAD, SOUTH OF LINNE ROAD	21	56.4	WR	WR	WR	76

CNEL = COMMUNITY NOISE EQUIVALENT LEVEL
WR = WITHIN ROAD RIGHT-OF-WAY

NT + 1293 + SCHOOL

ROADWAY SEGMENT	SEGID	NOISE LEVELS				
		CNEL AT 50' FROM NEAR TRAVEL LANE CENTERLINE	70 CNEL	65 CNEL	60 CNEL	55 CNEL
UNION ROAD, PRISKA DRIVE TO KIT FOX LANE	1	61.4	WR	WR	69	149
CRESTON ROAD, EAST OF FERRO LANE	2	66.8	WR	74	159	341
CRESTON ROAD, EAST OF GOLDEN HILL ROAD	3	65.5	WR	80	165	353
CRESTON ROAD, SOUTH OF NIBLICK ROAD	4	65.7	WR	82	170	362
CRESTON ROAD, NORTH OF MEADOWLARK ROAD	5	64.8	WR	55	117	252
GOLDEN HILL ROAD, SOUTH OF UNION ROAD	6	67.9	WR	104	222	477
GOLDEN HILL ROAD, NORTH OF UNION ROAD	7	67.3	WR	88	188	404
NIBLICK ROAD, EAST OF SPRING STREET	8	69.8	72	148	316	679
NIBLICK ROAD, EAST OF QUARTERHORSE	9	68.3	59	119	253	543
SHERWOOD ROAD, EAST OF CRESTON ROAD	10	67.2	WR	101	213	456
LINNE ROAD, POPPY LANE TO HANSON ROAD	11	63.9	WR	WR	102	218
PARKVIEW LANE, EAST OF AIRPORT ROAD	12	46.8	WR	WR	WR	WR
SCOTT STREET, EAST OF AIRPORT ROAD	13	50.5	WR	WR	WR	WR
LINNE ROAD, FONTANA TO AIRPORT ROAD	14	54.0	WR	WR	WR	WR
POPPY LANE, SOUTH OF LINNE ROAD	15	40.7	WR	WR	WR	WR
HANSON ROAD, LINNE ROAD TO MEADOWLARK ROAD	16	49.4	WR	WR	WR	WR
MEADOWLARK ROAD, WEST OF HANSON ROAD	17	55.2	WR	WR	WR	57
NIBLICK ROAD, EAST OF FONTANA ROAD	18	64.5	WR	58	122	262
AIRPORT ROAD, NORTH OF NIBLICK ROAD	19	54.9	WR	WR	WR	73
NIBLICK ROAD, AIRPORT ROAD TO LINNE ROAD	20	61.0	WR	WR	71	152
NIBLICK ROAD, SOUTH OF LINNE ROAD	21	56.7	WR	WR	WR	80

CNEL = COMMUNITY NOISE EQUIVALENT LEVEL

WR = WITHIN ROAD RIGHT-OF-WAY

CUMULATIVE

ROADWAY SEGMENT	SEGID	NOISE LEVELS				
		CNEL AT 50' FROM NEAR TRAVEL LANE CENTERLINE	70 CNEL	65 CNEL	60 CNEL	55 CNEL
UNION ROAD, PRISKA DRIVE TO KIT FOX LANE	1	63.1	WR	WR	89	192
CRESTON ROAD, EAST OF FERRO LANE	2	67.0	WR	76	164	353
CRESTON ROAD, EAST OF GOLDEN HILL ROAD	3	65.7	WR	82	170	364
CRESTON ROAD, SOUTH OF NIBLICK ROAD	4	65.8	WR	82	171	366
CRESTON ROAD, NORTH OF MEADOWLARK ROAD	5	64.7	WR	53	114	246
GOLDEN HILL ROAD, SOUTH OF UNION ROAD	6	68.5	60	122	258	554
GOLDEN HILL ROAD, NORTH OF UNION ROAD	7	69.3	61	128	273	586
NIBLICK ROAD, EAST OF SPRING STREET	8	69.5	69	141	300	645
NIBLICK ROAD, EAST OF QUARTERHORSE	9	68.3	59	118	251	539
SHERWOOD ROAD, EAST OF CRESTON ROAD	10	66.7	WR	94	198	423
LINNE ROAD, POPPY LANE TO HANSON ROAD	11	62.1	WR	WR	77	166
PARKVIEW LANE, EAST OF AIRPORT ROAD	12	47.1	WR	WR	WR	WR
SCOTT STREET, EAST OF AIRPORT ROAD	13	46.9	WR	WR	WR	WR
LINNE ROAD, FONTANA TO AIRPORT ROAD	14	60.3	WR	WR	58	125
POPPY LANE, SOUTH OF LINNE ROAD	15	40.7	WR	WR	WR	WR
HANSON ROAD, LINNE ROAD TO MEADOWLARK ROAD	16	41.5	WR	WR	WR	WR
MEADOWLARK ROAD, WEST OF HANSON ROAD	17	48.9	WR	WR	WR	WR
NIBLICK ROAD, EAST OF FONTANA ROAD	18	0.0	WR	WR	WR	WR
AIRPORT ROAD, NORTH OF NIBLICK ROAD	19	0.0	WR	WR	WR	WR
NIBLICK ROAD, AIRPORT ROAD TO LINNE ROAD	20	0.0	WR	WR	WR	WR
NIBLICK ROAD, SOUTH OF LINNE ROAD	21	0.0	WR	WR	WR	WR

CNEL = COMMUNITY NOISE EQUIVALENT LEVEL

WR = WITHIN ROAD RIGHT-OF-WAY

CM + 1293

ROADWAY SEGMENT	SEGID	NOISE LEVELS				
		CNEL AT 50' FROM NEAR TRAVEL LANE CENTERLINE	70 CNEL	65 CNEL	60 CNEL	55 CNEL
UNION ROAD, PRISKA DRIVE TO KIT FOX LANE	1	63.3	WR	WR	92	198
CRESTON ROAD, EAST OF FERRO LANE	2	67.2	WR	78	168	362
CRESTON ROAD, EAST OF GOLDEN HILL ROAD	3	66.0	WR	85	178	381
CRESTON ROAD, SOUTH OF NIBLICK ROAD	4	65.9	WR	83	174	371
CRESTON ROAD, NORTH OF MEADOWLARK ROAD	5	64.9	WR	55	118	253
GOLDEN HILL ROAD, SOUTH OF UNION ROAD	6	68.8	63	127	267	578
GOLDEN HILL ROAD, NORTH OF UNION ROAD	7	69.5	63	132	282	605
NIBLICK ROAD, EAST OF SPRING STREET	8	69.8	72	148	316	680
NIBLICK ROAD, EAST OF QUARTERHORSE	9	68.8	63	129	273	586
SHERWOOD ROAD, EAST OF CRESTON ROAD	10	67.9	56	112	237	509
LINNE ROAD, POPPY LANE TO HANSON ROAD	11	64.4	WR	51	109	235
PARKVIEW LANE, EAST OF AIRPORT ROAD	12	48.1	WR	WR	WR	WR
SCOTT STREET, EAST OF AIRPORT ROAD	13	50.5	WR	WR	WR	WR
LINNE ROAD, FONTANA TO AIRPORT ROAD	14	55.4	WR	WR	WR	59
POPPY LANE, SOUTH OF LINNE ROAD	15	40.7	WR	WR	WR	WR
HANSON ROAD, LINNE ROAD TO MEADOWLARK ROAD	16	49.2	WR	WR	WR	WR
MEADOWLARK ROAD, WEST OF HANSON ROAD	17	53.9	WR	WR	WR	WR
NIBLICK ROAD, EAST OF FONTANA ROAD	18	64.7	WR	59	125	269
AIRPORT ROAD, NORTH OF NIBLICK ROAD	19	63.8	WR	63	127	269
NIBLICK ROAD, AIRPORT ROAD TO LINNE ROAD	20	61.2	WR	WR	75	159
NIBLICK ROAD, SOUTH OF LINNE ROAD	21	57.7	WR	WR	WR	93

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CM + 1293 + SCHOOL

ROADWAY SEGMENT	SEGID	NOISE LEVELS				
		CNEL AT 50' FROM NEAR TRAVEL LANE CENTERLINE	70 CNEL	65 CNEL	60 CNEL	55 CNEL
UNION ROAD, PRISKA DRIVE TO KIT FOX LANE	1	63.3	WR	WR	93	199
CRESTON ROAD, EAST OF FERRO LANE	2	67.2	WR	78	168	362
CRESTON ROAD, EAST OF GOLDEN HILL ROAD	3	66.0	WR	86	178	381
CRESTON ROAD, SOUTH OF NIBLICK ROAD	4	65.9	WR	83	174	371
CRESTON ROAD, NORTH OF MEADOWLARK ROAD	5	64.9	WR	55	118	253
GOLDEN HILL ROAD, SOUTH OF UNION ROAD	6	68.8	63	127	269	578
GOLDEN HILL ROAD, NORTH OF UNION ROAD	7	69.5	63	132	282	606
NIBLICK ROAD, EAST OF SPRING STREET	8	69.8	72	149	317	682
NIBLICK ROAD, EAST OF QUARTERHORSE	9	68.9	64	129	275	590
SHERWOOD ROAD, EAST OF CRESTON ROAD	10	68.0	57	114	240	516
LINNE ROAD, POPPY LANE TO HANSON ROAD	11	64.5	WR	52	112	240
PARKVIEW LANE, EAST OF AIRPORT ROAD	12	48.2	WR	WR	WR	WR
SCOTT STREET, EAST OF AIRPORT ROAD	13	50.6	WR	WR	WR	WR
LINNE ROAD, FONTANA TO AIRPORT ROAD	14	55.4	WR	WR	WR	60
POPPY LANE, SOUTH OF LINNE ROAD	15	40.7	WR	WR	WR	WR
HANSON ROAD, LINNE ROAD TO MEADOWLARK ROAD	16	49.5	WR	WR	WR	WR
MEADOWLARK ROAD, WEST OF HANSON ROAD	17	54.1	WR	WR	WR	WR
NIBLICK ROAD, EAST OF FONTANA ROAD	18	64.8	WR	60	128	274
AIRPORT ROAD, NORTH OF NIBLICK ROAD	19	63.9	WR	64	129	274
NIBLICK ROAD, AIRPORT ROAD TO LINNE ROAD	20	61.5	WR	WR	77	164
NIBLICK ROAD, SOUTH OF LINNE ROAD	21	58.0	WR	WR	WR	97

CNEL = COMMUNITY NOISE EQUIVALENT LEVEL
WR = WITHIN ROAD RIGHT-OF-WAY

NOISE PREDICTION MODEL CALIBRATION
MODELED NOISE LEVEL: 60.3
MEASURED NOISE LEVEL: 58.3
DIFFERENCE: 2.0
ACCEPTABLE? YES
CORRECTION FACTORS APPLIED? NO