CITY OF PISMO BEACH

NOISE ELEMENT UPDATE

March 2022



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Noise Element

1. Introduction and Purpose

This Element identifies the City's approach to controlling environmental noise and limiting community exposure to excessive noise levels. The fundamental goals of a Noise Element are to:

1. Identify and analyze the major noise sources in the community.
2. Provide data and guidance to inform a pattern of land uses that minimizes exposure of community residents to excessive noise.
3. Protect quiet areas of a community from noise.
4. Develop implementation measures and strategies to address existing and foreseeable noise problems.[1]

1.1 Relationship to State Law

State law (California Government Code Section 65302(f)) requires general plans to include a Noise Element that identifies and evaluates noise problems in the City. The Noise Element shall recognize the guidelines established by the State Department of Public Health to analyze and quantify, to the extent practicable, as determined by the jurisdiction's legislative body, current and projected noise levels for all of the following sources:

- Highways and freeways
- Primary arterial and major local streets
- Passenger and freight online railroad operations and ground rapid transit systems
- Commercial, general aviation, heliport, helistop, and military airport operations, aircraft overflights, jet engine test stands, and all other ground facilities and maintenance functions related to airport operation
- Local industrial plants, including, but not limited to, railroad classification yards
- Other ground stationary noise sources identified by local agencies as contributing to the community noise environment.

1.2 Relationship to Other General Plan Elements

The Noise Element is correlated with the Land Use, Circulation, and Housing Elements. Noise can have a significant impact on land use, and policies in the Noise Element are designed to ensure protection from noise for sensitive uses, as further discussed in the Land Use Element. Future noise levels may be affected by the construction of new land uses that generate noise. To respond to the noise sensitivity of certain land uses, the Noise Element includes policies to reduce noise impacts on noise-sensitive uses. Future noise contour information is based on traffic volumes, speeds, and railroad operations as described in the Circulation Element. The Noise Element relates to the Housing Element by promoting desirable residential environments that are buffered from undesirable noise impacts.

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[1] OPR (Governor's Office of Planning and Research). 2017. *State of California General Plan Guidelines: 2017 Update*. Accessed April 2019. http://opr.ca.gov/planning/general-plan/guidelines.html.

1.3 Relationship to Community Vision

Consistent with the Community Vision described in the introductory chapter, the City has developed a guiding principle to set the framework for this Noise Element. The Noise Element strives to implement the community vision through its goals, policies, and actions, and is built around the following guiding principle:

Noise Levels and Compatibility
The City will take actions to ensure that residents and workers in the City and visitors to the City will not be subjected to excessive levels of noise. Further, the City will protect long term values of both public and private investment by preventing the deterioration of the properties as a result of incompatible noise intrusion.

1.4 Understanding Noise

Noise is commonly understood as annoying or unwanted sound. Sound can be described by scientists and engineers in two characteristics, amplitude and pitch. Amplitude is driven by the energy content in sound waves and results in the loudness of sounds, which are described as "sound pressure level" or simply "sound level." Amplitude is measured in decibels (dB), which use a logarithmic scale. Pitch is the frequency of sound waves and results in how "high" or "low" a sound is. Pitch is measured in hertz (Hz). The most common weighting that is used in noise measurements is an A-weighted decibel (dBA), which is a composite representation of sounds at pitches that can be heard by the human ear.

Since sound is measured on a logarithmic scale, a doubling of sound energy results in a 3 dBA increase in the noise level. Changes in a community noise level of less than 3 dBA are not typically noticed by the human ear. Changes from 3 to 5 dBA may be noticed by some individuals who are extremely sensitive to changes in noise. A 5 dBA increase is readily noticeable.[2] The human ear perceives a 10 dBA increase in sound level as a doubling of the sound level (e.g., 65 dBA sounds twice as loud as 55 dBA to a human ear).

Community noise is generated by many distant sources that change throughout the day. Two metrics are commonly used to describe average noise levels in a community: Day/Night Noise Level (L_{dn}) and Community Noise Equivalent Level (CNEL). L_{dn} and CNEL are 24-hour averages that add a penalty to night time noises, because communities are most sensitive to noise at night. CNEL, unlike L_{dn}, also penalizes evening noises. See Table N-1 for a list of acoustical terms and their corresponding definitions.

Table N-1
Definitions of Acoustical Terminology

Term	Definition
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.

[2] EPA (U.S. Environmental Protection Agency). 1973. *Public Health and Welfare Criteria for Noise*. July 27, 1973.

Table N-1
Definitions of Acoustical Terminology

Term	Definition
A-Weighted Sound Level (dBA)	Decibels A-weighted, referring to decibels weighted to the "A scale." Decibels A-weighted represent the sound level containing a range of frequencies weighted in a manner representative of the ear's response.
Community Noise Equivalent Level (CNEL)	The average A-weighted sound level during a 24-hour day, obtained after addition of 5 decibels to the average hourly sound levels in the evening from 7:00 p.m. to 10:00 p.m. and after addition of 10 decibels to the average hourly sound levels during the night between 10:00 p.m. and 7:00 a.m.
Day/Night Noise Level (L_{dn})	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to the hourly average noise levels measured during the night between 10:00 p.m. and 7:00 a.m.
Decibel (dB)	A unit of measurement (dB) on a logarithmic scale that describes the magnitude of a particular quantity of sound pressure or power with respect to a standard reference sound pressure of 20 µPascals.
Equivalent Sound Level (L_{eq})	Energy equivalent level, which is the equivalent steady-state sound level that, in a stated period of time, contains the same acoustical energy as a time-varying sound during the same time period. An L_{eq} level is computed by summing the noise energy over the stated time period using mathematical integration. It is commonly also referred to as the "average sound level."
Frequency (Hz)	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz.
L_{max}, L_{min}	The maximum and minimum A-weighted sound level during the measurement period.
Noise	Unwanted sound.
Noise Contour	A line on a map that represents equal levels of noise exposure, and also the boundary or limit for sound exposure of that level. Noise contours are generally provided in 5 dBA CNEL increments, which means the area between a 60 dBA CNEL contour and a 65 dBA CNEL contour has noise exposure ranging between 60 and 65 dBA CNEL.
Noise Impacted Areas	Areas with existing or projected exterior noise levels exceeding either 60 dB L_{dn}/CNEL.
Noise-Sensitive Land Uses	Any property where frequent exterior human use occurs and where a lowered noise level would be beneficial. In the City of Pismo Beach these are land uses that are designated for residential, recreation, religious worship, schools, libraries, and short-term lodging.
Noise-Generating Land Uses	Any property where noise may be generated and at such a level that noise beyond its property boundary could exceed established CNEL levels.

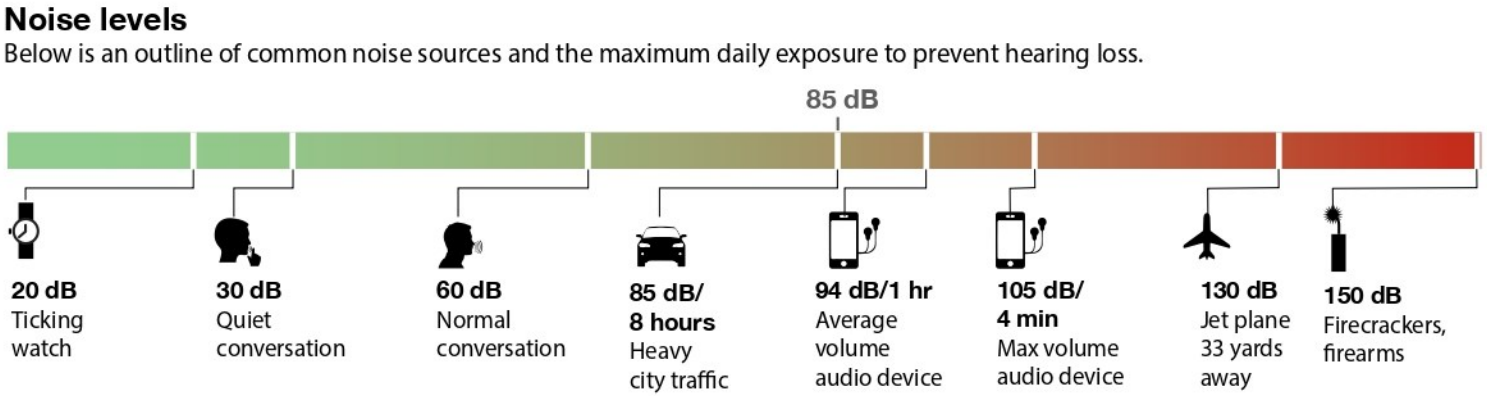
Table N-1
Definitions of Acoustical Terminology

Term	Definition
Yard Area	A 50 foot radius around a residential structure when the lot size exceeds the boundary of such radius

Noise levels that occur over short periods of time, such as construction or concerts, are not well regulated by CNEL. For these temporary events, an Equivalent Continuous Sound Level (L_{eq}) is established to address appropriate noise limits for avoidance of noise nuisance for nearby noise-sensitive land uses. An L_{eq} measures the average sound pressure over the duration of the event and is appropriate for application to noise sources that are scheduled, temporary, and louder than the community noise standards allow. In addition to L_{eq}, the maximum instantaneous sound level (L_{max}) can be employed in order to prevent excessive sound levels that could be particularly disruptive, or even harmful.

Figure N-1 outlines common noise sources and their noise levels.

Figure N-1, Common Noise Sources



Sources: Humboldt County. 2017. "Noise Element." In *Humboldt County General Plan*. Adopted October 23, 2017. Accessed May 2019. https://humboldtgov.org/205/General-Plan.

WHO (World Health Organization). 2015. *Hearing Loss due to Recreational Exposure to Loud Sounds: A Review*. Accessed May 2019. https://apps.who.int/iris/bitstream/handle/10665/154589/9789241508513_eng.pdf;jsessionid=2420F38BD389D11BCE037D718CA78D02?sequenc

2. Existing Conditions

2.1 Noise in Pismo Beach

Pismo Beach is home to noise-sensitive land uses such as residences, churches, schools, and hotels. The City is also home to noise-generating uses such as highways, train tracks, and limited industrial uses. Noise sensitive land uses and principal noise sources are described below and shown in Figure N-2. The purpose of the Noise Element is to identify and define existing and future noise levels, guide land use decisions concerning the location of common sources of excess noise, and establish performance goals, policies, and actions for the range of proposed land uses present within the City. Long range control of noise is enacted through proper zoning, regulations and the project review process to separate incompatible uses and guide site design, building orientation and construction to ensure the compatibility of a project with the noise environment of the City.

Noise varies widely in its scope, source, and volume, ranging from individual occurrences such as a barking dog, to the intermittent disturbances of trains or overhead aircraft, to the fairly constant noise generated by traffic on Highway 101. Noise can affect all aspects of daily life and acceptable noise thresholds are established and controlled based on the various types of uses and their sensitivity to noise. Balancing the needs of quiet places in Pismo Beach while supporting the growth and development of industry and allowing the flow of tourism to continue is a primary goal of this Noise Element.

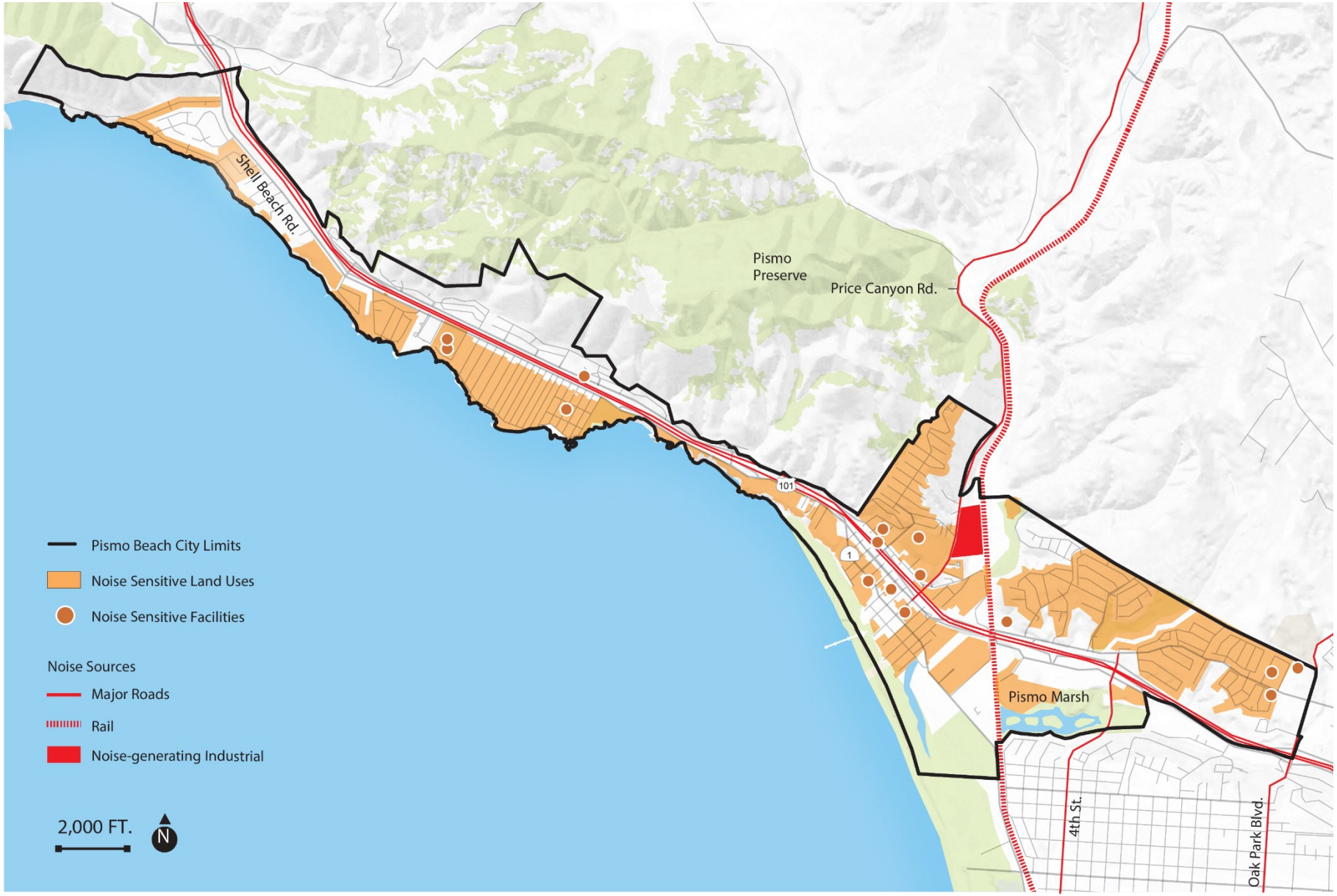
2.2 Noise-Sensitive Land Uses

Noise-sensitive land uses are generally defined as locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Places where people live, sleep, recreate, worship, and study generally are considered to be sensitive to noise because intrusive noise can be disruptive to these activities. When community noise interferes with human activities or contributes to stress, public annoyance with the noise sources increases, and the acceptability of the environment for people decreases.

Sensitive land uses include the following:

- Residential uses
- Visitor lodging – hotels, motels, inns
- Schools
- Libraries
- Places of religious worship
- Hospitals
- Assisted living facilities
- Public parks

Figure N-2, Noise Sensitive Land Uses

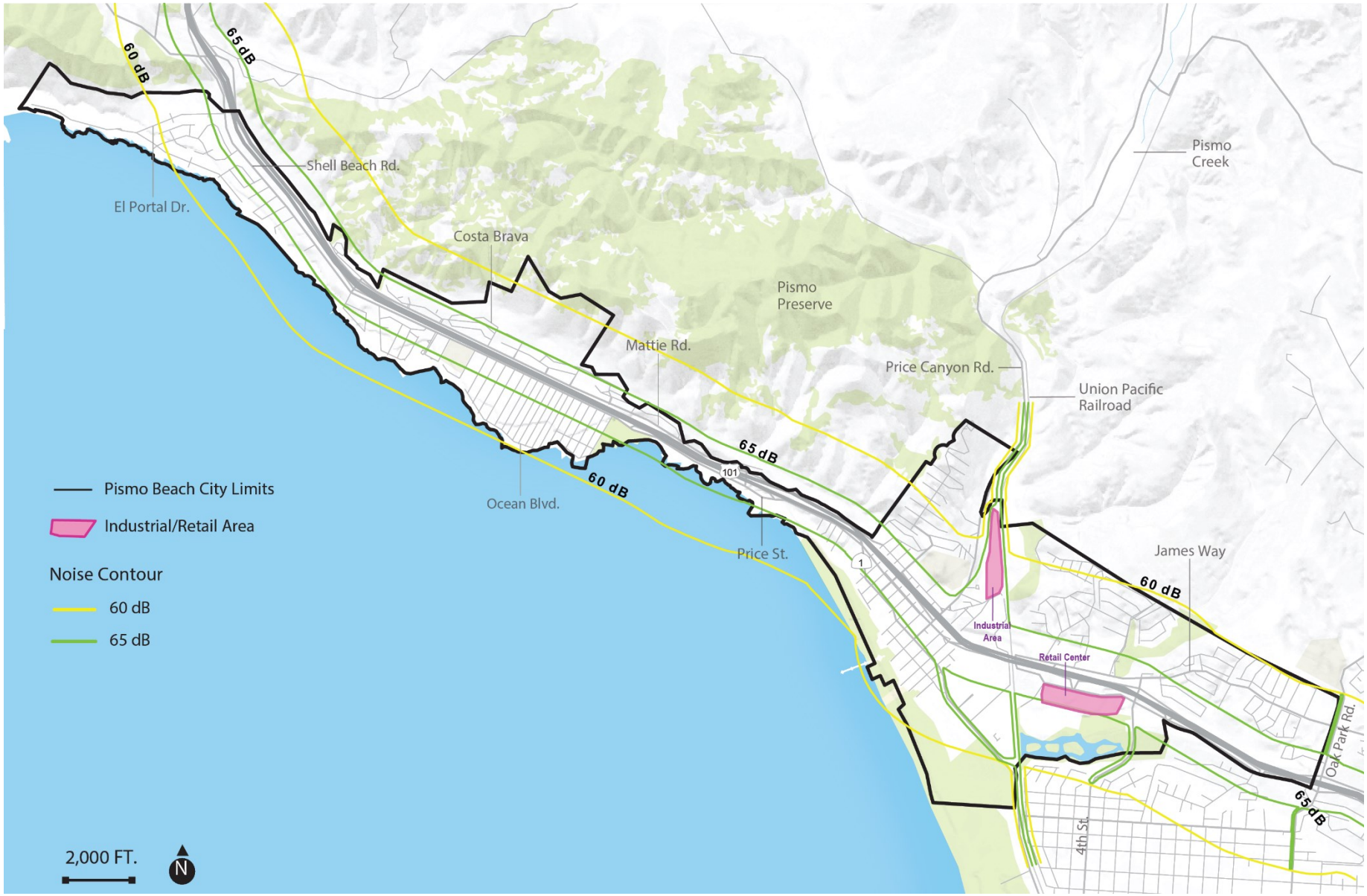


2.3 Noise-Producing Land Uses

Land uses that constitute a source of noise are generally associated with major industry, the City's infrastructure, or accessibility systems for residents. The City's primary source of noise is traffic along Highway 101, as well as other major local roads. Vehicular noise has three main component sources: engine/transmission noise, exhaust noise, and tire noise. The intensity of noise emissions from any given vehicle will vary with its size and other factors, such as speed, acceleration, braking, street grade and conditions of the street surface. Thus, a busy downtown arterial with stop and go traffic is often noisier than an open street with comparable traffic volumes. The most significant noise-producing land uses include public roads and highways, and railroads. Figure N-3 maps the most significant producers of existing noise and noise sensitive land uses within the City.

In order to characterize the noise levels associated with these sources, various approaches or methods were employed. For highway and road noise, the approach consisted of sound-level measurements and the use of a standard traffic noise model. Railroad noise was assessed based upon a 24-hour noise measurement to verify current rail noise level conditions. Pismo Beach has very few noise generating industrial uses which produce low amounts of noise, but stationary noise sources including the industrial area north of Bello Street and east of Price Canyon Road and the Retail Outlet Center were addressed with 24-hour sound level measurements. Please refer to the Technical Background Report in Appendix A for a detailed discussion of the various methods employed, as well as for field data and modelling results. Tables N-2 through N-4 summarize the results of community noise measurements conducted in 2019 for selected transportation-related and stationary noise sources in the City. Other noise sources not included in the inventory include noises from persons, pets, commercial enterprises, and construction sites. Noise level contours for State highways, selected roads, railroads, and other prominent stationary sources are provided in Figure N-3.

Figure N-3, Existing Noise Contours



Transportation-Related Noise

Highway Noise

Highways are a major noise source in many jurisdictions, and they are the primary means of circulation throughout Pismo Beach. Pismo Beach is primarily subject to noise impacts from US Highway 101 and State Route 1. As explained in more detail in the Technical Background Appendix, short-term sound-level measurements and manual traffic counts were performed for highway segments in representative areas of the City in order to allow the prediction of existing and Year 2040 traffic noise levels (expressed as CNEL). Table N-2 presents the results of the traffic noise modeling and identifies the distance from the center of the highway to the boundary of the 65 and 60 dBA CNEL contours. The distance to the 65 dBA CNEL contour is relevant because it represents the maximum recommended exterior noise exposure for multi-family residences; the 60 dBA CNEL contour is of interest because it represents the setback distance that should be considered when siting any new noise-sensitive use, in order to avoid exposure in excess of the recommended maximum level of 60 dBA CNEL. Figure N-3 provides noise contour maps for highways within Pismo Beach. The traffic noise modeling assumes flat ground adjacent to the highway, with no terrain or obstructions. Elevation can amplify or dampen noise levels; for example, noise from a lower elevated highway, such as in a valley, will be reflected upward, while noise from an elevated highway may dissipate. On flat ground, buffers such as sound walls or dense vegetation can be implemented to limit noise from escaping to surrounding areas. To address traffic noise along State highways, the California Department of Transportation (Caltrans) sometimes installs sound walls when new construction or widening is proposed to lessen noise impacts on proximate receptors. Sound walls can be costly and aesthetically unappealing, and they are only recommended when appropriate distance setbacks to noise-sensitive receivers, dense landscaping, landscaped berms, or other attenuation techniques cannot mitigate the noise exposure below levels required by the Pismo Beach Noise Ordinance (Section Pismo Beach Municipal Code, Chapter 9.24 Noise Control). In Pismo Beach, Caltrans has not pursued sound wall construction along existing highways.

Table N-2
Highway Noise Levels

Highways	Measured CNEL	Existing Distance to 65 CNEL (feet)	Existing Distance to 60 CNEL (feet)	YEAR 2040 Distance to 65 CNEL (feet)	YEAR 2040 Distance to 60 CNEL (feet)
Highway 1	69 dBA	70	223	79	250
Highway 101 (Price Street to Mattie Road)	76 dBA	561	1774	629	1991
Highway 101 (North of Avila Beach Drive)	76 dBA	574	1815	644	2037
Highway 101 (South of Oak Park Blvd)	76 dBA	574	1815	644	2037

Table N-2
Highway Noise Levels

Highways	Measured CNEL	Existing Distance to 65 CNEL (feet)	Existing Distance to 60 CNEL (feet)	YEAR 2040 Distance to 65 CNEL (feet)	YEAR 2040 Distance to 60 CNEL (feet)
Highway 101 (Price Street South to Price Street North)	76 dBA	574	1815	644	2037
Highway 101 (Mattie Road to Spyglass Drive)	76 dBA	587	1858	659	2084
Highway 101 (Spyglass Drive to Avila Beach Drive)	76 dBA	601	1901	674	2133
Highway 101 (Oak Park Blvd. to Fourth Street)	77 dBA	723	2285	811	2564
Highway 101 (Fourth Street to Price Street)	77 dBA	792	2506	889	2812

Notes: CNEL = Community Noise Equivalent Level.

Local Roadway Traffic Noise

The total number of vehicles, traffic speed, and the percentage of semi-truck traffic primarily dictates the level of traffic noise along a given segment of roadway. The primary source of noise from cars is high-frequency tire noise, which increases with vehicle speed. Trucks, motorcycles, and older cars also generate increased engine and exhaust noise, and semi-trucks also generate increased wind noise. Generally, during peak hours, traffic along roadways causes higher noise levels compared to noise levels during non-peak hours, unless congestion is present (which reduces the average vehicle speeds). As explained in more detail in the Technical Background Appendix, short-term sound level measurements and manual traffic counts were performed for roadway segments in representative areas of the City in order to allow the prediction of existing and Year 2040 traffic noise levels (expressed as CNEL). Table N-3 presents the results of the traffic noise modeling, and identifies the distance from the center of the roadway to the boundary of the 65 dBA and 60 dBA CNEL contours. The distance to the 60 dBA CNEL contour is of interest because it represents the setback distance that should be considered when siting any new noise-sensitive use, in order to avoid exposure above the recommended maximum level of 60 dBA CNEL; the 65 dBA CNEL is applicable to the siting of new multi-family residential development. Figure N-3 provides noise contour maps for roadways within the City under current conditions.

Table N-3
Local and Regional Roadway Noise Levels

Roads	Measured CNEL	Existing Distance to 65 CNEL (feet)	Existing Distance to 60 CNEL (feet)	YEAR 2040 Distance to 65 CNEL (feet)	YEAR 2040 Distance to 60 CNEL (feet)
Ocean Boulevard	48 dBA	--	--	--	--
North Fourth Street	~~70~~ 72 dBA	~~81~~137	~~256~~434	~~91~~161	~~287~~510
Mattie Road / Noyes Road	55 dBA	--	--	--	--
North Oak Park Boulevard	65 dBA	112	353	134	425
Price Canyon Road	~~69~~ 71 dBA	~~41~~100	~~131~~315	~~52~~125	~~165~~396
Shell Beach Road	~~63~~ 61 dBA	~~19~~--	~~59~~--	~~22~~--	~~69~~--

Note: "--" denotes the contour boundary is located within the roadway travel lanes.

With regard to the prediction of future traffic noise levels, the traffic model uses documented noise levels from vehicles including automobiles, medium trucks, heavy trucks, buses, and motorcycles, as derived from past measurements. With initiatives at the State level to increase the percentage of electric powered vehicles (with no engine exhaust noise), future traffic noise levels are likely to be lower than the predicted values for highways and local roadways as illustrated in Table N-2 and N-3.

Railroad Noise

The Union Pacific Railroad (UPRR) owns rail lines that traverse Pismo Beach, carrying UPRR freight trains and Amtrak passenger trains. The UPRR line extends from the Bello Street industrial area at the City's northern boundary, due south to the vicinity of Pismo State Beach before continuing on to Grover Beach.

Although train noise is intermittent, it is a significant source of noise due to its magnitude and associated vibration effects. Train noise is comprised of the sounds of the locomotive engine, wheel-on-rail noise, and train whistles near at-grade roadway crossings. There are no railroad crossings within the City, but locomotive engine and wheel contact noise are clearly audible at adjacent land uses.

Based on the 24-hour noise measurement, train operations result in a noise level of 66 CNEL dBA at 40 feet from the center of the rail line. Using the exterior attenuation rate for a line source, train noise is calculated to be reduced to 60 CNEL dBA at approximately 170 feet from the center-line of the tracks. Therefore, a 170-foot setback from the UPRR rail lines is reasonable for planning purposes to avoid elevated noise exposure levels for noise-sensitive land uses. Figure N-3 illustrates the location of rail lines in Pismo Beach, along with the location of the 65 CNEL dBA and 60 CNEL dBA contours associated with the rail right-of-way.

Stationary Source Noises

Noise from industrial businesses and large stationary sources varies but can contribute significant impacts on adjacent uses depending on the nature of industrial operations. Industrial operations often involve the use of mechanical equipment, generators, and vehicles that contribute to noise levels at industrial sites, particularly if operations occur outdoors. Pismo Beach has essentially one area devoted to industrial uses; the area is situated east of Price Canyon Road, generally north of Bello Street, and along the west side of the UPRR alignment (described above); this area currently serves as storage and staging for Pacific Gas and Electric. Measurement results indicate noise levels from the industrial area at the closest noise-sensitive land uses is not substantial compared to transportation source noise levels. The Pismo Beach Premium Outlets represent an important commercial retail stationary noise source, due to the concentration of large commercial structures, presence of multiple HVAC systems, and vehicle traffic. However, measurement results indicate noise from the Pismo Beach Premium Outlets are not substantial when compared to noise levels from adjacent transportation sources including Highway 101 and 5 Cities Drive. Table N-4 provides a summary of noise levels pertaining to each identified stationary source. The Technical Background Appendix provides a description of the methodology used and supporting data.

Table N-4
Stationary Source Noise Levels in Pismo Beach

Location	Stationary Source	Measured CNEL	Distance to 65 CNEL (feet)
Price Canyon Road/Bello Street	Industrial Area	56 dBA	108
5 Cities Drive	Pismo Beach Premium Outlets	64 dBA	47

Construction Noise

Construction noise typically involves the loudest common urban noise events associated with building demolition, grading, construction, large diesel engines, and truck deliveries and hauling. While temporary in nature, construction activity can create a substantial increase in noise volumes to adjacent receptors during the construction period. Construction noise is regulated by hours of operation and average sound level over that operation period, as outlined in the Pismo Beach Noise Ordinance (Pismo Beach Municipal Code, Chapter 9.24 Noise Control).

Infrastructure improvements such as street maintenance or widening can also create a significant source of noise. Infrastructure improvement projects would also be subject to the restrictions in the Noise Ordinance and required mitigation measures from the 2018 Circulation Element Mitigated Negative Declaration to minimize noise impacts.

3. Noise Compatibility

3.1 Land Use

Evaluating new development projects for noise impacts should be based on a comparison of the noise compatibility standards in Table N-5. Generally, new noise generating sources should not be placed in locations that would raise noise levels above those presented in Table N-5, and new noise sensitive uses should not be located in areas where exterior noise levels currently exceed the standards presented in Table N-5. New development can achieve these standards by either avoiding locating near incompatible land uses, or abating noise impacts through typical noise mitigation techniques, such as barriers or sound walls between noise generating sources and exterior use areas, dense vegetation placed between noise generating sources and adjacent exterior use areas, and/or increased building shell sound insulation to prevent elevated exterior noise levels from intruding into interior living areas.

A standard construction wood frame house reduces noise transmission by 15 dBA with windows open and 20 dBA with windows closed. Since interior noise levels for residences are not to exceed 45 dBA CNEL, the maximum exterior noise level for residences is 60 dBA CNEL without requiring additional insulation (with windows open condition). If a proposed new noise generating use will cause external noise levels at the property line of residential uses to exceed 60 dBA CNEL, buffers or other noise mitigation techniques will be required to be implemented by the sponsor of the new noise generating use. If new unplanned residential or other noise sensitive development is proposed to be located in an area with noise levels exceeding 60 dBA CNEL, it will be incumbent upon the new noise-sensitive development to reduce interior noise levels to 45 dBA CNEL. It should be noted that residential building construction in compliance with the 2020 building code reduces residential interior noise levels by 15-20 dBA and often lowers noise levels to acceptable standards.

Table N-5
Land Use Compatibility Guidelines for Development

<table>
<tr><th rowspan="2">Land Use</th><th colspan="7">Community Noise Exposure
CNEL or LDN (dBA)</th><th>Key</th></tr>
<tr><th>50</th><th>55</th><th>60</th><th>65</th><th>70</th><th>75</th><th>80</th><th></th></tr>
<tr><td rowspan="3">Residential, Theaters, Auditoriums, Music Halls, Meeting Halls, Churches</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Acceptable</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td rowspan="3">Specified land use is satisfactory. No noise mitigations measures are required.</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="3">Transient Lodging - Motels, Hotels</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Conditionally Acceptable</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

Table N-5
Land Use Compatibility Guidelines for Development

Land Use	Community Noise Exposure CNEL or LDN (dBA)							Key
	50	*55*	*60*	*65*	*70*	*75*	*80*	
Schools, Libraries, Museums, Hospitals, Nursing Homes								Use should be permitted only after careful study and inclusion of protective measures as needed to satisfy the policies of the Noise Element.
Playgrounds, Parks								**Unacceptable**
Office Buildings								Development is usually not feasible in accordance with the goals of the Noise Element.

3.2 Stationary Noise Exposure Limits

The City of Pismo Beach has adopted stationary noise limits that are applicable when proposing a new noise-sensitive land use (i.e., residential, transient lodging, hospital, nursing care, schools, libraries, auditoriums, meeting halls, churches, etc.). The introduction of new noise-sensitive land uses is expected to be minimal, as the City has no plans for expansion and has identified future growth to primarily be associated with infill development and redevelopment. Table N-6 illustrates the exterior noise limits from stationary noise sources at the property line of the proposed new noise-sensitive land use.

Table N-6
Maximum Allowable Noise Exposure for Noise Sensitive Uses: Stationary Noise Sources [1]

Metric	Daytime (7:00 a.m. to 10:00 p.m.)	Nighttime (10:00 p.m. to 7:00 a.m.)
Hourly L_{eq} dBA [2]	50	45
Maximum level dBA [2]	70	65
Maximum level, dBA-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 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.

3.3 Transportation Noise Exposure

The City of Pismo Beach has also adopted transportation noise limits that are applicable when proposing a new noise-sensitive land use (i.e., residential, transient lodging, hospital, nursing care, schools, libraries, auditoriums, meeting halls, churches, etc.). Table N-7 illustrates the exterior noise limits from transportation noise sources at the property line of the proposed new noise-sensitive land use.

Table N-7
Maximum Allowable Noise Exposure for Noise Sensitive Uses: Transportation Noise Sources [1]

Land Use	Outdoor Activity Areas [1] L_{dn}/CNEL dBA	Interior Spaces	
		L_{dn}/CNEL dBA	L_{eq} dBA [2]
Residential	60 [3]	45	--
Transient Lodging	60 [3]	45	--
Hospitals, Nursing Homes	60 [3]	45	--
Theaters, Auditoriums, Music Halls	--	--	35
Churches, Meeting Halls	60 [3]	--	45
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 standard 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 is it not possible to reduce noise in outdoor activity areas to 60 dBA L_{dn}/CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level up to 65 dBA 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. This determination will be made as the result of an acoustical study.

With regard to building construction to achieve adequate interior noise attenuation, Pismo Beach shall enforce the State Noise Insulation Standards (California Code of Regulations, Title 24) and Chapter 35 of the Uniform Building Code. It should be noted that residential building construction in compliance with the 2020 building code reduces residential interior noise levels by 15-20 dBA. Table N-8 identifies construction-related noise controls for residences, as a function of exterior noise level exposure from transportation sources.

Table N-8
Residential Construction Sound Controls Per Exterior Noise Exposure [1]

Exterior Noise Exposure Level (CNEL)	Required Building Components	Resulting Interior Noise Level (CNEL)
≤ 60	Compliance with 2020 CBC	45
60 - 65	Compliance with 2020 CBC Mechanical ventilation or air conditioning	45 (windows closed)
65 - 70	Compliance with 2020 CBC Mechanical ventilation or air conditioning Exterior doors and windows with minimum sound transmission class (STC) rating of 30	45 (windows closed)
> 70	Compliance with 2020 CBC Mechanical ventilation or air conditioning Exterior doors and windows with minimum sound transmission class (STC) rating > 30 Additional layer of plywood or drywall in exterior building shell construction *** SITE SPECIFIC NOISE STUDY REQUIRED**	45 (windows closed)

4. Noise Regulations

The following provides the Federal, State, and local framework for regulating noise in Pismo Beach.

4.1 Federal

Noise Control Act of 1972 (PL 92-574)
The Noise Control Act established a national policy "to promote an environment for all Americans free from noise that jeopardizes their public health and welfare." The Act provides for a division of powers between the Federal, State, and local governments, in which the primary Federal responsibility is for noise source emission control, with the states and other agencies retaining the rights to control noise sources and the level of noise within their communities and jurisdiction. The Noise Control Act was supplemented by the Quiet Communities Act of 1978 (PL 95-609).

4.2 State

California Environmental Quality Act
The California Environmental Quality Act (CEQA) considers generation of excessive noise an environmental impact. Implementation of CEQA ensures that during the decision-making stage of development review, City officials and the public will be informed of any potentially excessive noise levels and available mitigation measures to reduce these to acceptable levels, for any proposal subject to discretionary action in the City.

California Noise Insulation Standards (California Code of Regulations, Title 24)
Title 24 of the California Code of Regulations establishes residential insulation standards to be implemented during the building permit and construction process. Title 24 establishes an interior noise standard of 45 dBA for multiple unit residential structures and hotel/motel structures.

Caltrans Project Development Procedures Manual (Section 2 of Chapter 30: Highway Traffic Noise Abatement) and 23 CFR 772
These documents specify the Noise Abatement Criteria (NAC) for noise-sensitive land uses. The NAC are applicable to new highways and changes to the horizontal or vertical alignment of existing highways and are required for Caltrans and local agency projects that receive Federal funding or require Federal Highway Administration (FHWA) approval action. The NAC is an exterior noise level of 67 dBA CNEL for noise sensitive land uses (i.e., picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals).

4.3 Local

Noise Ordinance (Pismo Beach Municipal Code, Chapter 9.24 Noise Control)
The Pismo Beach Noise Ordinance defines limits for excessive noise and sets noise level generation limits to protect noise-sensitive land uses. While noise levels within commercial and industrial areas are given a higher allowance (up to 75 hourly L_{eq} dBA), noise from all sources is limited to no greater than 65 dBA CNEL at noise-sensitive land use receiver sites.

5. Goals, Policies, and Actions

Goal-1 - A quiet and healthful environment with minimal noise intrusion.

Policy 1.1 – Noise Generation Standards. Minimize the impact of noise generators by applying clear and appropriate standards during permit review and subsequent monitoring.

> ***Action 1.1a*** **- Enforce Stationary Noise Source Levels.** Enforce maximum and average noise level limits on permitted stationary sources based upon their impact on the property line of the nearest noise-sensitive receptor as outlined in Table N-6.
>
> ***Action 1.1b*** **- Enforce Construction Noise Standards.** Enforce the construction noise standards as outlined in the Pismo Beach Noise Ordinance (Pismo Beach Municipal Code, Chapter 9.24 Noise Control) and identify applicable restrictions and controls for meeting these requirements with each building permit application.

Policy 1.2 – Noise Mitigation and Attenuation. Mitigate the effect of noise from new commercial uses, project-generated traffic, and short-term construction on residential and other noise-sensitive land uses by applying feasible noise mitigation measures.

> ***Action 1.2a*** **– Attenuate Project-Related Stationary Source Noise Impacts.** After the applicable environmental review is finished, the City shall work with project applicants to attenuate stationary source noise impacts. Projects shall be designed to avoid long-term noise impacts or reduce those impacts using the following methods, or similar methods, as appropriate to meet the applicable noise levels presented in Table N-6:
>
> - Create a distance buffer between stationary mechanical equipment and noise-sensitive receivers by placing parking lots, storm drain facilities, and landscaping between major stationary equipment and adjacent receivers.
> - Provide sound barriers or enclosures for equipment with significant sound-generation
> - Where possible, place on-site buildings between major noise-generating equipment and the location of the closest adjacent noise-sensitive land use.
> - Where possible, locate/orient/direct/face/position noise-generating use in such a way that minimizes noise for noise-sensitive receivers.
> - Use facility perimeter sound barriers (i.e., solid walls) or landscaped berms to reduce noise levels at immediately adjacent noise-sensitive uses.
>
> ***Action 1.2b*** **- Require Noise Studies for Proposed Commercial Developments (CEQA).** When a proposed commercial development has the potential to generate noise levels that exceed the standards presented in Table N-6, a noise study and acceptable noise attenuation techniques to assure compliance with Table N-6 shall be required. For such commercial projects, the environmental review process required by CEQA shall be employed to identify the required analysis and determine appropriate mitigation. For the purpose of completing CEQA review, future noise levels shall be predicted for a

period of at least 10 years from the beginning of environmental document review process. Adherence to mitigation required to address significant noise impacts (as identified in the CEQA review document) shall be ensured via their incorporation in a required Mitigation Monitoring and Reporting Program (MMRP), to be adopted concurrent with approval of permits for the project. Adherence to mitigation described above shall also be ensured through conditions of approval. New single-family residences are to be exempt from noise studies, but shall require a buyer beware notice that acknowledges the residence may experience noise higher than City standards.

Action 1.2c **- Noise Study Requirements.** When a commercial project has the potential to generate noise levels in excess of Plan standards, a noise study and acceptable plans to assure compliance with the standards shall be required. The noise study shall measure or model the following, as appropriate: CNEL, L_{eq}, and L_{max} levels at property lines and, if feasible, receptor locations. Noise studies shall be prepared by qualified individuals using calibrated equipment under currently accepted professional standards and include an analysis of the characteristics of the project in relation to noise levels, all feasible mitigations, and projected noise impacts. Noise studies shall:

- Be the responsibility of the applicant, but accepted by the Planning Department.
- Include representative noise level measurements with sufficient sampling periods and locations to adequately describe local conditions.
- Estimate existing and projected (10 years) noise levels in terms of CNEL standards in Table N-6 or Table N-7, and compare predicted noise levels against such standards.
- Recommend appropriate mitigation to achieve compliance with the adopted policies and standards of the Noise Element and Noise Ordinance.
- Predict noise exposure at the property line after the prescribed mitigation measures have been implemented (quantify the noise reduction achieved by the mitigations). If the project does not comply with the adopted standards of the Noise Element and Noise Ordinance, the analysis must provide acoustical information for a statement of overriding considerations for the project.

Action 1.2d **- Attenuate Project-Related Traffic Noise Impacts Near Sensitive Uses.** Proposed discretionary developments that may result in an increase in traffic on roadways near existing noise-sensitive uses above levels allowed in the General Plan, should include, as appropriate and feasible, traffic calming design, low-noise pavement surfaces, sound barriers, or vegetated berms in order to minimize motor vehicle traffic noise.

Traffic calming design could include:

- Digital speed monitors
- Flashing crosswalk beacons
- Reduced speed limits

Policy 1.3 – Existing Land Use Incompatibilities. Help mitigate noise levels among existing incompatible land uses, as feasible, to enhance quality of life for noise impacted residents and other sensitive receptors.

***Action 1.3a* - Mitigate Stationary Source Noise Impacts on Existing Residential and Other Sensitive Uses as Feasible.** Upon receiving noise complaints, City Planning staff shall investigate the noise source associated with the complaint to determine if a violation of ordinance-specified noise limits is occurring. Such investigation may include the direct measurement of sound levels using a sound-level meter, or requiring the operator of the sound source to retain an acoustical professional to complete such measurements and analysis. Where sound levels exceed noise limits for stationary sound sources (i.e., Table N-6) the operator shall be required to install controls or alter operations in order to achieve compliance with the noise limits. Where sound levels investigated as the result of a complaint are in compliance, City Planning staff or the retained acoustical consultant may provide recommendations for reducing sound level annoyance in exterior or interior areas of the property for which the complaint has been submitted. The recommendations may be followed on a voluntary basis, but cannot be used to compel the noise generator into reducing sound levels to less than those required in Table N-6.

***Action 1.3b* - Noise Complaint Investigation.** When a noise complaint is submitted, City Planning staff shall investigate the noise source associated with the complaint to determine if a violation of noise ordinance limits is occurring. If the noise level from the offending source is clearly audible over the background noise levels at the property line of the complainant, an investigation would assume to be warranted. Such investigation may include the direct measurement of sound levels by City staff using a sound-level meter or requiring the operator of the sound source to retain an acoustical professional to complete such measurements and analysis. The investigation shall include:

- Completion of sound level measurements using a sound-level meter meeting American National Standards Institute (ANSI) Type 1 or Type 2 specifications.
- A measurement location at the property line of the receiving property located closest to the noise source associated with the complaint.
- Measurements for an appropriate duration to assess compliance with the applicable standard (for L_{eq} based standard, the measurement shall be no less than one hour, while the noise source is operating; for the CNEL standard, the sound measurement shall be not less than 24 hours in duration). Periodic measurements for temporary events or non-standard operating circumstances may be warranted to ensure compliance.
- Reporting that includes L_{eq} and L_{max} values, as well as calculated CNEL levels (where appropriate) associated with the noise measurements, and comparison of these noise levels with the Noise Element Policy and Noise Ordinance Standards.
- Recommendations for the operator of the noise source to achieve compliance (if a violation is occurring), or guidance for the receiving property to reduce noise exposure (if the noise is within allowable limits). The City can provide good

neighbor policies to the noise generating properties, however, if the noise is within allowable limits, these suggestions shall not be enforceable.

Action 1.3c **-** Support Attenuation of Highway Noise. The City should support efforts to reduce traffic noise levels on Highway 1 and Highway 101 along sections in proximity to concentrated residential development through prioritized roadway surface maintenance, use of noise-reducing surface treatments, traffic-safe tree or shrub plantings, window upgrades in facades of buildings facing the freeway, or, in cases of significant noise exposure, use of lower speed limits, as preferred alternatives over potential construction of sound walls. The City should advocate for Caltrans to contribute to the cost of these improvements, where feasible. Pismo Beach should also encourage enforcement of California Vehicle Code sections relating to adequate mufflers and modified exhaust systems.

Goal-2 - A pattern of land uses that protects residents and other sensitive receptors from excessive noise.

Policy 2.1 - Land Use Planning. Create general plan land use and zoning patterns that prevent or buffer community residents and other sensitive receptors from incompatible land uses.

Action 2.1a **- Consider Noise Compatibility in Land Use Planning.** The City shall consider the compatibility of proposed land uses and the noise environment when revising the General Plan and zoning documents and when reviewing development proposals. Noise levels for proposed land uses shall be consistent with the noise levels presented in Table N-5 (general noise exposure guidelines), Table N-6 (stationary noise source limits), and Table N-7 (transportation noise exposure limits).

Action 2.1b **- Prohibit or Attenuate New Sensitive Uses in Noise-Impacted Areas.** Prohibit new development of residential or other sensitive land uses in noise-impacted areas (as generally depicted by the limit of the 60 dBA CNEL contours illustrated on Figure N-4, 2040 Noise Contours) unless the project design includes effective noise-attenuation measures that reduce exterior noise to 60 dB L_{dn}/CNEL or less in exterior activity areas and 45 dB L_{dn}/CNEL or less in interior spaces with windows and doors closed, by using the best available noise-reduction technology, which may include the following techniques:

- Increase the distance between noise generators and noise-sensitive uses through the use of increased building setbacks and/or the dedication of noise easements.
- Place noise-tolerant land elements of the site plan such as parking lots, maintenance facilities, and utility areas between vicinity noise generators and on-site receivers.
- Use noise-tolerant structures, such as garages or carports, to shield noise-sensitive areas.
- Orient buildings so that the noise-sensitive portions of a project, including outdoor areas, are shielded from noise sources.

- Use berms and heavy landscaping to reduce noise levels.
- Use sound-attenuating architectural design and building features, such as:
  - Courtyards
  - Oriented openings and windows away from roadways
  - Double and triple paned windows
  - Additional layers of insulation, plywood, and drywall in the exterior building shell construction
  - Mechanical ventilation where feasible

Noise reductions associated with exterior traffic noise exposure are heavily dependent upon the configuration of site improvements with respect to the traffic noise source. Locating the primary exterior use area on the opposite side of a structure from the roadway can typically achieve a noise exposure level compliant with the 60 dBA CNEL recommended maximum exposure. With regard to building construction to achieve adequate interior noise attenuation, Pismo Beach shall enforce the State Noise Insulation Standards (California Code of Regulations, Title 24) and Chapter 35 of the Uniform Building Code. Refer also to Table N-8 (above) which identifies construction-related noise controls for residences, as a function of exterior noise level exposure from transportation sources.

Policy 2.2 - Highway Noise. Minimize vehicular and noise exposure for residents and occupants of noise-sensitive uses by planning land uses compatible with transportation corridors, and applying noise attenuation designs and construction standards.

Figure N-4, 2040 Noise Contours

