

CITY of LOMPOC

2030 General Plan

NOISE ELEMENT

INTRODUCTION AND AUTHORITY

The purpose of the Noise Element is to limit the exposure of the community to excessive noise levels. The Noise Element is to be used to guide decisions concerning land use and the location of common sources of excessive noise levels. To that end, the Noise Element identifies and addresses noise sources and establishes projected noise levels for significant noise generators.

The Noise Element also establishes goals, policies and implementation measures to alleviate issues associated with excessive noise within the City of Lompoc, including mobile, stationary, and nuisance noise sources. These goals, policies, and standards promote an appropriate pattern of land uses and help to ensure that the various sources of noise pollution do not compromise the community's goal of preserving the city's quiet and peaceful environment.

Sound Measurement, Metrics, and Propagation

Noise level (or volume) is generally measured in decibels (dB) using the A-weighted sound pressure level (dBA). The A-weighting scale is an adjustment to the actual sound power levels to be consistent with that of human hearing response, which is most sensitive to frequencies around 4,000 Hertz (about the highest note on a piano) and less sensitive to low frequencies (below 100 Hertz). In addition to the actual instantaneous measurement of sound levels, the duration of sound is important since sounds that occur over a long period of time are more likely to be an annoyance and cause direct physical damage or environmental stress.

The sound pressure level is measured on a logarithmic scale with the 0 dB level based on the lowest detectable sound pressure level that people can perceive (an audible sound that is not zero sound pressure level). Decibels cannot be added arithmetically, but rather are added on a logarithmic basis. Based on the logarithmic scale, a doubling of sound energy is equivalent to an increase of 3 dB. Because of the nature of the human ear, a sound must be about 10 dB greater than the reference sound to be judged as twice as loud. In general, a 3 dB change in community noise levels is noticeable, while 1 to 2 dB changes generally are not perceived. Quiet suburban areas typically have noise levels in the range of 40 to 50 dBA, while those along arterial streets are in the 50 to 60+ dBA range. Normal conversational levels are in the 60 to 65 dBA range and ambient noise levels greater than that can interrupt conversations.

One of the most frequently used noise metrics that considers both duration and sound power level is the equivalent noise level (Leq). The Leq is defined as the single steady A-weighted level that is equivalent to the same amount of energy as that contained in the actual fluctuating levels over a period of time. Typically, Leq is summed over a one-hour period.

The actual time period in which noise occurs is also important since noise that occurs at night tends to be more disturbing than that which occurs during the daytime. Because noise levels, and sensitivity to noise, vary over the course of the day, noise exposure is typically quantified in terms of a weighted average

NOISE ELEMENT

exposure, using the metrics of Day-Night average level (Ldn). Ldn recognizes this characteristic by weighting the hourly Leqs over a 24-hour period. The weighting used in Ldn calculations involves the addition of 10 dBA to actual nighttime (10 PM to 7 AM) noise levels. The City has adopted its noise exposure land use compatibility standards in terms of Ldn (refer to Table N-1 below).

Sound Propagation and Attenuation

Noise levels typically attenuate at a rate of 6 dB per doubling of distance from point sources such as industrial machinery (Harris, 1979). For example, a person standing 25 feet from an industrial machine may experience noise levels of 75 dBA, while a person standing 50 feet from the same noise source would experience noise levels of 69 dBA, and a person standing 100 feet from the source would experience noise levels of 63 dBA. Noise from lightly traveled roads typically attenuates at a rate of about 4.5 dB per doubling of distance. Noise from linear sources such as heavily traveled roads typically attenuates at about 3 dB per doubling of distance (Harris, 1979). Because of this attenuation of sound levels with distance from the source, building setbacks are one way to maintain acceptable sound exposure levels for noise-sensitive uses.

The attenuation rates discussed above are based flat topography with hard ground surfaces and no natural or manmade impediments to sound propagation (topographic barriers, vegetation, walls, and buildings). A reduction in sound exposure is achieved when there are such natural and manmade barriers, and sound-berms, sound-walls, noise insulation are all common ways to reduce or mitigate excessive sound exposure levels.

Noise Sources and Receptors

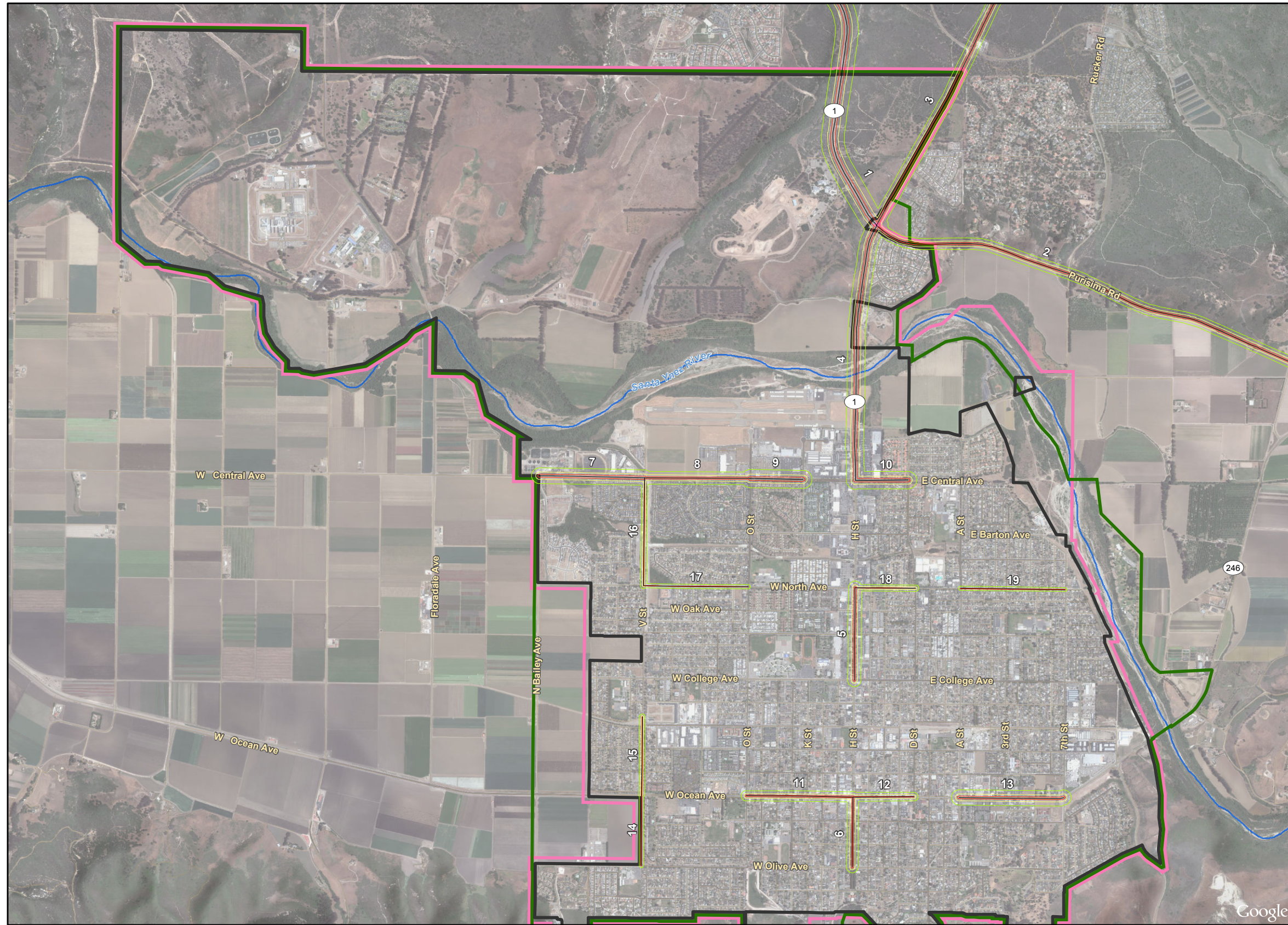
Existing noise sources in or near the City of Lompoc include:

- ❖ Roadway Noise
- ❖ Commercial and Industrial Operations
- ❖ Agricultural Production
- ❖ Union Pacific Railroad
- ❖ Lompoc Airport
- ❖ Vandenberg Air Force Base (VAFB)

Roadway Noise

Roadway traffic is the primary source of noise in the City. Noise generated by roadways is dependent on the speed and volume of vehicles that use roadways. H Street/ Highway 1 carries the most traffic through the area, while Purisima Road (west of H Street/ Highway 1) and Ocean Avenue/Highway 246 are also major sources of roadway noise in the City. The existing 60 dBA Ldn contour from H Street/Highway 1 ranges from 141 to 224 feet from the roadway, while the existing 60 dBA Ldn contour from Purisima Road (west of H Street/Highway 1) is 286 feet from the roadway centerline. The existing 60 dBA Ldn contour from Ocean Avenue/Highway 246 ranges from 108 to 147 feet from the roadway centerline. Figure N-1 depicts roadway noise exposure contours for existing (2009) traffic volumes on major roads in the General Plan area.

Figure N-2 depicts roadway noise exposure under future (2030) full General Plan buildout conditions. This latter figure represents a worst case scenario as it assumes full buildout of all vacant and underdeveloped parcels and also does not reflect any reduction in roadway traffic volumes through alternative transportation modes.



Legend

- City Limits
- City Urban Limit Line
- City Sphere of Influence
- Road Segment
- 70 dB
- 65 dB
- 60 dB

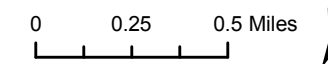
Road Segment	70 dB	65 dB	60 dB
Purisima Road			
Dist From Centerline in Ft			
1 - West of H Street/Highway 1	62	133	286
2 - East of H Street/Highway 1	24	66	143
H Street/Highway 1			
3 - North of Purisima Road	31	78	168
4 - North of Central Avenue	47	104	224
5 - North Avenue to College Avenue	30	77	166
6 - Ocean Avenue to Olive Avenue	24	66	141
Central Avenue			
7 - Bailey Avenue to V Street	38	90	195
8 - V Street to O Street	29	74	160
9 - O Street to L Street	48	105	227
10 - H Street/Highway 1 to D Street	46	101	218
Ocean Avenue/Highway 246			
11 - O Street to H Street/Highway 1	21	60	129
12 - H Street/Highway 1 to D Street	RW	50	108
13 - A Street to 7 th Street	37	88	189
V Street			
14 - Olive Avenue to Ocean Avenue	RW	RW	51
15 - Ocean Avenue to Laurel Avenue	RW	27	71
16 - North Avenue to Central Avenue	RW	30	76
North Avenue			
17 - V Street to O Street	RW	RW	53
18 - H Street/Highway 1 to D Street	RW	33	82
19 - A Street to 7 th Street	RW	RW	50

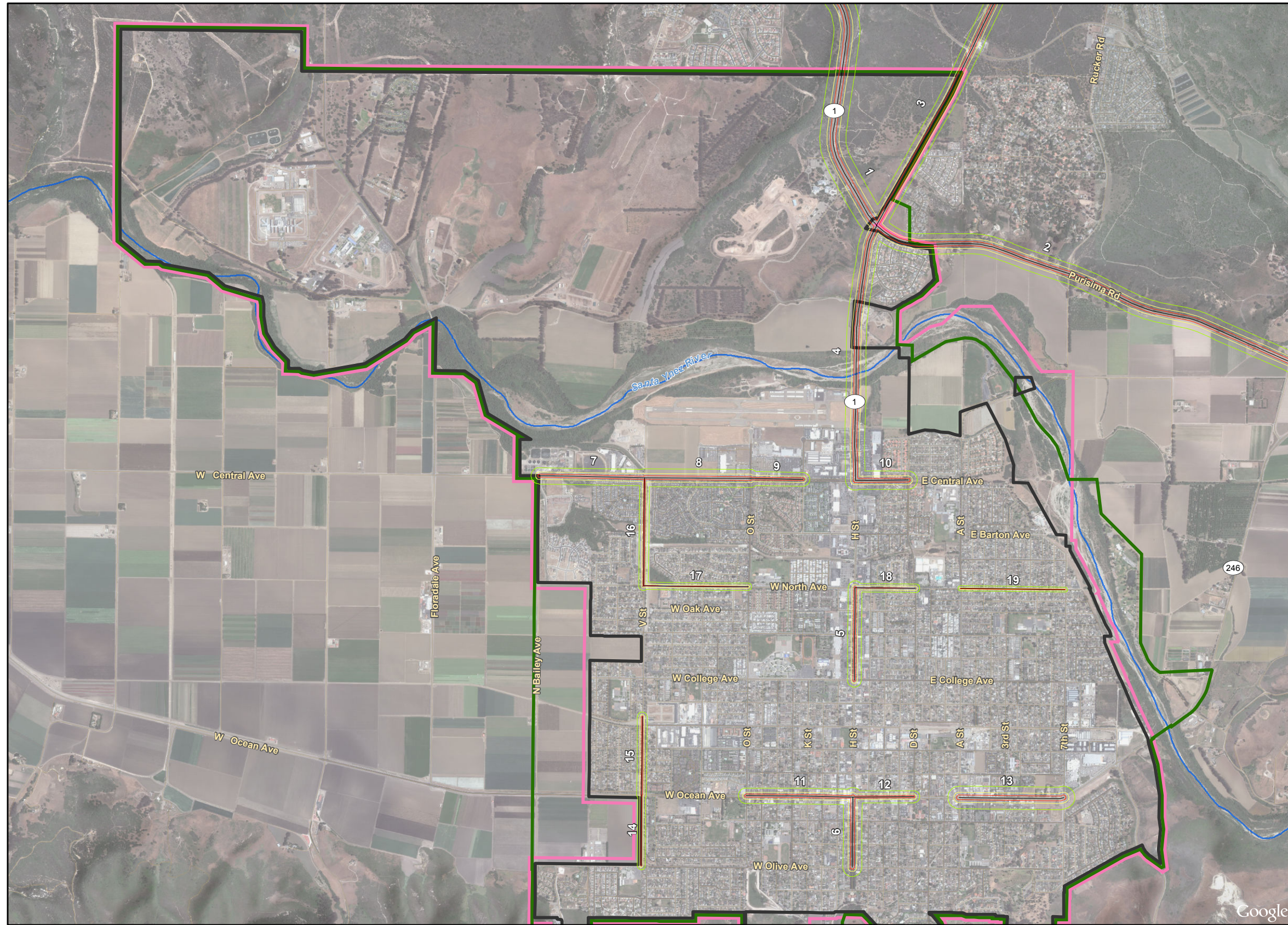
RW: Noise contour falls within roadway right-of-way.

Contour distances assume level land with no barriers or obstructions. In reality, varied topography, in combination with the presence of buildings and other barriers, will reduce the distance from the noise source to the dB contours in many instances. In other words, the noise levels presented in this table are "conservative" estimates that potentially overstate the actual noise level in many locations.

Existing Noise Contours

Imagery provided by Google and its licensors © 2014.
City limit layers by City of Lompoc, 2014.





Legend

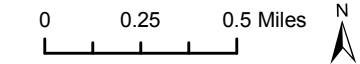
- City Limits
- City Urban Limit Line
- City Sphere of Influence
- Predicted Traffic Noise Contours**
- Road Segment
- 70 dB
- 65 dB
- 60 dB

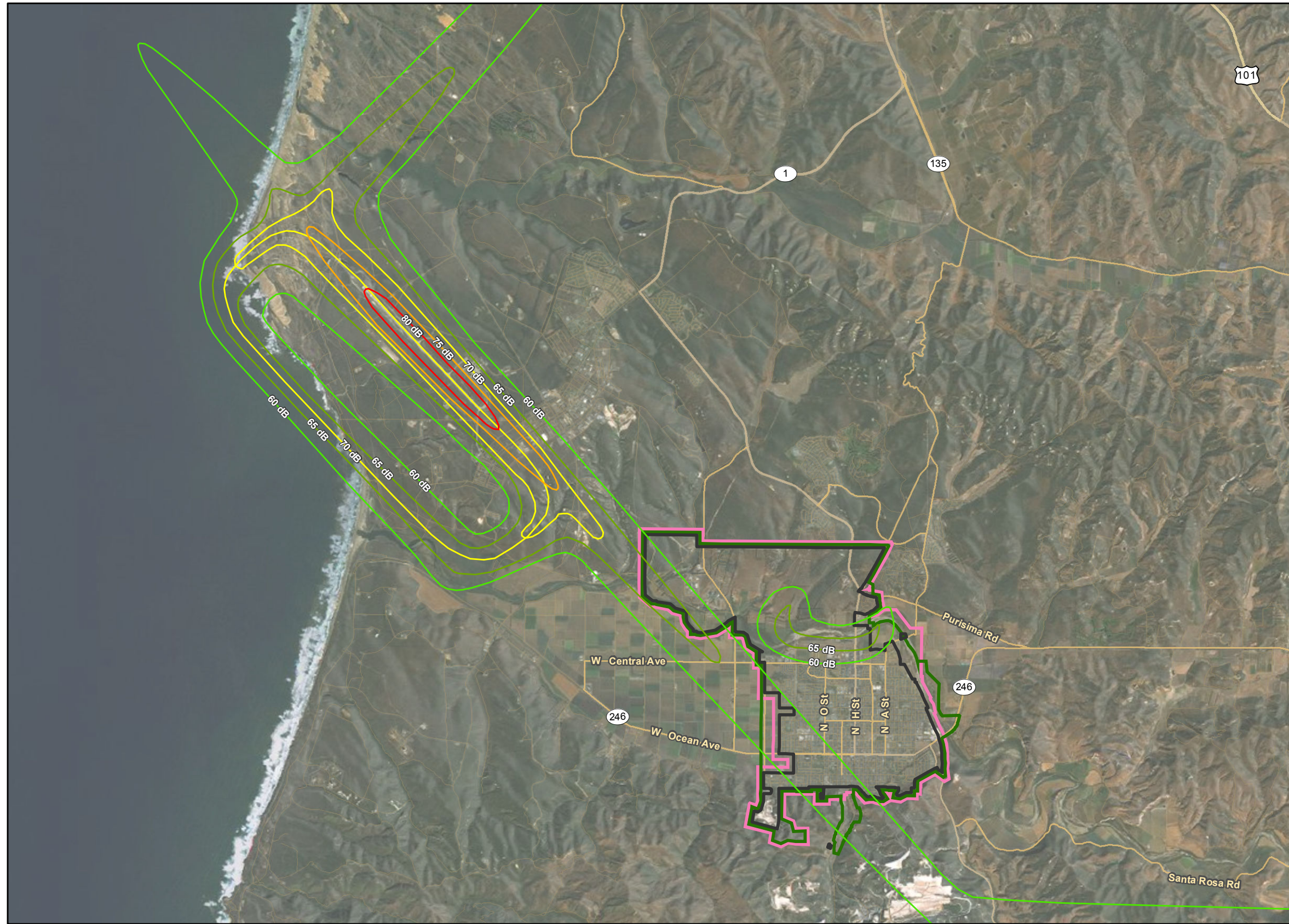
Road Segment	70 dB	65 dB	60 dB
Purisima Road	Dist From Centerline in Ft		
1 - West of H Street/Highway 1	70	151	326
2 - East of H Street/Highway 1	54	117	253
H Street/Highway 1			
3 - North of Purisima Road	46	102	220
4 - North of Central Avenue	53	115	247
5 - North Avenue to College Avenue	32	80	172
6 - Ocean Avenue to Olive Avenue	50	109	234
Central Avenue			
7 - Bailey Avenue to V Street	42	95	205
8 - V Street to O Street	48	105	226
9 - O Street to L Street	32	80	172
10 - H Street/Highway 1 to D Street	50	107	231
Ocean Avenue/Highway 246			
11 - O Street to H Street/Highway 1	39	91	196
12 - H Street/Highway 1 to D Street	26	69	149
13 - A Street to 7 th Street	60	130	280
V Street			
14 - Olive Avenue to Ocean Avenue	RW	45	100
15 - Ocean Avenue to Laurel Avenue	19	56	121
16 - North Avenue to Central Avenue	19	57	122
North Avenue			
17 - V Street to O Street	RW	38	90
18 - H Street/Highway 1 to D Street	RW	51	109
19 - A Street to 7 th Street	RW	22	63

*RW: Noise contour falls within roadway right-of-way.
Contour distances assume level land with no barriers or obstructions. In reality, varied topography, in combination with the presence of buildings and other barriers, will reduce the distance from the noise source to the dB contours in many instances. In other words, the noise levels presented in this table are "conservative" estimates that potentially overstate the actual noise level in many locations.*

Predicted Noise Contours with
Maximum Development

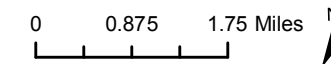
Imagery provided by Google and its licensors © 2014.
City limit layers by City of Lompoc, 2014.





- Legend**
- City Limits
 - City Urban Limit Line
 - City Sphere of Influence
- Airport Noise Contours**
- 60 dB
 - 65 dB
 - 70 dB
 - 75 dB
 - 80 dB

Imagery provided by ESRI and its licensors © 2014.
City limit layers by City of Lompoc, 2014.
Department of the Air Force, September 1986.



Airport Noise Exposure

Industrial and Commercial Operations

Industrial and commercial operations can be substantial sources of noise, depending on the type and hours of operation. Commercial/industrial operations can result in objectionable noise levels when they are adjacent to noise sensitive land uses. Industrial uses occur in industrially zoned areas of the City such as the business park uses north of Central Avenue near the Lompoc Airport, and along sections of Laurel Avenue. Noise generation within an industrial or commercial facility or in close proximity to many types of agricultural equipment is controlled indirectly by Federal and State employee health and safety regulations (e.g., OSHA and Cal-OSHA), but exterior noise emissions from such operations have the potential to exceed acceptable standards at nearby noise-sensitive land uses. Typical commercial and industrial noise sources include loading dock operations, parking lot activity, on-site equipment (including heating and air conditioning), and heavy truck idling.

Commercial uses generate operational noise, including noise generated by vehicles using commercial facilities. Operation of commercial and retail uses often generate noise associated with mechanical equipment (such as generators, heating, ventilation and air conditioning (HVAC) units), deliveries, trash hauling activities, and customer and employee use of the facilities. The highest concentrations of commercial uses in the City are located along the Ocean Avenue/Highway 246 and H Street/Highway 1 corridors. In some areas, residential uses are located immediately adjacent to commercial uses.

Agricultural Operations

Agricultural operations surround the City on the eastern, western, and southern borders. Agricultural operations produce noise associated with equipment such as wind machines, diesel engines, aerial application aircrafts (crop dusters), and tractors. In some locations, agricultural operations are located immediately adjacent to residential uses within City Limits

Other Sources of Noise

Noise from the Lompoc Airport or the VAFB is dependent upon approach and take-off flight patterns, as well as the distance between the sensitive uses and the airports. Figure N-3 shows noise exposure resulting from aircraft operations at the Lompoc Airport and VAFB.

Noise generated by the Union Pacific Railroad (UPRR) is limited to a few trips per week that occur on this section of track since it primarily serves as a cargo rail that delivers to and from Imerys Filtration Minerals, Inc. Although this rail segment travels within a few feet of residential units, the limited, daytime only, use of this rail segment, railway-generated noise does not produce incompatible levels of noise.

Sensitive Receptors

Certain types of development and land uses are most susceptible to disturbance from objectionable noise levels and must be identified in the Noise Element. These noise sensitive uses, including: residences, schools, hotels/motels, and open space, are considered most sensitive to noise intrusion under the Lompoc General Plan, and therefore have more stringent noise exposure targets than most commercial or agricultural uses that are not susceptible to impacts such as sleep disturbance. In most cases in the City, noise sensitive uses such as residential development are located in quiet areas lacking major noise sources. However, noise sensitive uses located in the vicinity of, or adjacent to, major roadways such as Highway 1 and Highway 246 may experience noise levels exceeding City standards.

NOISE ELEMENT

Noise Ordinance and Other Regulatory Requirements

The City's Noise Ordinance (Section 8.08 of the Lompoc Municipal Code) contains the standards which set forth regulations controlling loud noises from animals, amplified music and musical instruments, construction, and vehicle repairs or other noise generating facilities. The City's Zoning Ordinance establishes performance standards for control of noise from industrial operations and facilities, with a requirement for acceptable noise levels at the property lines of such uses. If noise levels at the property line exceed these standards, noise shielding, muffling, or other noise mitigation measures is required.

GOALS AND POLICIES

Goal 1

Minimize the amount of noise to which the community is exposed.

Policies

- Policy 1.1 The City shall require each land use to maintain noise levels at their property line in compliance with City standards.
- Policy 1.2 The City shall place a priority upon control of noise at the noise source.
- Policy 1.3 The City shall periodically update the Noise Ordinance to minimize noise exposure within the City. The Noise Ordinance update and acoustical studies shall use the Day-Night Average Level (Ldn) methodology for quantification of noise exposure.
- Policy 1.4 The City shall encourage Vandenberg AFB to utilize flight patterns which are the least disturbing to residential areas of the City.
- Policy 1.5 The City shall coordinate with federal, state, and local agencies to minimize noise exposure within the City.
- Policy 1.6 The City shall use noise reduction as one criterion in equipment purchasing policies.
- Policy 1.7 Truck deliveries to commercial uses on mixed-use development sites shall be limited to between the hours of 8:00 AM and 6:00 PM on weekdays and Saturdays. No deliveries shall occur on Sundays. [Final EIR Mitigation Measure N-3(a)]
- Policy 1.8 The City shall encourage the use of alternative transportation modes such as bicycle paths and pedestrian walkways to minimize automobile traffic and its associated noise.

Goal 2

Minimize noise generated by future development.

Policies

- Policy 2.1 The City shall use the noise standards presented in table entitled "Interior and Exterior Noise Standards" in determining land use designations and maximum noise levels allowable for new developments. In situations of overlapping Noise Standards, the lower noise level standard shall apply unless it can be found that the circumstances of the

project allow for a less conservative interpretation based on the specific type of use, the benefits of the project, and the ability to mitigate the noise impacts.

- Policy 2.2 The City shall require acoustical studies, prepared by a qualified acoustical engineer, for new development projects anticipated to either: (1) result in an ambient increase of five dBA Ldn; or (2) produce noise within five dBA/Ldn of the noise standard or greater than the noise standard for the proposed land use(s) under existing or future conditions. Should noise abatement be necessary, the City shall require the implementation of mitigation measures based on a detailed technical study prepared by a qualified acoustical engineer (i.e., a Registered Professional Engineer in the State of California with a minimum of three years of experience in acoustics).
- Policy 2.3 The City shall minimize noise exposure in the vicinity of the Lompoc Airport by maintaining consistency with the adopted Lompoc Airport Master Plan.
- Policy 2.4 The City shall continue to enforce its Noise Ordinance to minimize noise conflicts between adjacent land uses. The Noise Ordinance establishes noise limits that cannot be exceeded at the property line.
- Policy 2.5 Common walls between horizontal (side-by-side) and vertical (stacked) mixed use commercial/residential development shall be noise-insulated to provide attenuation of indoor noise levels. [Final EIR Mitigation Measure N-3(b)]
- Policy 2.6 External noise-generating equipment associated with commercial uses (e.g., HVAC units, etc.) that are located in mixed use developments and/or adjacent to residential uses shall be shielded or enclosed with solid sound barriers. [Final EIR Mitigation Measure N-3(c)]
- Policy 2.7 Emphasize the following City preferred noise management strategies as an alternative to the construction of noise barriers:
- Avoid the placement of noise-sensitive uses within areas of high ambient noise
 - Orient buildings in a manner that shields noise sensitive portions of a project from noise sources
 - Use sound attenuating architectural design and building features

IMPLEMENTATION MEASURES

- Measure 1 The City shall amend the Noise Ordinance to include the following provisions:
- Establish noise limits which cannot be exceeded at the property line; [Policies 1.1 and 1.2]
 - Require an acoustical study to demonstrate compliance with Noise Standards prior to approval of: new commercial or industrial projects near existing residential areas and new residential developments within the 60 Ldn contour of existing stationary noise sources; [Policy 2.1]

NOISE ELEMENT

- Require development projects in areas having noise levels which exceed the Noise Standards for the proposed land use to add noise attenuation measures during the development review process to meet the Noise Standards. These attenuation measures may include: landscaped-sound buffers, berms, setbacks or open space, building design or orientation, prohibiting window openings, door openings, or bedrooms on the sides of residential units facing noise sources which exceed the Noise Standards, enhanced wall or roof insulation, placement of air conditioning units in locations which minimize noise exposure, or other measures; [Policy 2.2]
- Require noise insulation of residential units constructed within the 60 dBA Ldn contour; [Policy 2.2]
- Add provisions which restrict noise from landscape maintenance devices, auto alarms and stereos, stationary sources, and the hours of operation of noise sources. Expand provisions restricting radios in parks and other non-residential areas; and [Policies 1.2 and 1.3]
- Establish guidelines for conducting acoustical studies, monitoring noise sources, and providing noise attenuation. [Policy 2.3]

Measure 2 The City should investigate noise impacts from stationary sources in response to noise complaints and then enforce existing noise standards if City noise standards are being exceeded. [Policies 1.4 and 1.6]

Measure 3 The City shall periodically review and amend as necessary, the projected noise contours for the Lompoc Airport. [Policy 2.3]

Measure 4 The City shall amend the Noise Ordinance to include the following measures:

- For construction near sensitive receptors, require that noisy construction activities be scheduled for periods, such as between 8 a.m. and 6 p.m. on weekdays and 9 a.m. to 6 p.m. on Saturday, when loud noises would have the least impact on adjacent residents or other sensitive receptors [Policy 2.4];
- Develop a construction schedule that minimizes potential cumulative construction noise impacts and accommodates particularly noise-sensitive periods for nearby land uses (e.g., for schools, churches, etc);
- Where feasible, require use of caissons instead of driven piles to reduce the intensity level and duration of noise impacts [Policy 2.4];
- Where feasible, construct temporary, solid noise barriers between source and sensitive receptor(s) to reduce off-site propagation of construction noise [Policy 2.5].
- Require internal combustion engines used for construction purposes to be equipped with a properly operating muffler of a type recommended by the manufacturer. Also, require impact tools to be shielded per manufacturer's specifications [Policy 2.4].

NOISE ELEMENT

Measure 5 The ultimate noise contours at the design capacity of existing and proposed roadways shall be used for preliminary planning purposes (see Figure N-1 and N-2) and refined when detailed site-specific acoustic reports are prepared for new developments. In the absence of specific noise contour information, the following table shall serve as a general planning guide to determine the potential "worst case" future noise levels and shall be used to determine required setback distances [Policy 2.1].

**Table N-1.
Interior and Exterior Noise Standards**

Land Use Categories		Ldn	
Categories	Uses	Interior1	Exterior2
Residential	Single Family, Duplex, Multi-Family, Mobile Home	45 ³	60 ⁴
Commercial & Industrial	Retail, Restaurant	55	65
	Motel/Hotel	45	60 ⁴
	Professional Offices, Movie Theater, Auditorium	45	65
	Manufacturing, Utilities, Warehousing, Agriculture	65	75
Community Facility	Hospital, School, Nursing Home, Church, Library, Civic Offices, Parks	45	65
Open Space	Passive Outdoor Recreation	--	60 ⁴

Notes

1. Interior areas exclude bathrooms, closets, and corridors.
2. Exterior areas are limited to the following: private yards or patios of residential uses; restaurant patios; motel recreation areas; office, theater, or hospital patios or assembly areas; school playgrounds; nursing home, library, or civic office assembly areas; and park picnic areas.
3. If achievement of the interior noise standards requires that windows and doors remain closed, air conditioning or mechanical ventilation is required.
4. In areas affected by aircraft noise, the standard is 65 Ldn with the stipulation that the noise level exclusive of the aircraft-generated noise cannot exceed 60 Ldn.

**Table N-2.
Design Noise Levels Adjacent to Roadways**

Roadway Classification	Lane ^a Geometrics	Design ^b Capacity	Ldn ^c At 100t	Distance to Contours (Ft.) ^d		
				70dBA	65dBA	60dBA
Expressway	4D	30,000	67.0	66	134	285
Major Arterial	4D	30,000	64.3	47	90	189
Minor Arterial	4U	20,000	62.5	R/W	69	146
Minor Arterial	2D	12,500	59.1	R/W	42	87
Minor Arterial \ Collector	2U	10,000	58.1	R/W	35	75

- a. D=Divided U=Undivided.
- b. The ultimate daily design capacity shown in terms of vehicles per day.
- c. Ldn values are at 100 feet from all roadway centerlines (see Appendix F for assumptions).
- d. All distances are measured from the centerline. R/W means that the Ldn contour falls within the right-of-way

NOISE ELEMENT

This page intentionally left blank.