2045 General Plan Existing Conditions Report

Chapter 8: Noise

Noise Findings

Primary Noise Sources

1. Roadways and freeways are the primary noise sources in the City of Atascadero. Primary transportation noise sources include vehicular traffic along US-101 and SR-41.
2. Freight and Amtrak train traffic along the Union Pacific Railroad corridor result in localized and intermittent noise events.
3. Non-transportation-related noise sources within the City of Atascadero are predominantly associated with industrial and commercial operations and building mechanical equipment. Other noise sources can result in intermittent increases in ambient noise levels, such as short-term construction activities, as well as school and public events.

Opportunities

1. The City's existing General Plan Noise Element includes noise policies and standards to reduce public exposure to transportation and non-transportation (stationary) noise sources. The continued application of these standards, could hinder development of some future land uses, particularly where higher-density residential development is located near major transportation or non-transportation noise sources, such as mixed-use development projects.

8.1 Introduction

This report examines existing noise conditions in the City of Atascadero. The purpose of this report is to provide a context for the General Plan Noise Element by identifying current noise conditions. The information presented in this report will be used by the City to develop noise element policies and objectives and to define programs that will implement those polices.

The intent of this report is to identify and evaluate existing noise problems in the community, and to provide guidance to avoid noise and land use incompatibility problems in the future. The report will address existing noise sources in the community and identifies potential noise impacts. This noise information will serve as the basis for developing guidelines for identifying compatible land uses, identifying the proper distribution of land uses, and establishing proper development standards. A discussion of acoustic fundamentals and terminology is also included.

This chapter is organized into the following sections:

Section 8.1: Introduction
Section 8.2: Regulatory Setting
Section 8.3: Acoustical Fundamentals
Section 8.4: Existing Noise Environment
Section 8.5: Sensitive Land Uses
Section 8.6: Sources
Section 8.7: Acronyms and Key Terms

8.2 Regulatory Setting

Federal, state, and local governments have established noise standards and guidelines to protect citizens from potential hearing damage and various other adverse physiological and social effects associated with noise. Existing regulations most applicable to the City are summarized, as follows:

Federal

U.S. Environmental Protection Agency

In 1974, the U.S. Environmental Protection Agency (EPA) Office of Noise Abatement and Control published a report entitled *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. Although this document does not constitute EPA regulations or standards, it is useful in identifying noise levels at which increased levels of annoyance would be anticipated. Based on an annual-average day-night noise level (expressed as L_{dn} or DNL), the document states that "undue interference with activity and annoyance" will not occur if outdoor noise levels in residential areas are below 55 dBA L_{dn} and indoor levels are below 45 dBA L_{dn} (EPA 1974).

Department of Housing and Urban Development

The Federal Department of Housing and Urban Development (HUD) guidelines for the acceptability of residential land uses are set forth in the Code of Federal Regulations, Title 24, Part 51, "Environmental Criteria and Standards." These guidelines identify an average-daily noise exposure of 65 dBA L_{dn}, or less, as acceptable for residential development. Exterior noise levels of 65 to 75 dBA L_{dn} are considered normally acceptable, provided appropriate sound attenuation is provided to reduce interior noise levels to within acceptable levels. Exterior noise levels above 75 dBA L_{dn} are considered unacceptable. The goal of the interior noise levels for residential, hotel, and hospital/nursing home uses is 45 dBA L_{dn}. These guidelines apply only to new construction supported by HUD grants and are not binding upon local communities (HUD 2021).

Train Horn Rule

Under the federal train horn rule (49 CFR Part 222), locomotive engineers must begin to sound train horns at least 15 seconds, and no more than 20 seconds, in advance of all public grade crossings. In general, depending on train speed, train horns are often sounded within one-quarter mile of a grade crossing. Local communities may reduce the effects of train horns by establishing "quiet zones", which typically incorporate measures to reduce public risk caused by the absence of horn sounding (FRA 2021). No railroad quiet zones were identified in the City.

State

California Building Code

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

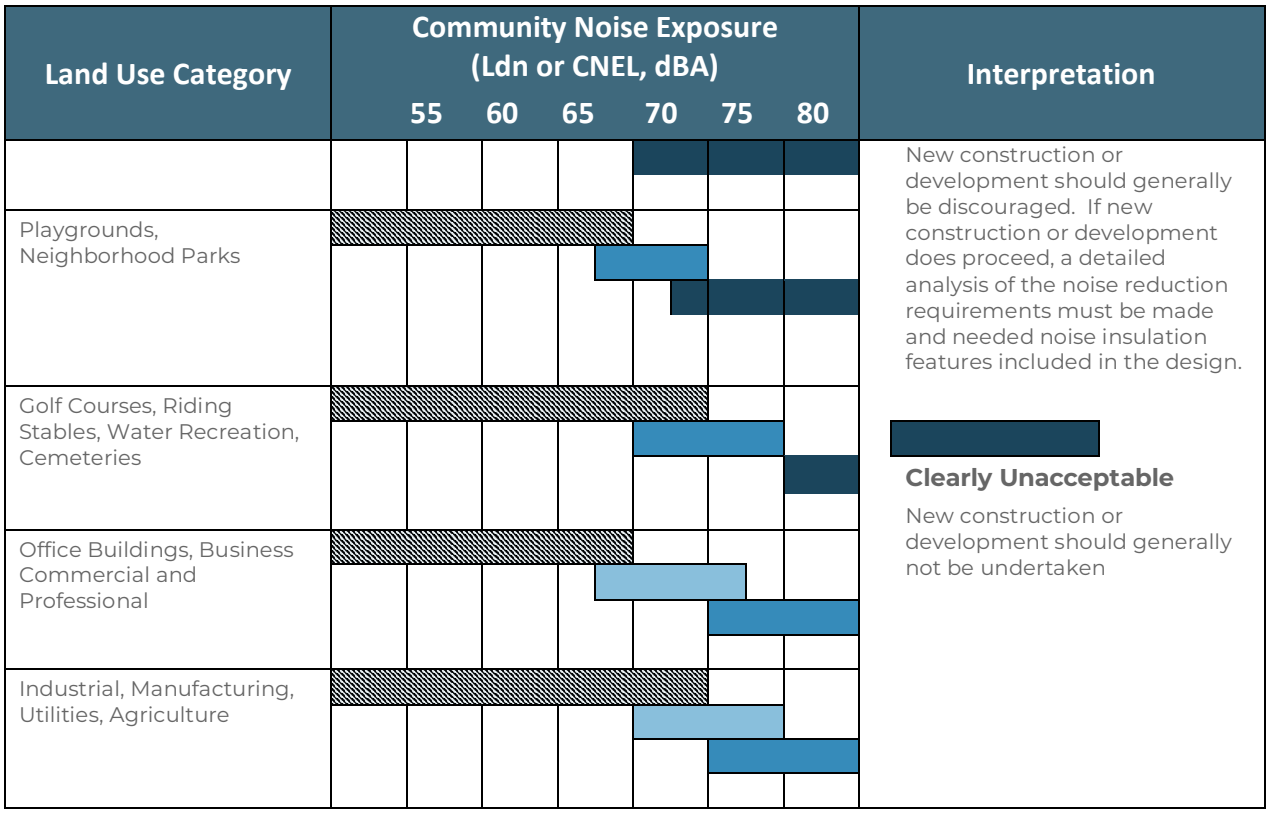
45 dBA CNEL in any habitable room. Proposed multi-family residential structures to be located where the CNEL exceeds 60 dBA shall require an acoustical analysis showing that the proposed building design would achieve the prescribed allowable interior noise standard.

State of California General Plan Guidelines

The *State of California General Plan Guidelines*, published by the Governor's Office of Planning and Research (OPR), provides guidance for the acceptability of new land uses within specific noise environments. The goal of these recommended noise standards is, in part, to allow for a "normally acceptable" interior noise level of 45 dBA CNEL. For instance, assuming an average exterior-to-interior noise reduction of 15 dBA (with windows partially open), an exterior noise level of 60 dBA CNEL for residential land uses, or less, would be sufficient to achieve an interior noise level of 45 dBA CNEL. Higher exterior noise levels may be allowed provided that noise-reduction measures are incorporated to achieve acceptable interior noise levels. Within "conditionally acceptable" exterior noise environments, conventional construction with incorporation of fresh air circulation systems sufficient to allow windows to remain closed would normally suffice. Compliance with current building code requirements and with windows closed, exterior-to-interior noise reductions typically average approximately 25 dBA, or more. The State's guidelines can be modified to reflect communities' sensitivities to noise. The State recommended noise criteria for land use compatibility are summarized in Table 8-1 (State of California 2017).

TABLE 8-1. STATE OF CALIFORNIA LAND USE COMPATIBILITY NOISE CRITERIA

Land Use Category	Community Noise Exposure (Ldn or CNEL, dBA) 55	60	65	70	75	80	Interpretation
Residential – Low Density Single Family, Duplex, Mobile Homes							**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 noise reduction requirements and needed noise insulation features included in the design. **Normally Unacceptable**
Residential – Multiple Family							
Transient Lodging – Motels, Hotels							
Schools, Libraries, Churches, Hospitals, Nursing Homes							
Auditoriums, Concert Halls, Amphitheaters							
Sports Arena, Outdoor Spectator Sports							



Source(s): California OPR 2017

Local

City of Atascadero General Plan 2025

A general plan is a high-level policy document that is often described as the blueprint for development. A general plan establishes the "ground rules" for conserving resources, designing new projects, expanding public services, and improving community amenities. It articulates the community's vision and guides growth, change, and development over a 20-25-year period. Adopted in June 2002, the City of Atascadero General Plan 2025 (General Plan 2025) sets the course of all planning efforts both City-initiated and developer-proposed, and includes four chapters:

- Land Use, Open Space, and Conservation Element
- Circulation Element
- Safety and Noise Element
- Housing Element

The following section lists the Noise Element goals, as they relate to this chapter of the 2045 General Plan Existing Conditions Report.

Noise Element Goals

The Noise Element provides a policy framework for addressing potential noise impacts in the planning process. It identifies exterior average-daily noise standards for the primary purpose of ensuring the compatibility of proposed land uses within exterior noise environments and

ensure that noise levels at adjacent land uses do not exceed acceptable levels. These standards are also designed to protect existing land uses, including transportation and industry, from encroaching on urban uses. These noise standards are largely consistent with those identified in the State of California's General Plan Guidelines, as discussed above, and summarized in Table 8-2 and Table 8-3 (City of Atascadero 2002). The goals of the 2002 Noise Element included:

- **SFN 6:** Protect the citizens of Atascadero from the harmful and annoying effects of exposure to excessive noise.
- **SFN 7:** Protect the economic base of Atascadero by preventing incompatible land uses from encroaching upon existing or planned noise-producing uses.
- **SFN 8:** Preserve the tranquility of residential areas by preventing the encroachment of noise-producing uses.
- **SFN 9:** Educate the residents of Atascadero concerning the effects of exposure to excessive noise and the methods available for minimizing such exposure.
- **SFN 10:** Avoid or reduce noise impacts through site planning and project design, giving second preference to the use of noise barriers and/or structural modifications to buildings containing noise-sensitive land uses.

Noise Element Policies

The following policies have been adopted by the City to accomplish the goals presented in the Noise Element:

- **Policy 1.** The noise standards in this chapter represent maximum acceptable noise levels. New development should minimize noise exposure and noise generation. The City shall maintain a Noise Ordinance that implements the requirements of the Noise Element.

Transportation Noise Sources:

- **Policy 2.** New development of noise-sensitive land uses shall not be permitted in areas exposed to existing or projected future levels of noise from transportation noise sources which exceed 60 dB or CNEL (70 L_d/CNEL for playgrounds and neighborhood parks) unless the project design includes effective mitigation measures to reduce noise in outdoor activity areas and interior spaces to or below the levels specified for the given land use in Table 8-2.
- **Policy 3.** Noise created by new transportation noise sources, including roadway improvement projects, shall be mitigated so as not to exceed the levels specified in Table 8-2 within the outdoor activity areas and interior spaces of existing noise sensitive land uses.

Stationary Noise Sources:

- **Policy 4.** New development of noise-sensitive land uses shall not be permitted where the noise level due to existing stationary noise sources will exceed the noise level standards of Table 8-3 unless effective noise mitigation measures have been incorporated into the design of the development to reduce noise exposure to or below the levels specified in Table 8-3.
- **Policy 5.** Noise created by new proposed stationary noise sources or existing stationary noise sources which undergo modifications that may increase noise levels shall be mitigated so as not to exceed the noise level standards of Table 8-3 on lands designated for noise-sensitive uses. This policy does not apply to noise levels associated with agricultural operations.

Existing and Cumulative Noise Impacts:

- **Policy 6.** The City shall consider implementing mitigation measures where existing noise levels produce significant noise impacts to noise sensitive land uses or where new development may result in cumulative increases of noise upon noise-sensitive land uses.

Table 8-2: Maximum Allowable Noise Exposure — Transportation Noise Sources

Land Use	Outdoor Activity Areas[1]	Interior Spaces	
	(Ldn/CNEL dB)	(Ldn/CNEL dB)	(Leq, dB)2
Residential	60[3]	45	--
Transient Lodging	60[3]	45	--
Hospitals, Nursing Homes	60[3]	45	--
Theaters, Auditoriums, Music Halls	--	--	35
Churches, Meeting Halls, Office Buildings	60[3]	--	45
Schools, Libraries, Museums	--	--	45
Playgrounds, Neighborhood Parks	70	--	--

1. *Where the location of outdoor activity areas is unknown, the exterior noise level standards shall be applied to the property line of the receiving land use.*
2. *As determined for a typical worst-case hour during periods of use.*
3. *Where it is not possible to reduce noise in outdoor activity areas to 60 dB L_{dn}/CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 L_{dn}/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.*

Source(s): City of Atascadero 2002

Table 8-3: Allowable Noise Exposure — Stationary Noise Sources[1]

	Daytime	Nighttime
	(7:00 a.m. to 9:00 p.m.)	(9:00 p.m. to 7:00 a.m.)
Hourly Equivalent (L_{eq} dB)[2]	50	45
Maximum Level (dB)[2]	70	65
Maximum Impulse Level (dB)[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 slow meter response.*
3. *Sound level measurements shall be made with fast meter response.*

Source(s): City of Atascadero 2002

The City's Municipal Code (Title 9, Planning and Zoning, Chapter 14, Noise) includes various provisions intended to protect community residents from prolonged unnecessary, excessive, and annoying sound levels that are detrimental to the public health, welfare, and safety, or are contrary to the public interest. Examples of noise sources subject to the City's municipal Code include, but are not limited to, industrial and commercial machinery and equipment, pumps, fans, compressors, generators, air conditioners, and refrigeration equipment (City of Atascadero 2022).

Noise sources associated with construction-related activities are typically exempt from the City's ordinance provided that the activities do not take place before the hours of seven a.m. or after nine p.m. or by special permit from the Community Development Director. Various other activities are also exempt, including, but not limited to, school entertainment and athletic events, mobile sources associated with agricultural activities, and emergency response activities (City of Atascadero 2022).

In addition, the City's Noise Ordinance sets exterior and interior (Title 9, Sections 9-14.05 and 9-14.06, respectively) noise level standards. The City's exterior and interior noise level standards are summarized in Table 8-4 and Table 8-5, respectively. The exterior noise level standards are applied at the property line of the receiving land use. Where practical, the microphone shall be positioned three to five feet above the ground and away from reflective surfaces. The interior standards applied within the affected dwelling unit, when both the source and receiver are residential land uses. The reported interior noise level shall be determined by taking the arithmetic average of the readings taken at the various microphone locations (City of Atascadero 2022).

Table 8-4: City of Atascadero Municipal Code Exterior Noise Level Standards[1]

	Daytime	Nighttime
	(7:00 a.m. to 9:00 p.m.)	(9:00 p.m. to 7:00 a.m.)
Hourly Equivalent (L_{eq} dB)[2, 3]	50	45
Maximum Level (dB)[2, 3]	70	65

1. *It is unlawful for any person at any location within the incorporated area of the City to create any noise, or to allow the creation of any noise, on property owned, leased, occupied, or otherwise controlled by such person which causes the exterior noise level when measured at any affected single or multiple-family residence, school, hospital, church or public library situated in the City to exceed the noise level standards as set forth in the table.*
2. *In the event the measured ambient noise level exceeds the applicable noise level standard in any category above, the applicable standard shall be adjusted so as to equal the ambient noise level.*
3. *Each of the noise level standards specified above shall be reduced by five (5) dB for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises.*

Source(s): City of Atascadero 2022

Table 8-5: City of Atascadero Municipal Code Interior Noise Level Standards[1]

	Daytime	Nighttime
	(7:00 a.m. to 9:00 p.m.)	(9:00 p.m. to 7:00 a.m.)
Hourly Equivalent (L_{eq} dB)[2, 3]	40	35
Maximum Level (dB)[2, 3]	60	55

1. *It is unlawful for any person at any location within the incorporated area of the City to create any noise, or to allow the creation of any noise, on property owned, leased, occupied, or otherwise controlled by such person which causes the exterior noise level*

	Daytime	Nighttime
	(7:00 a.m. to 9:00 p.m.)	(9:00 p.m. to 7:00 a.m.)
	when measured at any affected single or multiple-family residence, school, hospital, church or public library situated in the City to exceed the noise level standards as set forth in the table.	
	2. *In the event the measured ambient noise level exceeds the applicable noise level standard in any category above, the applicable standard shall be adjusted so as to equal the ambient noise level.*	
	3. *Each of the noise level standards specified above shall be reduced by five (5) dB for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises.*	

Source(s): City of Atascadero 2022

8.3 Acoustic Fundamentals

Introduction

Noise is generally defined as sound that is loud, disagreeable, or unexpected. Sound is mechanical energy transmitted in the form of a wave because of a disturbance or vibration. Sound levels are described in terms of both amplitude and frequency.

Amplitude

Amplitude is defined as 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 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

The frequency of a sound is defined as the number of fluctuations of 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 sound of different frequencies. For instance, the human ear is more sensitive to sound in the higher portion of this range than in the lower and sound waves below 16 Hz or above 20,000 Hz cannot be heard at all. To approximate the sensitivity of the human ear to changes in frequency, environmental sound is usually measured in what is referred to as “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 associated noise levels, in dBA, are depicted in Figure 8-1.

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.

Sound Propagation & Attenuation

Geometric Spreading

Noise sources are generally characterized as either a localized source (i.e., point source) or a line source. Examples of point sources include construction equipment, vehicle horns, alarms, and amplified sound systems. Examples of a line sources include trains and on-road vehicular traffic. Sound from a point source propagates uniformly outward in a spherical pattern.

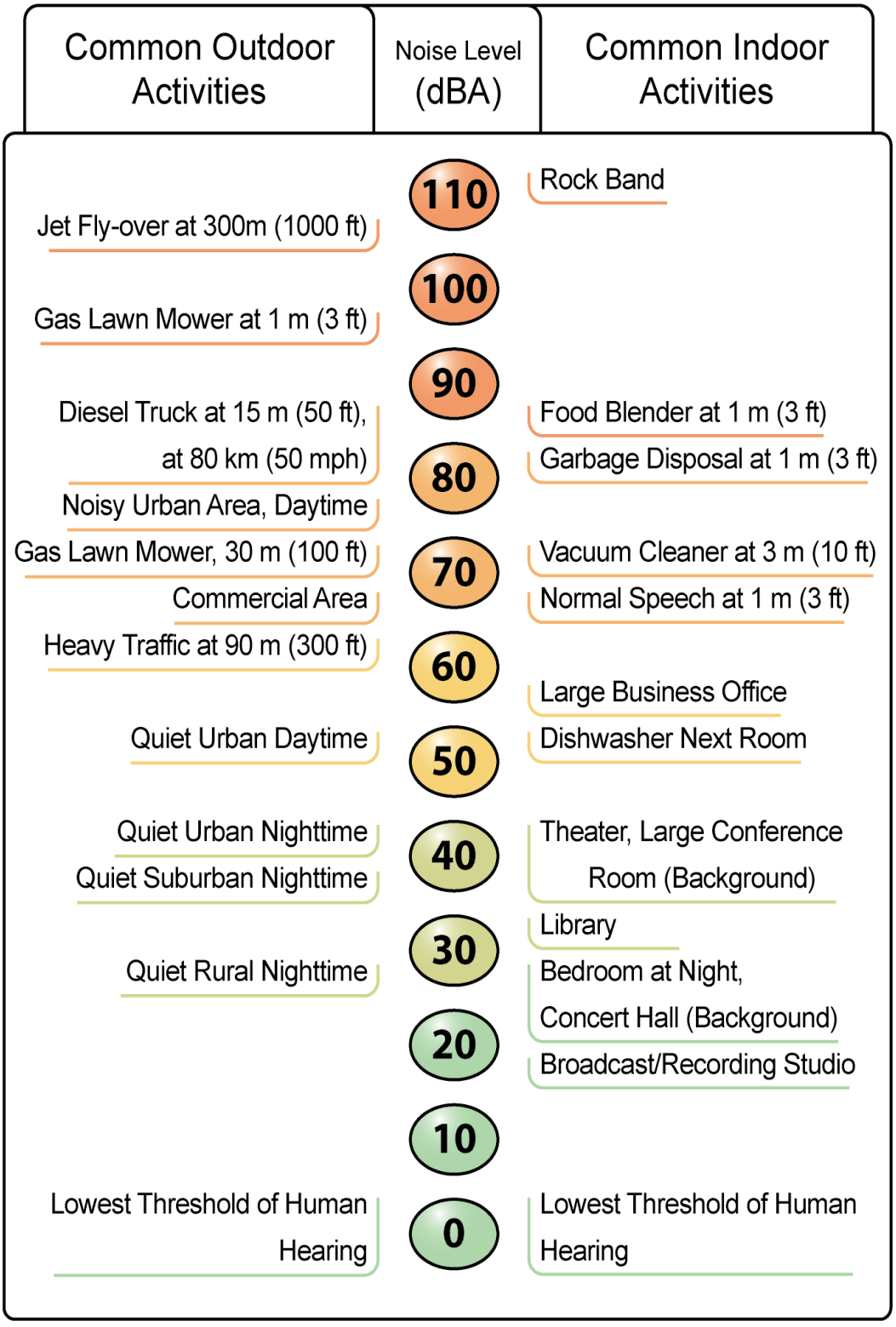
For a point source, sound levels generally decrease (attenuate) at a rate of approximately 6 decibels for each doubling of distance from the source, depending on ground surface characteristics. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver), no excess ground attenuation is assumed. Parking lots and bodies of water are examples of hard surfaces which generally attenuate at this rate. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receiver, such as soft dirt, grass, or scattered bushes and trees), an excess ground-attenuation value of 1.5 decibels per doubling of distance is normally assumed. When soft surfaces are present, the excess ground attenuation for soft surfaces generally results in an overall attenuation rate of approximately 7.5 decibels per doubling of distance from the point source.

On-road vehicle traffic consists 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 for line sources attenuate at a rate of approximately 3 decibels for each doubling of distance for hard sites and approximately 4.5 decibels per doubling of distance for soft sites.

Atmospheric Effects

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

Figure 8-1: Common Noise Levels



Source(s): Caltrans 2021

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 minimum 5 dB of noise reduction. Taller barriers provide increased noise reduction.

Noise reductions afforded by building construction can vary depending on construction materials and techniques. Standard construction practices typically provide approximately 15 dBA exterior-to-interior noise reductions for building facades, with windows open, and approximately 20-25 dBA, with windows closed. With compliance with current building construction and insulation requirements, exterior-to-interior noise reductions typically average approximately 25 dBA. The absorptive characteristics of interior rooms, such as carpeted floors, draperies, and furniture, can result in further reductions in interior noise.

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 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.

8.4 Existing Noise Environment

Monitoring

Short-term (10-minute) and long-term (24-hours) noise level measurements were conducted from October 10, 2022 through October 13, 2022 for the purpose of documenting and measuring the existing noise environment at various locations throughout the City. Measurement locations were selected near major noise sources and other locations of interest within the community.

Short-Term Ambient Noise Measurements

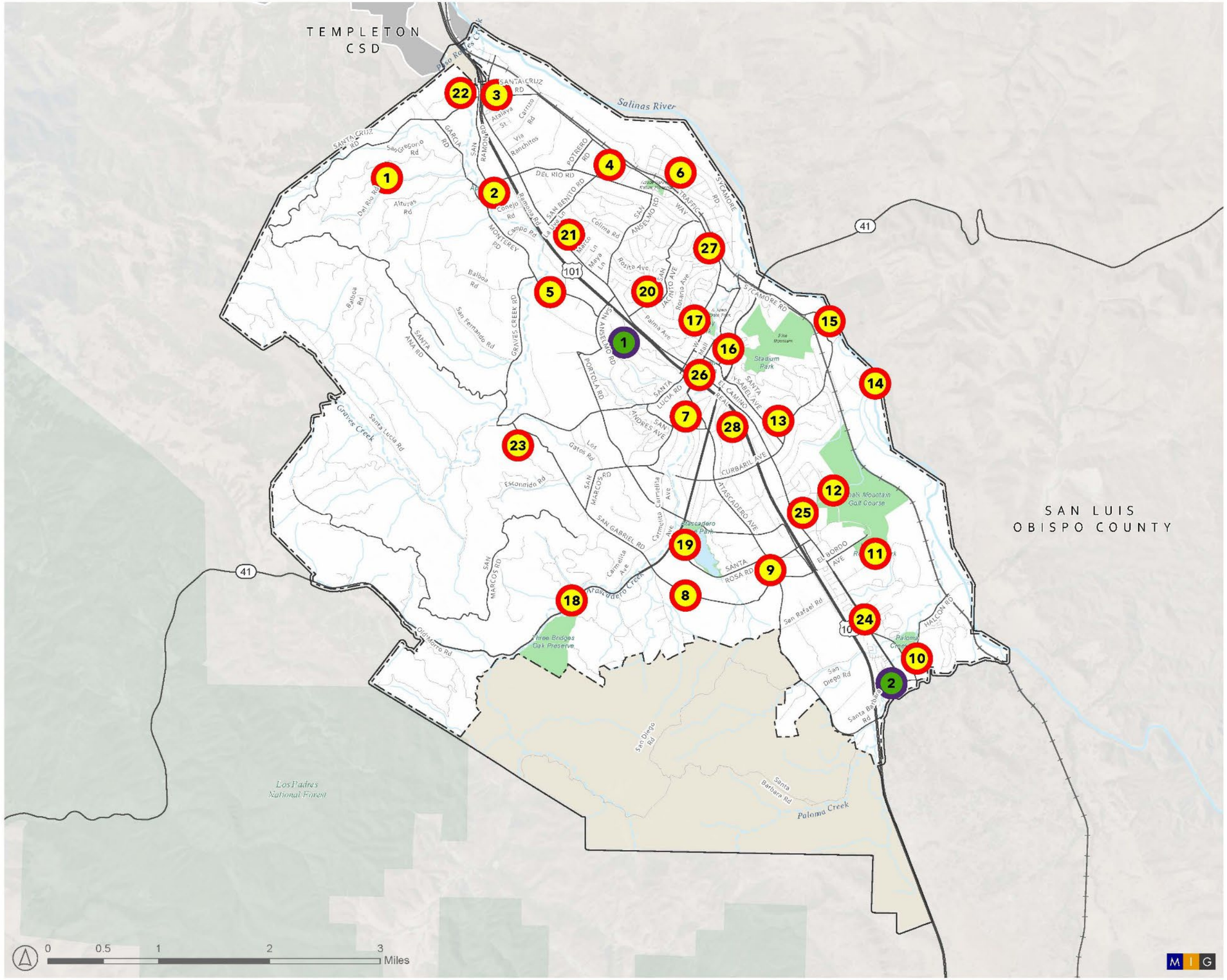
Twenty eight short-term measurement were conducted. Short-term ambient noise measurement locations and corresponding measured average-hourly noise levels (in dBA L_{eq}) are summarized in Table 8-6. Noise measurement locations are depicted in Figure 8-2.

As noted in Table 8-6, measured daytime noise levels ranged from approximately 40 to 73 dBA L_{eq}. Ambient noise levels are largely influenced by vehicle traffic on area roadways. To a lesser extent, aircraft overflights and other noise sources within the community (e.g., landscaping, industrial activities, construction activities) also contribute to the ambient noise environment.

Long-Term Ambient Noise Measurements

Two long-term measurements were conducted, which are identified as LT-1 and LT-2 in Figure 8-2. Noise measurement location LT-1 was located approximately 110 feet from U.S. Highway 101, near San Palo Road. Noise measurement location LT-2 was located approximately 500 feet from U.S Highway 101 and 300 feet from El Camino Real. Measured ambient noise levels for noise measurement locations LT-1 and LT-2 are summarized in Tables 8-7 through 8-8, respectively.

As noted in Tables 8-7, measured ambient noise levels at location LT-1 ranged from approximately 68 dBA L_{eq} during the nighttime hours to a high of approximately 81 dBA L_{eq}, during the daytime hours. Average-daily noise levels at location LT-1 measured 81 dBA CNEL/L_{dn}. Measured ambient noise levels at location LT-2 ranged from approximately 48 dBA L_{eq} during the nighttime hours to a high of approximately 58 dBA L_{eq} during the daytime hours. Average-daily noise levels at location LT-2measured 57 dBA CNEL/L_{dn}. In general, nighttime noise levels are typically 5-10 dB lower than daytime noise levels.



AUTHENTIC Atascadero OUR CITY, OUR PLAN

Figure 8-2
Ambient Noise Measurement Locations

Basemap Features
- Atascadero City Limits
- Atascadero Planning Area
- Rivers + Waterbodies
- Parks + Open Space
- Sphere of Influence
- Major Roads + Freeways

Noise Measurement Locations
- Long-Term (LT) Measurement
- Short-Term (ST) Measurement

Notes and Sources:
Refer to Tables 8-6, 8-7, and 8-8 for corresponding noise measurement data. Ambient Air Quality & Noise Consulting, Esri, US Census, County of San Luis Obispo Open Data, City of Atascadero 2023.

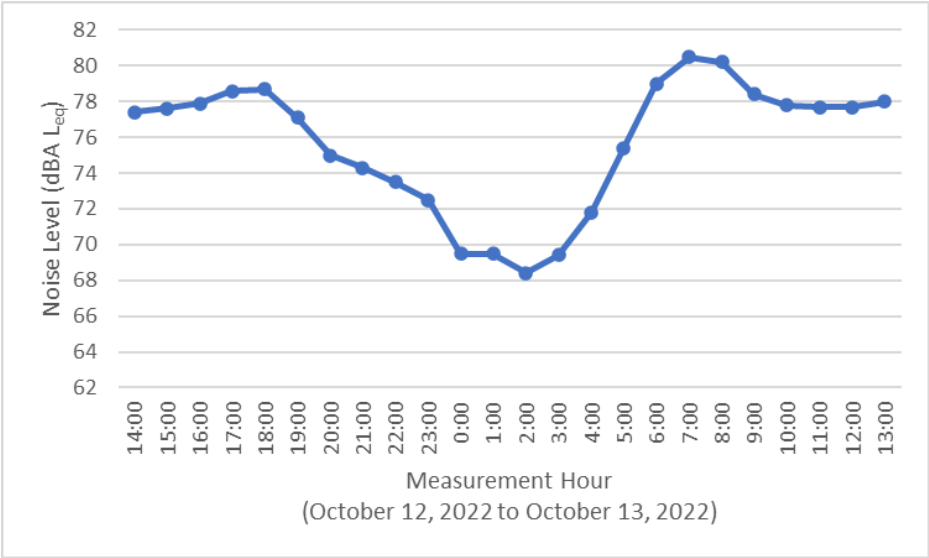
Table 8-6: Summary of Short-Term Measured Ambient Noise Levels

Measurement	Location	Measurement Period	Primary Noise Sources	Noise Level (dBA L_{eq})
October 10, 2022				
ST1	7800 Del Rio Road	10:41 – 10:51	Birds, Electrical Equipment	44.3
ST2	Apple Valley Park	11:03 – 11:13	Birds, Traffic, People Walking on Path	45.3
ST3	5400 Santa Cruz Road	11:50 – 12:00	Distant Traffic, Birds	57.7
ST4	San Benito Elementary School	12:10 – 12:20	Birds, Truck Passby	50.3
ST5	Monterey Road Elementary School	12:32 – 12:42	Traffic, Birds	63.2
ST6	The Lakes Lake	12:57 – 13:07	Birds	41.5
ST7	High School Hill Road	15:08 – 15:18	Traffic, Dogs	52.6
October 11, 2022				
ST8	Hope Lutheran Church	10:02 – 10:12	Traffic, Propeller Plane Overflight, Dogs, Birds	50.7
ST9	9600 Atascadero Avenue	10:26 – 10:36	Traffic, Birds	60.5
ST10	Paloma Creek Park	10:47 – 10:57	Distant Traffic, Children, Birds	44.4
ST11	Heilmann Regional Park	11:10 – 11:20	Traffic, Golf Cart, Birds, Squirrels	40.4
ST12	8500 El Corte Road	11:31 – 11:41	Traffic	52.5
ST13	Pueblo Avenue/ Sombrilla Avenue	11:53 – 12:03	Traffic, Conversation, Propeller Plane Overflight, Dogs	53.5
ST14	7700 Aragon Road	12:16 – 12:26	Dogs, Birds	49.6
ST15	7100 Sycamore Road	12:40 – 12:50	Traffic, Birds, Children, Sheep/Goat	64.7

Measurement	Location	Measurement Period	Primary Noise Sources	Noise Level (dBA L_{eq})
ST16	5454 CA-41 Parking	13:03 – 13:13	Traffic	64.8
ST17	Traffic Way Park	13:24 – 13:34	Traffic	57.8
October 12, 2022				
ST18	12500 CA-41	10:51 – 11:01	Traffic	67.9
ST19	Atascadero Lake Park	11:25 – 11:35	Traffic	63.9
ST20	Nogales Avenue/ Lobos Avenue	11:56 – 12:06	Traffic, Birds, Dog, Distant Power Tool	53.4
ST21	3300 El Camino Real	12:19 – 12:29	Traffic	68.2
ST22	1000 San Ramon Road	13:24 – 13:34	Traffic	71.2
ST23	6000 San Gabriel Road	14:06 – 14:16	Traffic, Propeller Plane Overflight	56.8
October 13, 2022				
ST24	10700 El Camino Real	10:40 – 10:50	Traffic	66.9
ST25	8965 El Camino Real	11:00 – 11:10	Traffic	71.7
ST26	Sunken Gardens	11:22 – 11:32	Traffic, Water Fountain	58.3
ST27	4890 Alamo Avenue	11:45 – 11:55	Dogs, Vehicle Passby	56.0
ST28	6050 Marchant Avenue	12:56 – 13:06	Traffic	73.1

Notes: Noise measurements were conducted from October10, 2022 through October 13, 2022. Refer to Figure 8-2 for noise measurement locations.

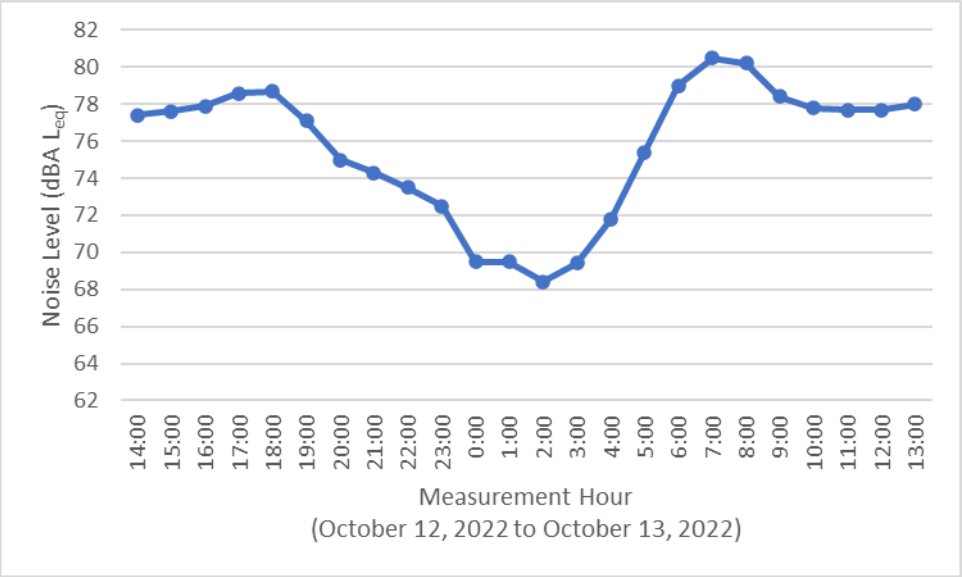
Table 8-7: Measured Long-Term Noise Levels – Measurement Location LT-1



Measurement Hour	Noise Level (dBA L_{eq})
14:00	77.4
15:00	77.6
16:00	77.9
17:00	78.6
18:00	78.7
19:00	77.1
20:00	75
21:00	74.3
22:00	73.5
23:00	72.5
0:00	69.5
1:00	69.5
2:00	68.4
3:00	69.4
4:00	71.8
5:00	75.4
6:00	79
7:00	80.5
8:00	80.2
9:00	78.4
10:00	77.8

Measurement Hour	Noise Level (dBA L_{eq})
11:00	77.7
12:00	77.7
13:00	78
Notes: Average-daily noise level measured 81 dBA CNEL/Ldn. Refer to Figure 8-2 for noise measurement location.	

Table 8-8: Measured Long-Term Noise Levels – Measurement Location LT-2



Measurement Hour	Noise Level (dBA L_{eq})
15:00	55.7
16:00	57.5
17:00	54.9
18:00	53.3
19:00	53.8
20:00	52
21:00	51.2
22:00	50.3
23:00	49.7
0:00	48.1
1:00	48.6
2:00	47.5
3:00	47.7
4:00	49.3

Measurement Hour	Noise Level (dBA L_{eq})
5:00	49.3
6:00	53.9
7:00	53.5
8:00	52.7
9:00	52.4
10:00	54.5
11:00	55.8
12:00	53.4
13:00	52
14:00	52.3
Notes: Average-daily noise level measured 57 dBA CNEL/L_{dn}. Refer to Figure 8-2 for noise measurement location.	

Noise Sources

Surface Transportation Sources

Roadway Vehicular Traffic

As noted earlier in this report, noise from vehicular traffic on area roadways is a primary source of ambient noise in the City. Major sources of roadway traffic noise within the City of Atascadero include United States Highway 101 (US-101), State Route 41 (SR-41). To a lesser extent, El Camino Real and Traffic Way contribute to roadway traffic noise.

Traffic noise levels were calculated using the Federal Highway Administration (FHWA) Roadway Noise Prediction Model (FHWA RD-77-108) based on average-daily traffic (ADT) volumes obtained from the Caltrans Traffic Census Program (Caltrans 2022). Predicted existing traffic noise levels and distances to traffic noise contours for major roadways are summarized in Table 8-9. Based on the modeling conducted, existing traffic noise levels along area roadways range from approximately 67 to 79 dBA CNEL at 50 feet from the near-travel-lane centerline. The primary generator of traffic noise within the City of Atascadero is US-101. Existing average-daily noise levels at 50 feet from the near-travel-lane centerline of US-101 are approximately 79 dBA CNEL. Existing transportation noise contours within the City of Atascadero are depicted in Figure 8-3.

Table 8-9. Existing Roadway Traffic Noise Levels & Contour Distances

Roadway Segment	ADT Volumes	CNEL at 50 ft. from Near-travel-lane Centerline	Distance to CNEL Contour (Feet from Road Centerline)		
			70	65	60
US-101: Santa Barbara Rd to Santa Rosa Rd	55,000	78.7	313	669.8	1,440.6
US-101: Santa Rosa Rd to Curbaril Ave	55,000	78.7	313	669.8	1,440.6
US-101: Curbaril Ave to SR-41	55,000	78.7	313	669.8	1,440.6
US-101: SR-41 to Traffic Way	63,000	77.5	260.9	556.5	1,196.1
US-101: Traffic Way to San Anselmo Rd	63,000	77.5	260.9	556.5	1,196.1
US-101: San Anselmo Rd to del Rio Rd	63,000	77.5	260.9	556.5	1,196.1
US-101: Del Rio Rd to San Ramon Rd	65,000	77.6	266.2	568.1	1,221.3
US-101: San Ramon Rd to Vineyard Rd	65,000	77.6	261.6	558.1	1,221.3
SR-41: Cerro Alto Rd to Santa Rosa Rd	10,000	70.4	59.8	128.4	276.3
SR-41: Santa Rosa Rd to US-101	12,000	66.6	WR	75.1	160.9
SR-41: US-101 to El Camino Real	12,000	70.2	82.2	167.5	356.2
SR-41: El Camino Real to CA-229	12,000	75.7	134.3	289.0	622.4

Notes: Traffic volumes for US-101 and SR-41 were derived from Caltrans Traffic Census Program for year 2020. Does not include shielding from intervening structures or terrain.

Source(s): Caltrans 2022

As noted in Table 8-9 and depicted in Figure 8-3, major roadway corridors located within the City include US-101 and SR-41. Existing noise-sensitive land uses located along these traffic corridors consist predominantly of residential land uses the nearest of which are generally located approximately 50 feet from the near-travel-lane centerline of US-101 and approximately 27 feet from the near-travel-lane centerline of SR-41. Other noise-sensitive land uses generally located along these corridors include, but are not limited to, places of worship, hotels, and recreational uses.

Railroad Traffic

The Union Pacific Railroad (UPRR) runs north-south through the City near the western City limits with a portion of the tracks adjacent to Traffic Way. Depending on demand, approximately five trains pass through the City on a daily basis. including three freight trains and two passenger trains (Amtrak Coast Starlight).

Existing train noise levels and distance to noise contours are summarized in Table 8-10. Based on a conservative estimate of 5 trains per day, average-daily noise levels along the railroad corridor would be approximately 66 dBA CNEL at 100 feet from the rail corridor centerline. Train noise events can also be a source of intermittent noise, including noise generated by locomotive engines, wheel squeal, and warning horns. These instantaneous noise events can contribute to increased levels of annoyance to occupants of nearby noise-sensitive land uses. Existing transportation noise contours within the City of Atascadero are depicted in Figure 8-3.

Table 8-10. Existing Railroad Traffic Noise Levels

Train Type	Number of Trains/Day	CNEL at 100 feet from Railroad Track Centerline	Distance to CNEL Contours (feet) from Railroad Track Centerline		
			70	65	60
Freight & Passenger	5	66	51	108	233

Notes: UPRR freight trains distributed equally over a 24-hour period. Does not include shielding provided by intervening terrain or structures. Does not include shielding from intervening structures or terrain. Projected railroad noise contours are depicted in Figure 8-3.

Existing noise-sensitive land uses located along the UPRR corridor consist predominantly of residential land uses the nearest of which are generally located approximately 25 feet from the UPRR track centerline. Other nearby noise-sensitive land uses include Chalk Mountain Golf Course, which is located approximately 70 feet from the track centerline.

Non-Transportation Sources

Within the City, major non-transportation noise sources consist predominantly of industrial and commercial land uses. Many industrial processes produce noise, even when the best available noise control technology is applied. Noise exposures within industrial facilities are controlled by federal and state employee health and safety regulations (i.e., regulations of the Occupational Safety and Health Administration of the U.S. Department of Labor [OSHA] and the California Division of Occupational Safety and Health [Cal-OSHA]). Exterior noise levels that affect neighboring parcels are typically subject to local standards. Commercial, recreational, and public facility activities can also produce noise that may affect adjacent noise-sensitive land uses. These noise sources can be continuous or intermittent and may contain tonal components that are annoying to individuals who live nearby. For instance, emergency-use sirens and backup alarms are often considered nuisance noise sources but may not occur frequently enough to be considered incompatible with noise-sensitive land uses. In addition, noise generation from fixed noise sources may vary based upon climate conditions, time of day, and existing ambient noise levels.

From a land-use planning perspective, stationary-source noise control issues focus on two goals: (1) preventing the introduction of new noise-producing uses in noise-sensitive areas; and (2) preventing encroachment of noise-sensitive uses upon existing noise-producing facilities. The first goal can be achieved by applying noise performance standards to proposed new noise producing uses. The second goal can be met by requiring that new noise-sensitive uses near noise-producing facilities include noise-reduction measures to

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Figure 8-3
Transcription Noise Contours

Basemap Features

- Atascadero City Limits
- Atascadero Planning Area
- Rivers + Waterbodies
- Parks + Open Space
- Sphere of Influence
- Major Roads + Freeways

Existing Noise Contours

CNEL in dB(A)

- > 70
- 65 - 70

0 0.5 1 2 3 Miles

Notes and Sources:
Predicted noise contours do not include shielding from intervening structures or terrain. Ambient Air Quality & Noise Consulting, Esri, US Census, County of San Luis Obispo Open Data, City of Atascadero 2023.

ensure compliance with noise performance standards. Each of these goals stresses the importance of avoiding the location of new uses that may be incompatible with adjoining uses.

The following discussions of existing non-transportation noise sources in the community are intended to be representative of the sources and relative noise levels associated with such uses. The average-hourly noise levels (in dBA L_{eq}) discussed for these sources provide an indication of the noise levels that can generally be expected to occur over an extended period of time. The L_{eq} noise levels do not necessarily reflect possible intermittent high noise levels associated with the various uses but are useful for general planning purposes. Actual noise levels at nearby noise-sensitive receptors will vary depending on the operational characteristics of the facility, meteorological conditions, and the physical landscape.

Non-transportation noise sources within the City consist predominantly of commercial and industrial uses. To a somewhat lesser extent, other non-transportation noise sources would also include automotive/equipment repair and maintenance facilities, and construction activities. Noise levels associated with some of the more common non-transportation noise sources located throughout the community are discussed in more detail, as follows:

Commercial and Industrial Uses

Within the City planning area, commercial and industrial land uses are located primarily along major roadway and the UPRR corridor. Noise sources commonly associated with these land uses include truck traffic, loading dock activities, heavy-equipment operation, and building mechanical systems. Major industrial and commercial operations within the community include metal and glass recycling centers, trucking distribution centers, and food and agricultural products processing. Various other activities, such as loading dock activities, can result in temporary or intermittent increases in ambient noise levels. In general, noise levels associated with these uses can range from approximately 55 to 85 dBA L_{eq} at 50 feet.

Noise levels associated with commercial and industrial land uses can vary depending on various factors, including site conditions, equipment operated, and the specific activities being conducted. As a result, actual noise levels at nearby noise-sensitive receptors will likely vary depending on the above mentioned conditions and other influences, such as location, distance from source, shielding provided by intervening terrain and structures, and ground attenuation rates. For this reason, noise generated by commercial and industrial uses and impacts to nearby noise-sensitive land uses should be evaluated on a project-by-project and site-specific basis.

Other Non-Transportation Noise Sources

Various other non-transportation noise sources can contribute to noticeable increases in ambient noise levels. Such sources would include, but are not limited to, recreational uses or events, particularly those that utilize amplified sound systems (e.g., sporting events, concerts, festivals, public actions, animal/vehicle exhibitions, etc.); automotive repair facilities; building mechanical systems, and landscape maintenance activities. Noise generated by such sources are often directional and can vary depending on site and operational characteristics.

Concerts and Live Music

Outdoor live music, festivals, and concert events are hosted at several locations within the City; such as, the Atascadero Lake Park, the Sunken Gardens, and The Plaza. Noise levels associated with live music and concerts can vary depending on musical style (e.g., rock, pop,

metal, hip-hop, classical, etc.) and amplification. Additionally, noise generated from amplification (speakers) is directional, which can greatly affect operational noise levels at offsite locations.

Landscape Maintenance

Landscape maintenance activities often result in sporadic and intermittent increases in ambient noise levels. Equipment used for landscape maintenance often include the use of power mowers and leaf blowers. Leaf blowers and gasoline-powered lawnmowers can result in intermittent noise levels of up to approximately 100 dBA at 3 feet (EPA 1971). Resultant exterior noise levels could reach intermittent levels of approximately 75 dBA L_{max} at 50 feet. The use of leaf blowers, particularly when used during the more noise-sensitive evening and nighttime hours, may result in increased levels of annoyance.

Automotive Maintenance & Repair

Typical automotive maintenance and repair activities often include the use of pneumatic tools, air compressors, and power generators. Other equipment operations such as the use of power hand tools (e.g., sanders, drills, grinders, pneumatic wrenches, etc.), typically generate a lesser degree of noise. The use of air compressors, power generators, and pneumatic tools can generate noise levels of up to approximately 85 dBA at 50 feet. Noise levels generated by the use of hand-held tools, such as sanders, drills, and grinders, typically average between 63 and 87 dBA at 3 feet. The use of multiple hand tools, such as grinders being used on metal, can generate levels of 87 to 97 dBA at 3 feet (EPA 1971, FHWA 2008). Noise levels associated with these facilities would be dependent on the specific activities performed and source/facility characteristics.

Building Mechanical Systems

The majority of electrical and mechanical equipment in buildings is used for air circulation systems. Mechanical systems may also include pumping systems, elevators and escalators, and various other material conveyance systems. Much of this equipment is located in mechanical equipment rooms or in areas that provide shielding from direct public/personnel exposure (i.e., above ceilings, in walls, or behind enclosures.) Equipment located within exterior areas can result in increases in ambient noise levels, particularly when located in unshielded areas and within line-of-sight of nearby receptors. Such equipment would include air-conditioning units, cooling towers, compressors, fans/turbines, electrical transformers, chillers, and pumps. Noise levels associated with these sources can vary depending on the specific equipment being operated, facility/equipment design, and operational characteristics. Typical noise levels associated with building mechanical equipment can range from less than 50 to 110 dBA at 3 feet, with the highest noise levels reaching approximately 85 dBA at 50 feet from the source.

Construction Activities

Construction noise typically occurs intermittently and varies depending upon the nature or phase (e.g., demolition/land clearing, grading, and excavation, erection) of construction. Noise generated by construction equipment, including pile drivers, material handling equipment, pavers, jackhammers, and portable generators, can result in intermittent and prolonged increases in ambient noise levels. Although construction noise impacts are generally short-term, they can result in increased levels of annoyance to occupants of nearby

residential dwellings. In general, noise levels generated by construction activities can range from approximately 71 to 83 dBA L_{eq} at 50 feet from the source.

Noise-generating construction activities are currently regulated through implementation of the City's Noise Control ordinance, which generally limits these activities to the less noise-sensitive daytime hours (City of Atascadero 2022).

8.5 Sensitive Land Uses

Noise-Sensitive Land Uses

Noise-sensitive land uses are generally considered to include those uses that would result in noise exposure that could cause health-related risks to individuals. Places where quiet is essential are also considered noise-sensitive uses. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Other land uses such as parks, historic sites, cemeteries, and recreation areas are also considered potentially sensitive to increases in exterior noise levels. School classrooms, places of assembly, hotels, libraries, and other places where low interior noise levels are essential are also considered noise-sensitive land uses.

The following noise-sensitive land uses have been identified within the City of Atascadero:

Residential land uses, including single-family units and multi-family units
Schools
Atascadero State Hospital
Assisted living/care facilities
Places of worship
Hotels and lodging
Community parks
Public Library

8.6 Sources

Reports and Documents

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8.7 Acronyms and Key Terms

ADT: Average-Daily Traffic

Caltrans: California Department of Transportation

CNEL: Community Noise Equivalent Level

dB: Decibels

dBA: A weighted decibels

EPA: U.S. Environmental Protection Agency

FHWA: Federal Highway Administration

HUD: Federal Department of Housing and Urban Development

Hz: Hertz

Ldn: Annual-Average Day-Night Noise Level

Leq: Equivalent Sound Level

OPR: Governor's Office of Planning and Research

OSHA: Occupational Safety and Health Administration

UPRR: Union Pacific Railroad