

3.8 Noise

This section presents the environmental setting and impact assessment for noise in the proposed 2030 Lemoore General Plan. Noise impacts assessed include traffic noise, construction noise, and Naval Air Station Lemoore aircraft noise.

ENVIRONMENTAL SETTING

A thorough understanding of the noise characteristics of the built environment as well as the noise sensitivity of land uses will allow Lemoore citizens and officials to make smart decisions to prevent noise impacts before they occur. Noise is commonly defined as undesirable or unwanted sound. Noises vary widely in their scope, source, and volume, ranging from individual occurrences such as leaf blowers, to the intermittent disturbances of overhead aircraft, to the fairly constant noise generated by traffic on freeways. Noise can have real effects on human health, including hearing loss and psychological effects or irritability from lack of sleep. Noise is primarily a concern with regard to noise-sensitive uses such as residences, schools, churches, and hospitals.

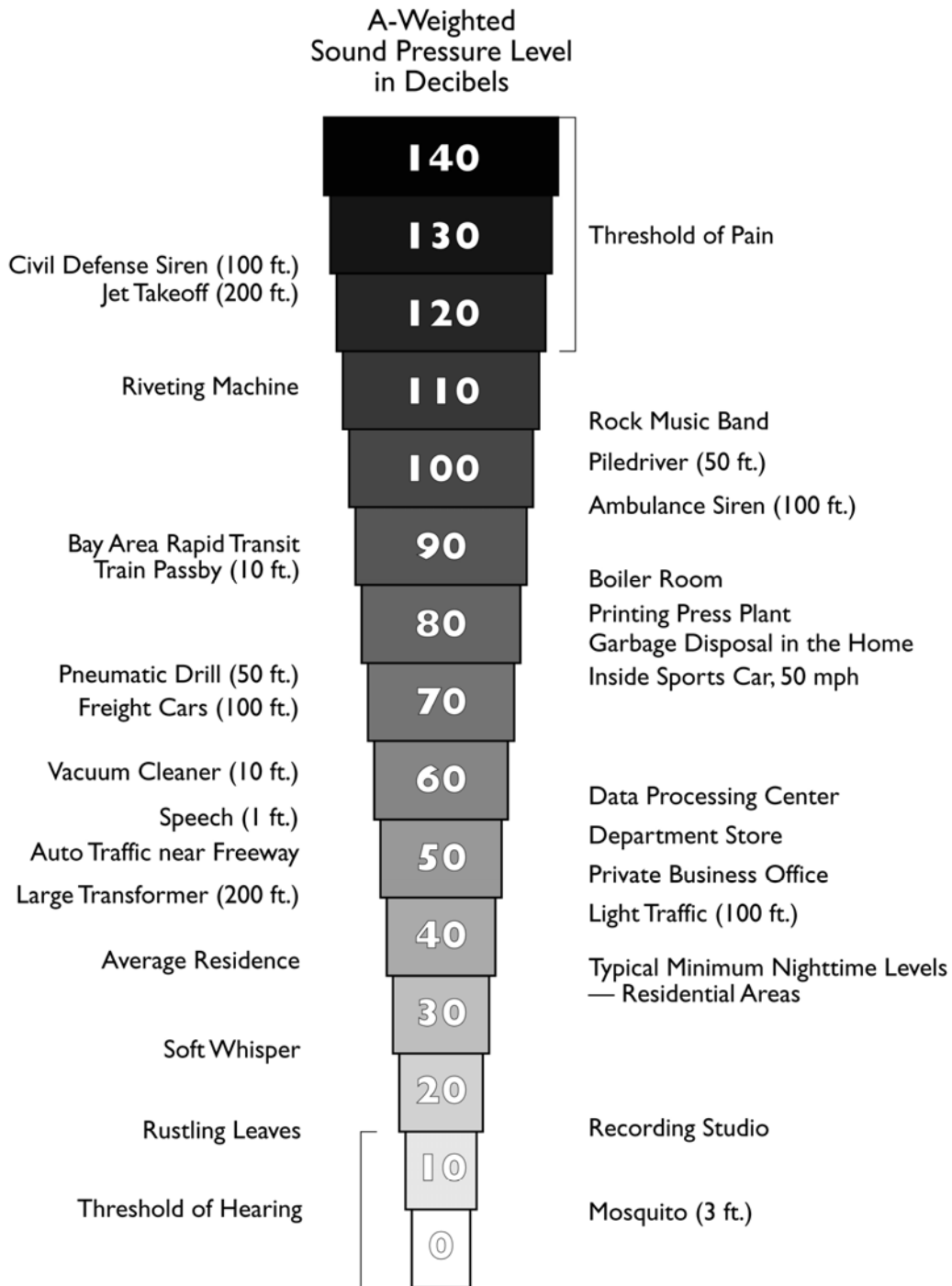
PHYSICAL SETTING

Measuring Sound

Sound is generated by sound waves traveling outward from a source. Sound waves exert a sound pressure level (commonly called "sound level") measured in decibels (dB). Environmental noise is usually measured in *A-weighted* decibels, a metric corrected measurement for the variation in frequency response of the human ear. The A-weighted scale is used to describe all noise levels discussed in this section.

Three aspects of noise are used in assessing the community noise environment:

- *Level* (e.g., magnitude or loudness) of sound. Sound levels are measured and expressed in decibels (dB) with 10 dB roughly equal to the threshold of hearing. **Figure 3.8-1** shows the decibel levels associated with a number of common sounds.
- *Frequency composition or spectrum* of the sound. Frequency is a measure of the pressure fluctuations per second, measured in units of hertz (Hz). The characterization of sound level magnitude with respect to frequency is the sound spectrum, often described in octave bands, which divides the audible human frequency range (e.g., from 20 to 20,000 Hz) into ten segments.
- *Variation* in sound level with time, measured as noise exposure. Most community noise is produced by many distant noise sources that change gradually throughout the day and produce a relatively steady background noise with no identifiable source. Identifiable events of brief duration, such as aircraft flyovers, cause the community noise level to vary from instant to instant.



(n ft.) = Distance in feet between source and listener

Figure 3.8-1
Typical Sound Levels

Reporting Noise Levels

Measuring and reporting noise levels involves accounting for variations in sensitivity to noise during the daytime versus nighttime hours. Noise descriptors used for analysis need to account for human sensitivity to nighttime noise; background noise levels are generally lower than in the daytime and outside noise intrusions are more noticeable. Common descriptors include the Community Noise Equivalent Level (CNEL) and the Day-Night Average Level (DNL). Both reflect noise exposure over an average day with weighting to reflect the increased sensitivity to noise during the evening and night. The two descriptors are roughly equivalent. The CNEL descriptor is used in relation to major continuous noise sources, such as aircraft or traffic, and is the reference level for the Noise section of this EIR.

Knowledge of the following relationships is helpful in understanding how changes in noise and noise exposure are perceived:

- Except under special conditions, a change in sound level of 1 dB cannot be perceived;
- A 3 dB change is considered a just-noticeable difference;
- A 5 dB change is required before any noticeable change in community response would be expected. A 5 dB increase is often considered a significant impact; and
- A 10 dB increase is subjectively heard as an approximate doubling in loudness and almost always causes an adverse community response.

Noise Sources in Lemoore

The major noise sources in Lemoore are related to vehicle traffic on highways and major arterial roads and aircraft based at Naval Air Station Lemoore (NAS Lemoore). Other noise sources include rail transportation, industrial activities, and the Lemoore Midget Raceway.

Traffic Noise

Traffic noise depends primarily on the speed of traffic and the percentage of truck traffic. The primary source of noise from automobiles is high frequency tire noise, which increases with speed. In addition, trucks and older automobiles produce engine and exhaust noise, and trucks also generate wind noise. While tire noise from cars is generally located at ground level, truck noise sources can be located as high as ten to fifteen feet above the roadbed due to tall exhaust stacks and higher engines. Sound walls are not effective for mitigating such noise unless they are very tall. **Table 3.8-1** and **Figure 3.8-2** shows the existing land use exposed to street noise contours.

Both SR-198 and SR-41 produce substantial traffic noise in the Planning Area. Arterial streets with substantial noise levels include Lemoore Avenue from SR-198 to Hanford-Armona Road, and Cinnamon Drive, D Street, and Bush Street between SR-41 and Lemoore Avenue.

Table 3.8-1 Existing Land Use Exposure to Traffic Noise (acres)

| <i>Land Use</i> | <i>51-55 dB</i> | <i>56-60 dB</i> | <i>61-65 dB</i> | <i>66-70 dB</i> |
|---|-------------------|------------------|------------------|------------------|
| Agriculture/Rural | 581.4 | 317.6 | 117.0 | 19.3 |
| Very Low Density Residential | 82.2 | 50.8 | 18.8 | 5.1 |
| Single Family Residential | 329.1 | 168.1 | 51.5 | 7.7 |
| Low Density Multi-Family Residential | 15.1 | 5.7 | 1.4 | 0.2 |
| Multi-Family Residential | 43.7 | 30.8 | 7.8 | 0.8 |
| Mobile Home Park | 4.2 | 1.9 | 0.9 | 0.0 |
| Auto Sales/Services | 18.7 | 7.9 | 7.3 | 1.0 |
| Commercial | 6.0 | 10.9 | 5.3 | 0.4 |
| Commercial Services | 3.0 | 8.0 | 3.9 | 0.2 |
| Visitor Accommodations | 2.1 | 3.9 | 1.8 | 0.2 |
| Retail | 16.7 | 8.1 | 1.9 | 0.1 |
| Professional Office | 1.8 | 1.1 | 0.5 | 0.1 |
| Light Industrial | 38.2 | 40.8 | 8.7 | 0.8 |
| Warehouse | 7.7 | 3.3 | 0.4 | 0.0 |
| Public/Institutional | 77.8 | 47.5 | 14.6 | 1.9 |
| Parks/Recreation | 63.7 | 50.6 | 17.8 | 3.0 |
| Transportation, Communication, Utility and Drainage | 17.6 | 10.5 | 6.9 | 2.5 |
| Open Space | 1.1 | 0.5 | 2.6 | 0.4 |
| Wetlands | 23.6 | 1.8 | | |
| Vacant | 383.8 | 252.3 | 101.8 | 15.5 |
| Development Project | 101.5 | 47.2 | 11.3 | 3.9 |
| Total Acres by Contour | 1,819 | 1,069 | 382 | 63 |
| <i>Contour as Percent of Planning Area</i> | <i>15%</i> | <i>9%</i> | <i>3%</i> | <i>1%</i> |

Note: Total acres does not account for acres of right-of-way (all of which, if included, would be allocated to the higher noise contours)

Source: Dyett & Bhatia, 2007.

Figure 3.8-2 Existing Noise Contours

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Noise from Trains along the San Joaquin Valley Railroad

The San Joaquin Valley Railroad provides east-west train services on land owned by Union Pacific Railroad on an average of two trips a day. The trains generally travel with speeds ranging from 10 to 40 miles per hour, depending if they make a stop in Lemoore on that particular trip. The trains currently stop on-demand only, providing service for industrial and agricultural shippers in the City. However, there is a possibility of expanding the service to include passenger rail in the future (for a discussion on this, refer to the Circulation Element). As trains approaches railroad crossings in the City, they blow their horns to signal their arrival. The noise generated by a typical diesel operated train (with horn and without horn), at 10mph with 15 cars is shown in the table below.

Table 3.8-2 Typical Noise Generated by a Train

| Noise Level (dB) | Distance heard without horn (feet) | Distance heard with horn (feet) |
|------------------|------------------------------------|---------------------------------|
| 55 | 113.0 | 821.0 |
| 60 | 35.7 | 259.6 |
| 65 | 11.3 | 82.1 |
| 70 | 3.6 | 26.0 |

Source: Charles Salter Associates, 2007.

Noise from Industrial Zones

There are two industrial zones in Lemoore with the potential to cause noise hazards. The first is located south of Iona Avenue along both sides of 19th Avenue, and the second is located northwest between the San Joaquin Valley Railroad tracks and SR-41. Activities carried out in both of these areas are primarily related to food processing and light manufacturing. At full buildout of the General Plan, more industries are expected to locate in both areas, adding to the number of noise sources.

To minimize noise impacts to surrounding residents, industry uses are usually separated from residential areas by a road or other physical element. The amount of noise present will depend on the type of industrial activity carried out, and is not expected to be as severe as noise from vehicular traffic or aircrafts.

Noise from Lemoore Raceway

The Lemoore Midget Raceway, located at the southwest corner of SR-41 and Idaho Avenue is another source of noise in the City. The raceway operates on most Saturdays from April through October from 3:00 p.m. to midnight. The track is a 1/5+ mile semi-banked oval, with wide corners and straight-aways with a clay racing surface. It accommodates junior sprints, restrictor plate 600s, stock 600s, and 600 modified winged midget racecars. Engines range from 100s motorcycle engines to multi-cylinder 4-cycle engines pulling 619 cc's. Generators are occasionally brought to the site by race crews. During race nights, noise measurements can range from 80 dB to 102 dB when measured 50 feet away from the edge of the track, and up to 81 dB when

measured at 150 feet.¹ Due to the infrequency of races and its location amid industrial properties, this use is not expected to cause noise disturbance to residents.

Aircraft Noise from Lemoore Naval Air Station (NAS Lemoore)

Just to the west of the City is the Naval Air Station Lemoore (NAS Lemoore). One of the principal concerns of airport land use planning is noise compatibility—or minimizing the effects of aircraft noise on communities adjacent to airports. While military air stations are not subject to the same regulatory constraints and guidelines as civilian airports, the Navy is interested in avoiding land use incompatibility around NAS Lemoore and thus has been involved and cooperative in the process of reporting the noise environment associated with their aircraft operations.

Noise modeling was completed by the City noise consultant in February of 2007 in order to determine the likely noise impact of aircraft flying over West Lemoore and inform General Plan policy-making. Aircraft operations at NAS Lemoore are typically F-18 aircraft flying 1,500-feet above ground level in a ‘Radar’ landing pattern near the west side of the City. The predicted noise exposure is related to land use noise compatibility criteria, community response criteria, and sleep interference criteria that are normally used in community land use planning. The projected noise levels are significantly higher than the exterior noise level standards for single family development and multi-family residential development set in the current General Plan. The noise exposure and response results for a 26,000 foot wide cross section beneath the flight tracks over West Lemoore is summarized below:

- DNL or CNEL: 51 dB – 70 dB
- Maximum exterior Single Event Levels (SEL values): 93 dB – 106 dB
- Maximum exterior sound pressure levels: 86 dB – 99 dB
- Predicted percentage of population highly annoyed: 3 - 23
- Predicted percentage of population awakened (ANSI criteria) by each flyover in a well-noise-insulated home: 2 - 4

A follow-up noise monitoring study was completed by the City’s noise consultant in April of 2007 in order to provide “hard” data to compare against the modeling predictions. Noise measurements were taken on location at Liberty School, Lemoore Elementary School, Meadow Lane School and the Lemoore Golf Course. The study found single-event noise levels in locations east of SR-41 to be 10-15 dBA lower than modeling calculations for West Lemoore.

In a June letter the Navy announced the completion of an update to its noise signature from air operations in and around the installation, documenting noise zones expressed as community noise equivalent level (CNEL) values from flight and aircraft maintenance operations. The contours that the Navy has provided to the City depict the effects of aircraft noise at ground level. They are based on current operations with some allowance for modest changes in the quantity of flight operations and variance in the mix of type, series, or models of aircraft assigned to the air station. The contours do not consider the introduction of the Joint Strike Fighter (F-35). The

¹ Readings taken by the City of Lemoore during the races of junior sprint cars, 600 stocks,, and 600 multits on 28 October 2007.

addition of periodic aircraft noise onto baseline levels of street noise might result in generalized contours that are louder than those depicted in the graphics and described in this analysis. These contours are depicted on Figure 3.8-2.

REGULATORY SETTING

Federal, State, and local agencies regulate different aspects of environmental noise.

FEDERAL REGULATIONS

Generally, the federal government sets noise standards for transportation-related noise sources closely linked to interstate commerce. These include aircraft, locomotives, and trucks. The National Environmental Policy Act of 1969 and the Federal-Aid Highway Act of 1970 are examples of federal policies that form the basis for analyzing and abating highway traffic noise. Federal Aviation Regulations, Part 150, address airport noise compatibility planning. They include a system for measuring airport noise impacts and present guidelines for identifying incompatible land uses. All land uses are considered compatible with noise levels of less than DNL 65 dB. At higher noise levels, selected land uses are also deemed acceptable, depending on the nature of the use and the degree of structural noise attenuation provided.

The Department of Defense Air Installations Compatible Use Zones (AICUZ) Program program was established by the Department of Defense in 1973 as an effort to protect the federal government's investment in military airfields. The current noise compatibility criteria (as set forth in the Code of Federal Regulations Title 32, Part 256) are basically the same as those indicated in the FAA's Part 150 program. AICUZ plans prepared for individual airfields are primarily intended as recommendations to local communities regarding the importance of maintaining land uses which are compatible with the noise and safety impacts of military aircraft operations.

STATE REGULATIONS

The State government sets noise standards for transportation noise sources such as automobiles, light trucks, and motorcycles. California counties that include an airport served by a scheduled airline or operated for the benefit of the general public must establish an airport land use commission. (California Public Utilities Code section 21670). The State legislature's purpose in requiring these commissions is to "protect public health, safety, and welfare by ensuring the orderly expansion of airports and the adoption of land use measures that minimize the public's exposure to the extent that these areas are not already devoted to incompatible uses." The commission's chief business is to prepare and enforce a land use plan for the area surrounding each airport in its jurisdiction. This requirement applies regardless of whether a county chooses to establish and maintain an airport land use commission or to utilize the alternative process or county-specific exception provisions of the law. Adoption of compatibility plans for military airports is optional under the Act. Some airport land use commissions (ALUCs) have done this using the Air Installation Compatible Use Zone (AICUZ) studies that are required for each base.

California Airport Noise Regulations promulgated in accordance with the State Aeronautics Act are set forth in Section 5000 et seq. of the California Code of Regulations (Title 21, Division 2.5, Chapter 6). The current version of the regulations became effective in March 1990. In Section

5006, the regulations state that: “The level of noise acceptable to a reasonable person residing in the vicinity of an airport is established as a community noise equivalent level (CNEL) value of 65 dB for purposes of these regulations. This criterion level has been chosen for reasonable persons residing in urban residential areas where houses are of typical California construction and may have windows partially open. It has been selected with reference to speech, sleep and community reaction.”

The California Building Code 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: “Interior noise levels attributable to exterior sources shall not exceed 45 dB in any habitable room. The noise metric shall be either the Day-Night Average Sound Level (Ldn) or the Community Noise Equivalent Level (CNEL), consistent with the noise element of the local general plan. Worst-case noise levels, either existing or future, shall be used as the basis for determining compliance with [these standards]. Future noise levels shall be predicted for a period of at least 10 years from the time of building permit application.”

With regard to airport noise sources, the Building Code goes on to indicate that: “Residential structures to be located where the annual Ldn or CNEL exceeds 60 dB shall require an acoustical analysis showing that the proposed design will achieve the prescribed allowable interior level. For military bases, the Ldn shall be determined from the facility Air Installation Compatible Use Zone (AICUZ) plan. For all other airports or heliports, or public use airports or heliports for which a land use plan has not been developed, the Ldn or CNEL shall be determined from the noise element of the general plan of the local jurisdiction. “When aircraft noise is not the only significant source, noise levels from all sources shall be added to determine the composite site noise level.”

The Government Code requires that a noise element be included as part of local general plans. Airports and heliports are among the noise sources specifically to be analyzed. To the extent practical, both current and future noise contours (expressed in terms of either CNEL or DNL) are to be included. The noise contours are to be “used as a guide for establishing a pattern of land uses...that minimizes the exposure of community residents to excessive noise.”

Finally, noise sources associated with industrial, commercial, and construction activities are generally subject to local control through noise ordinances and General Plan policies.

Under the existing General Plan noise standards, maximum normally acceptable noise exposure is 65dB CNEL for outdoor activity areas in multifamily residential, transient lodging, medical facilities, and church land uses. Playgrounds and neighborhood parks have a maximum normally acceptable noise level of 70 dB CNEL, and schools, libraries, and museums have a maximum normally acceptable exterior noise level of 65 dB CNEL. Theaters, auditoriums and music halls have no normally acceptable range, but only conditionally acceptable noise levels of up to 75dB CNEL. In general, the compatibility criteria in the 1992 General Plan are similar in format to those provided in the proposed General Plan; however, the proposed General Plan refines and adjusts some of the acceptability ranges to remove overlap and ambiguity.

IMPACT ANALYSIS

SIGNIFICANCE CRITERIA

Implementation of the proposed General Plan would have a potentially significant impact if it would:

- Cause exterior noise exposure in the “Conditionally Acceptable” (between 60 dB and 70 dB) or “Normally Unacceptable” (between 70 dB and 75 dB) ranges;
- Cause interior noise levels in habitable rooms in multi-family dwellings to exceed 45 dB³;
- Expose persons to or generation of construction-related groundborne vibration or groundborne noise levels; or
- Expose persons to noise in excess of 65 dB generated by aircraft originating from or destined for the Lemoore Naval Air Station facility.

METHODOLOGY AND ASSUMPTIONS

Street noise exposure contours for Lemoore were modeled by Charles Salter Associates by applying the Federal Highway Administration’s noise modeling procedure. The major variables in a noise contour analysis are total traffic volumes, percentages of truck traffic, and average traffic speeds on each road segment. These noise contours are conservative, meaning that the contours are modeled with minimal noise attenuation by natural barriers, buildings, etc. The noise level measured at a specific location may be lower than what is shown on the noise contour map.

SUMMARY OF IMPACTS

Implementation of the proposed General Plan will result in higher traffic volumes, more industrial and commercial noise sources, and a larger population, all of which will contribute to the noise environment in Lemoore in 2030. In addition to noise generated in Lemoore itself, this Plan anticipates on-going and perhaps increased noise generated by NAS Lemoore, and increased exposure to NAS Lemoore noise through development in West Lemoore. The General Plan anticipates these trends and presents a set of policies on traffic, stationary source, and aircraft noise and supplies policies to actively and efficiently combat these changes to the noise environment. Future noise impact related to traffic, construction, and stationary sources are likely to be less than significant. However, unlike civilian aircraft that tend to get quieter with improvements in technology, military aircraft tend to get louder with improvements. This poses a particular challenge for future development in West Lemoore, as much of that land lies within the 60-74 dB contours of the air station. The future impacts related to NAS Lemoore noise are significant and unavoidable, although the proposed Plan policies do mitigate potential impacts to some extent. Future Noise Contours, including 2007 NAS Lemoore contours, are provided in **Figure 3.8-3**. NAS Lemoore contours may be expected to increase in the future when the Navy updates its Encroachment Plan for NAS Lemoore.

² State of California General Plan Guidelines, Governors Office of Planning and Research, 2003.

³ California Building Code, Division II—Sound Transmission Control, Annex Chapter 12, 1208A.8.3 Airport Noise Sources, 1998.

IMPACTS AND MITIGATION MEASURES

Impact

- 3.8-1 New development under the proposed General Plan would cause exterior traffic noise exposure in the “Conditionally Acceptable” (between 60 dB and 70 dB) or “Normally Unacceptable” (between 70 dB and 75 dB) ranges; or cause interior noise levels in habitable rooms in multi-family dwellings to exceed 45 dB due to traffic noise. (*Less than Significant*)

New development under the proposed General Plan will result in population and employment increases and more automobile and truck use. This will contribute to raising traffic-related noise levels and exposure. Table 3.8-3 shows how planned land uses would be affected by traffic noise at buildout in 2030. Of the total amount of land that will be exposed to traffic noise above the 65 dB CNEL level (283 acres), approximately 108 acres or 38 percent of the total, would be in residential use and subject to requirements for noise mitigation and sound attenuation to ensure that interior noise levels are reduced.

Figure 3.8-3 depicts the future noise contours for Lemoore, including aircraft noise from NAS Lemoore over-flights. The proposed General Plan provides a number of rigorous policies to control noise impacts, through physical barriers, landscaping, and land use compatibility standards. Use of these noise attenuation measures (examples include increased screening, sound-proofing and double-glazed windows) will help buffer or mask increases in ambient noise, thereby reducing potential impacts to levels that are less than significant.

Proposed General Plan Policies that Reduce the Impact

The following policies would reduce potential noise impact to a level that is less than significant:

- SN-I-31 Enact a Noise Control Ordinance with specific noise measurement standards, required noise insulation standards for new residential development exposed to aircraft noise and other noise sources, and enforcement procedures.

The new ordinance will be enacted in the Zoning section of the Municipal Code, and will complement the existing Noise Ordinance in the Public Safety section. It will be generally oriented toward limiting the generation of noise emissions, but may also include provisions for mandatory mitigation actions.

- SN-I-32 Use the community noise compatibility standards, shown in Table 3.8-4 as review criteria for new land uses.

These standards show noise levels that are “normally acceptable”, “conditionally acceptable”, “normally unacceptable”, and “clearly unacceptable” for different types of land use. Indoor noise level reductions (NLR) exceeding minimum standards for NLR in the Navy’s AICUZ instructions will be required for any new residential development in areas where the CNEL will exceed 65 dBA; see Policy SB-I-35. SN-I-36, SN-I-37 and SN-I-38.

Figure 3.8-3: Future Noise Contours

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Table 3.8-3 Future Land Use Exposure to Traffic Noise (acres)

| <i>General Plan Land Use Designation</i> | <i>51-55 dB</i> | <i>56-60 dB</i> | <i>61-65 dB</i> | <i>66-70 dB</i> |
|--|-----------------|-----------------|-----------------|-----------------|
| Agriculture | 495.7 | 305.7 | 148.7 | 63.9 |
| Agriculture/Rural Residential | 18.0 | 5.1 | 2.3 | 0.6 |
| Very Low Density Residential | 153.6 | 98.2 | 45.0 | 17.7 |
| Low Density Single Family Residential | 543.0 | 549.5 | 184.7 | 52.7 |
| Low Medium Density Residential | 123.2 | 118.1 | 49.1 | 20.7 |
| Medium Density Multi-Family Residential | 37.5 | 52.5 | 23.4 | 8.7 |
| High Density Residential | 16.0 | 13.2 | 3.2 | 0.3 |
| Regional Commercial | 11.0 | 41.6 | 44.6 | 13.6 |
| Commercial | 8.8 | 34.7 | 17.0 | 3.9 |
| Neighborhood Commercial | 25.8 | 36.7 | 22.5 | 4.6 |
| Professional Office | 23.6 | 44.1 | 17.9 | 3.2 |
| Mixed-Use | 29.0 | 55.4 | 23.4 | 8.7 |
| Business Park | 6.7 | 1.0 | | |
| Industrial | 244.9 | 186.5 | 70.5 | 18.4 |
| Heavy Industrial | 16.4 | 7.0 | 0.7 | 0.1 |
| Public/Institutional | 131.9 | 75.3 | 32.9 | 8.0 |
| Parks/Recreation | 60.3 | 97.5 | 38.7 | 8.3 |
| Employment Reserve Area | 141.1 | 161.3 | 58.6 | 13.3 |
| Greenway/Detention Basin | 28.0 | 22.4 | 31.2 | 36.5 |
| Wetlands | 84.6 | 20.6 | 0.4 | |
| Total Acres by Contour | 2,199 | 1,926 | 815 | 283 |
| Contour as Percent of Planning Area | 18% | 16% | 7% | 2% |
| <i>Percent Change from Existing Conditions</i> | 3% | 7% | 4% | 2% |

Note: Total acres does not account for acres of right-of-way (all of which, if included, would be allocated to the higher noise contours)

Source: Dyett & Bhatia, 2007.

SN-I-33 Consider an increase of five or more dBA to be “significant” if the resulting noise level would exceed that described as “normally acceptable” in Table 3.8-4.

SN-I-34 Apply performance-based noise standards within zoning classifications likely to encompass sensitive land uses.

Performance-based standards have the benefit of flexibility in that they do not attempt to regulate precisely what uses may locate in the particular zone, but rather what sort of noise environment those uses produce. Performance-based standards can work well with community noise compatibility criteria such as those listed in Table 3.8-4.

SN-I-35 Require that all new residential development achieve noise level reductions to meet the land use compatibility standards through acoustical design and construction of the building elements:

- Residential building designs must be based upon a minimum interior design noise level reduction of 40 dB in all habitable areas (i.e., garages, storage areas, etc. are excepted). The 40 dB criteria must provide a minimum constructed noise level reduction of 35 dB; and
- Residential building designs must also be based upon a minimum design noise level reduction of 45 dB in all bedrooms. The 45 dB criteria must provide a minimum constructed noise level reduction of 40 dB.



SN-I-36 Establish standards for the basic elements of noise reduction design for new dwellings exposed to DNL above 65 dB (anticipated for areas west of SR-41), including the following:

- All facades must be constructed with substantial weight and insulation;
- Sound-rated windows providing noise reduction performance similar to that of the façade must be included for habitable rooms;
- Sound-rated doors or storm doors providing noise reduction performance similar to that of the façade must be included for all exterior entries;
- Acoustic baffling of vents is required for chimneys, fans and gable ends;
- Installation of a mechanical ventilation system affording comfort under closed-window conditions is required; and
- To meet the highest noise level reduction requirements it will likely be necessary to use double-stud construction, double doors, and heavy roofs with ceilings of two layers of gypsum board on resilient channels.

Alternative acoustical designs that achieve the prescribed noise level reduction in Policy SN-I-35 may be approved if a Board Certified Acoustical Engineer submits information demonstrating that the required reductions can be achieved and maintained.

Table 3.8-4 Land Use Compatibility For Community Noise Environments

| Land Use Category | Community Noise Exposure, L_{dn} or CNEL, dB | | | | | | |
|--|--|---------------------|--------------------------|--------------------------|-----------------------|----------------------|----------------------|
| | 55 | 60 | 65 | 70 | 75 | 80 | 85 |
| Residential – Low Density Single Family | Normally Acceptable | Normally Acceptable | Conditionally Acceptable | Conditionally Acceptable | Normally Unacceptable | Clearly Unacceptable | Clearly Unacceptable |
| Residential – Multi Family | Normally Acceptable | Normally Acceptable | Conditionally Acceptable | Conditionally Acceptable | Normally Unacceptable | Clearly Unacceptable | Clearly Unacceptable |
| Mixed-Use and High Density Residential | Normally Acceptable | Normally Acceptable | Conditionally Acceptable | Conditionally Acceptable | Normally Unacceptable | Clearly Unacceptable | Clearly Unacceptable |
| Transient Lodging – Motels, Hotels | Normally Acceptable | Normally Acceptable | Conditionally Acceptable | Conditionally Acceptable | Normally Unacceptable | Clearly Unacceptable | Clearly Unacceptable |
| Schools, Libraries, Churches, Hospitals, Nursing Homes | Normally Acceptable | Normally Acceptable | Conditionally Acceptable | Conditionally Acceptable | Normally Unacceptable | Clearly Unacceptable | Clearly Unacceptable |
| Auditoriums, Concerts, Halls, Amphitheaters | Normally Acceptable | Normally Acceptable | Conditionally Acceptable | Conditionally Acceptable | Normally Unacceptable | Clearly Unacceptable | Clearly Unacceptable |
| Sports Area, Outdoor Spectator Sports | Normally Acceptable | Normally Acceptable | Conditionally Acceptable | Conditionally Acceptable | Normally Unacceptable | Clearly Unacceptable | Clearly Unacceptable |
| Playgrounds, Neighborhood Parks | Normally Acceptable | Normally Acceptable | Conditionally Acceptable | Conditionally Acceptable | Normally Unacceptable | Clearly Unacceptable | Clearly Unacceptable |
| Golf Courses, Riding Stables, Water Recreation, Cemeteries | Normally Acceptable | Normally Acceptable | Conditionally Acceptable | Conditionally Acceptable | Normally Unacceptable | Clearly Unacceptable | Clearly Unacceptable |
| Office Buildings, Businesses Commercial and Professional | Normally Acceptable | Normally Acceptable | Conditionally Acceptable | Conditionally Acceptable | Normally Unacceptable | Clearly Unacceptable | Clearly Unacceptable |
| Industrial, Manufacturing Utilities, Agriculture | Normally Acceptable | Normally Acceptable | Conditionally Acceptable | Conditionally Acceptable | Normally Unacceptable | Clearly Unacceptable | Clearly Unacceptable |

| | | |
|---|--------------------------|---|
|  | Normally Acceptable | Specified land use is satisfactory, based upon the assumption that any building involved is of normal conventional construction, without any special noise insulation requirements. |
|  | Conditionally Acceptable | New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice. |
|  | Normally Unacceptable | New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design. |
|  | Clearly Unacceptable | New construction or development should not be undertaken. |

Source: City of Lemoore, 2007.

- SN-I-37 Prohibit construction materials and methods that do not provide enough noise insulation to ensure compliance with compatibility standards, including:
- Pre-manufactured housing and mobile homes built with framing less than 2 x 4 inches;
 - Facades using aluminum, vinyl or other exterior siding weighing less than 5 psf;
 - Façade construction without insulation;
 - Flat roofs without an interstitial cavity space or with a space less than 10 inches (i.e., no monolithic T&G roof/ceiling systems);
 - Jalousie or other lightweight or poor-sealing window systems; and
 - Packaged terminal air-conditioning (PTAC) units (i.e., through-the-wall air-conditioning).
- SN-I-38 Require that all residential building designs for sites where the CNEL will exceed 65dBA include supporting information for City review and approval demonstrating that an acoustical design providing the necessary noise level reduction has been prepared by a Board Certified Acoustical Engineer for each dwelling unit prior to construction. Elements of this acoustical review process shall include:
- A letter by a Board Certified Engineer approving the acoustical design of each dwelling unit (or group of units, if identical), submitted to the Lemoore Building Department with building permit applications. This letter must be received and approved prior to the issuance of a building permit;
 - Following construction, a letter by the Board Certified Engineer showing noise level reduction test results for a minimum of two habitable areas within each dwelling unit (or group of units, if identical), submitted to the Lemoore Building Department for review and approval prior to the issuance of an occupancy permit.
- The City will establish noise monitoring procedures and review criteria in the Zoning Ordinance. General review and approval of groups of buildings or prototype designs may be sufficient to meet these requirements. All acoustical engineering and measurement must be conducted under the direction of an Acoustical Engineer who is currently Board Certified by the Institute of Noise Control Engineering, USA.*
- SN-I-39 Develop uniform guidelines for acoustical studies based on current professional standards in the Noise Control Ordinance.
- Uniform guidelines for the preparation of noise studies will help applicants understand City requirements for adequate acoustical evaluations.*
- SN-I-40 Require developers to mitigate the noise impacts of new development on adjacent properties as a condition of permit approval through appropriate means, including, but not limited to:

- Screen and control noise sources, such as parking and loading facilities, outdoor activities, and mechanical equipment;
- Increase setbacks for noise sources from adjacent dwellings;
- Retain fences, walls, and landscaping that serve as noise buffers;
- Use soundproofing materials and double-glazed windows;
- Use open space, building orientation and design, landscaping and running water to mask sounds;
- Control hours of operation, including deliveries and trash pickup, to minimize noise impacts; and
- As a last resort, construct noise walls along highways and arterials when compatible with aesthetic concerns and neighborhood character. This would be a developer responsibility.

Proposed development may introduce new potential noise sources even where, from a zoning perspective, it is compatible with existing adjacent uses. An example is the handling of large trash bins for multi-family housing. Site design and/or screening techniques can help mitigate the resulting noise. Within urban residential neighborhoods where medium and high density residential development and mixed use development is planned, the City will balance the need for noise mitigation with urban design considerations. The construction of sound walls will be considered where reducing noise to acceptable levels by other means is not feasible.

SN-I-41 Promote the use of noise attenuation measures to improve the acoustic environment inside residences where existing single-family residential development is located on an arterial street.

These measures may include those listed under policy SN-I-37.

SN-I-42 Establish criteria for evaluating applications from residents for exceptions to residential noise level requirements for the operation of standby electrical equipment used to meet medical needs.

This assumes that equipment noise will be mitigated to reduce the noise level at the property line to the 60 decibel level requirement.

As noted, implementation of the above policies will mitigate noise impacts from implementation of the proposed General Plan to a level that is less than significant. No additional mitigation is needed.

Impact

3.8-2 Implementation of the proposed General Plan would potentially expose existing noise-sensitive uses to construction-related noise consisting of groundborne vibration and ambient noise. (*Less than Significant*)

The proposed General Plan provides for new development around the City and infill development within the existing City. Groundborne vibration may be produced by large trucks entering and exiting construction sites, earth movements, drilling, and other construction-related activities. Ambient noise levels near areas of new development may temporarily increase. Proposed General Plan policies require insulation in the form of soundproof materials, fences, walls, and landscaping that serve as noise buffers. Also, individual development projects will be subject to site-specific environmental review, which will necessitate identification of site-level mitigation if significant noise impacts are identified.

Proposed General Plan Policies that Reduce the Impact

The following policies would reduce potential construction-related noise impact to a level that is less than significant:

- SN-I-43 Require new noise sources to use best available control technology (BACT) to minimize noise emissions.

- SN-I-44 Require noise from permanent mechanical equipment to be reduced by sound-proofing materials and sound-deadening installation.

- SN-I-45 Minimize vehicular and stationary noise sources and noise emanating from temporary activities, such as those arising from construction work.

In addition to these policies, policies summarized under Impact 3.8-1 will also help to reduce this impact and thus are incorporated here by reference. Implementation of all of these policies will reduce this impact to a level that is less than significant. No additional mitigation is needed.

Impact

3.8-3 Implementation of the proposed General Plan would expose about 7,000 persons to noise in excess of 65 dB generated by aircraft originating from or destined for the Lemoore Naval Air Station facility. (*Significant and Unavoidable*)

According to the proposed General Plan land use compatibility standards for community noise environments, additional development in West Lemoore would be subject to aircraft noise that would be in the “conditionally acceptable” and “normally unacceptable” ranges of noise exposure for residential development and sensitive land uses. Noise mitigation policies are included within the proposed General Plan, but due to development restrictions in other directions (namely north and east) as well as existing entitlements for development to the west, the proposed General Plan provides for new development in West Lemoore, subject to standards for Noise Level Reductions (NLRs) that exceed the NLR criteria in the Navy’s instructions for AICUZ studies by 10 to 15 dB

(See Policy SN-I-35). The Navy’s Air Installations Compatible Use Zones (AICUZ) land use compatibility guidelines for aircraft noise zones state that residential uses are not compatible and should be “discouraged in areas of DNL or CNEL noise exposure in DNL 65-69 and strongly discouraged in DNL 70-74”⁴ and go on to state that: “The absence of viable alternative development options should be determined and an evaluation should be conducted locally prior to local approvals indicating that a demonstrated community need for the residential use would not be met if development were prohibited in these Zones. Where the community determines that these uses must be allowed, measures to achieve an outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB in DNL 65-69 and NLR of 30 dB in DNL 70-74 should be incorporated into building codes and be in individual approvals”. Policy SN-I-35 requires NLRs of 40 dB for habitable rooms and 45 dB for bedrooms. Table 3.8-5 below summarizes acres of urban land exposed to NAS Lemoore noise contours. The calculation of the number of persons is based on the density assumptions and average household sizes assumed for Plan buildout. This analysis does not quantify the potential impact of possible Joint Strike Fighters based at NAS Lemoore.

Table 3.8-5 Proposed General Plan Land Use Exposure to NAS Lemoore Noise (acres)

| | 60 to 64 dB | 65 to 74 dB | Total |
|---|--------------|--------------|--------------|
| Agriculture | 1,199 | 714 | 1,913 |
| Very Low Density Residential | 52 | 0 | 52 |
| Low Density Single Family Residential | 152 | 256 | 408 |
| Low Medium Density Residential | 53 | 158 | 212 |
| Medium Density Multi-Family Residential | 5 | 16 | 21 |
| Commercial | 65 | 87 | 151 |
| Neighborhood Commercial | 11 | 0 | 11 |
| Professional Office | 27 | | 27 |
| Mixed-Use | | 30 | 30 |
| Business Park | 59 | | 59 |
| Industrial | 460 | 230 | 690 |
| Public/Institutional | 12 | 177 | 188 |
| Parks/Recreation | 50 | 47 | 97 |
| Greenway/Detention Basin | 34 | 32 | 66 |
| Wetlands | 54 | 10 | 64 |
| Total | 2,232 | 1,758 | 3,990 |
| <i>Each Contour as Percent of Total Land in Planning Area</i> | <i>18</i> | <i>14</i> | <i>33</i> |

Source: Dyett & Bhatia, 2007.

⁴ Pg. 20, OPNAC Instruction 11010.36B, AICUZ Program Procedures and Guidelines, Department of the Navy Office of the Chief of Naval Operations, December 19, 2002.

Proposed General Plan Policies that Reduce the Impact

The following policies would reduce this potential noise impact:

LU-I-4 Work with the County on a Memorandum of Understanding (MOU) in which the County will commit to:

- Retaining agriculture and open space areas around the City, consistent with the General Plan; and
- Notifying the City of development applications within the “secondary” SOI adjacent to the City’s Planning Area for comment to avoid potential conflicts.

Joint planning agreements have been used successfully in many jurisdictions. This policy is intended to create a mechanism to protect the open space, agriculture, wetlands, and open canals that form the backdrop for the City, so that the City can keep a distinct urban edge. The City will also notify NAS Lemoore of development applications on the west side of the Planning Area in order to maintain the open space buffer between the City and the air station land use.

SN-I-46 Require a noise study and mitigation measures for all new projects that have aircraft noise exposure greater than “normally acceptable” levels. Mitigation measures may include noise insulation, noise disclosure, buyer beware programs, or avigation easements, as shown in Table 3.8-6.

Table 3.8-6 Aircraft Noise Mitigation Measures

| <i>Mitigation Approach</i> | <i>Impact Reduction</i> |
|--|---|
| Noise Insulation Develop and enforce noise insulation standards for new residential construction in aircraft noise-impacted areas. | Insulation improves the indoor noise environment over that of conventionally constructed homes. It is most effective on higher frequency sounds and typically allows for uninterrupted speech, TV listening, etc. during flyovers. |
| Noise Disclosure Disclose the noise environment to prospective homebuyers. This is typically done on a lengthy checklist of issues where each item may be designated as a problem, not a problem or unknown. | All potentially adverse aspects of a property, including noise, must be disclosed to prospective buyers. |
| Buyer Beware Program Maintain a ‘buyer beware’ program for future noise complainers, requiring all home buyers to sign a noise acknowledgement and “hold harmless” agreement when buying a home in an aircraft noise-impacted area. | This measure is designed to avoid conflict by facilitating better consumer decision-making. |
| Avigation Easement Require residential developers to grant an ‘avigation noise easement’ to the City of Lemoore or Kings County at the time of subdivision or parcel map recording. The FAA typically requires avigation easements for homeowners receiving noise insulation treatment. | The avigation easement is a legal document granting the right to fly over homes and holding the air station harmless from the noise consequences of all aircraft activity; it is transferred unconditionally at the time of sale to the new homeowners. |

Source: Charles Salter Associates, 2007.

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- SN-I-47 Coordinate with NAS Lemoore to incorporate their Air Installation Compatible Use Zone (AICUZ) study into future updates to the City Zoning Ordinance and General Plan to the extent consistent with the City's compatibility standards and noise level reduction requirements.
- SN-I-48 Minimize noise impacts of NAS Lemoore flight operations on noise-sensitive development.

NAS Lemoore is a valued element of the Lemoore community. The City will work with NAS Lemoore to identify existing sensitive receptors and develop strategies for implementing noise mitigation measures such as those suggested for new development in Table 3.8-6.

In addition to these policies, policies under Impact 3.8-1 will also help to reduce this impact and thus are incorporated here by reference. Implementation of the policies summarized above will help to reduce this impact, however, it is anticipated that the noise environment may still be an area of conflict between the City and NAS Lemoore as a result of continued development in West Lemoore, and therefore the policies in this Plan are not considered completely sufficient to eliminate this impact or mitigate it below significance. No additional mitigation measures are feasible.

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