

9

Noise

The purpose of the Noise Element is to identify the noise sources that exist within the City, and to establish policies and programs to mitigate their potential impacts through both preventative and responsive measures. The regulation of noise sources such as traffic, railroad operations and aircraft operations is overseen by State and federal agencies; therefore, this element has a direct correlation with the land use, circulation, and housing elements. It guides the location of industrial land uses and transportation facilities, since they are common sources of excessive noise levels. This element also guides the location of particularly noise-sensitive uses, such as residences, schools, churches, and hospitals, so that they may be less affected by noise.

9.1 NOISE CHARACTERISTICS & MEASUREMENT

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.

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

- *Level* (e.g., magnitude or loudness). Sound levels are measured and expressed in decibels (dB) with 10 dB roughly equal to the threshold of hearing. Figure 9-1 shows the decibel levels associated with different common sounds. Transient noise events may be described by their maximum A-weighted noise level (dBA).
- *Frequency* composition or spectrum. 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 divide the audible human frequency range (e.g., from 20 to 20,000 Hz) into 10 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 having no identifiable source. Identifiable events of brief duration, such as aircraft flyovers, cause the community noise level to vary from instant to instant. A single number called the equivalent sound level or Leq describes the average noise exposure level over a period of time. Hourly Leq values are called Hourly Noise Levels.

Figure 9-1: Typical Sound Levels

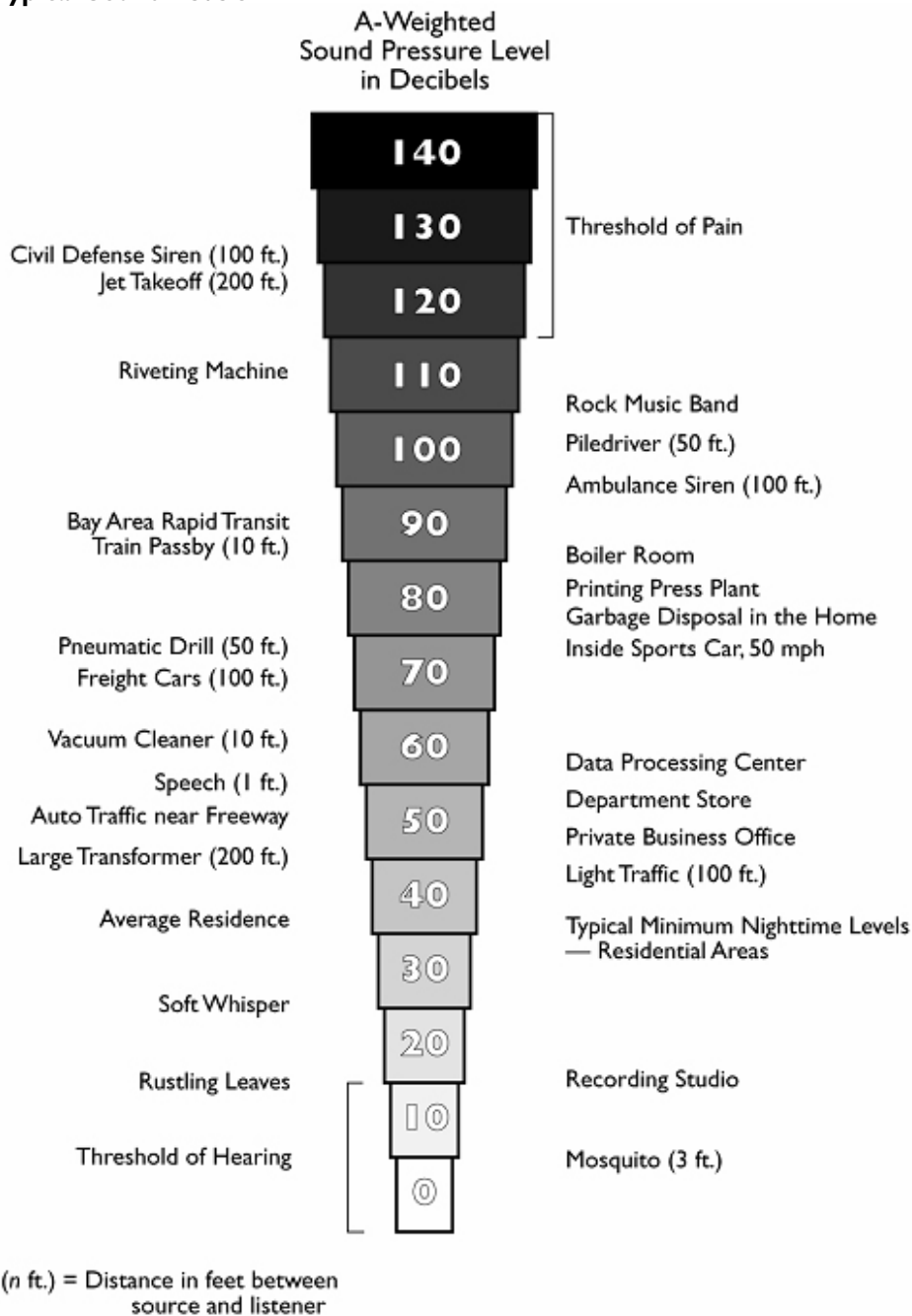


Figure 9-2
Existing Noise Contours

- 55 dB CNEL
- 60 dB CNEL
- Planning Area
- City Limits

Source: CSA, 2007, Airport Master Plan

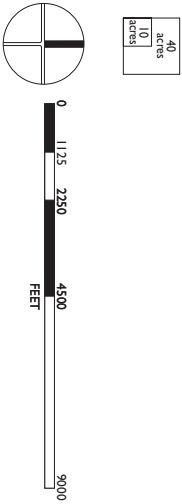
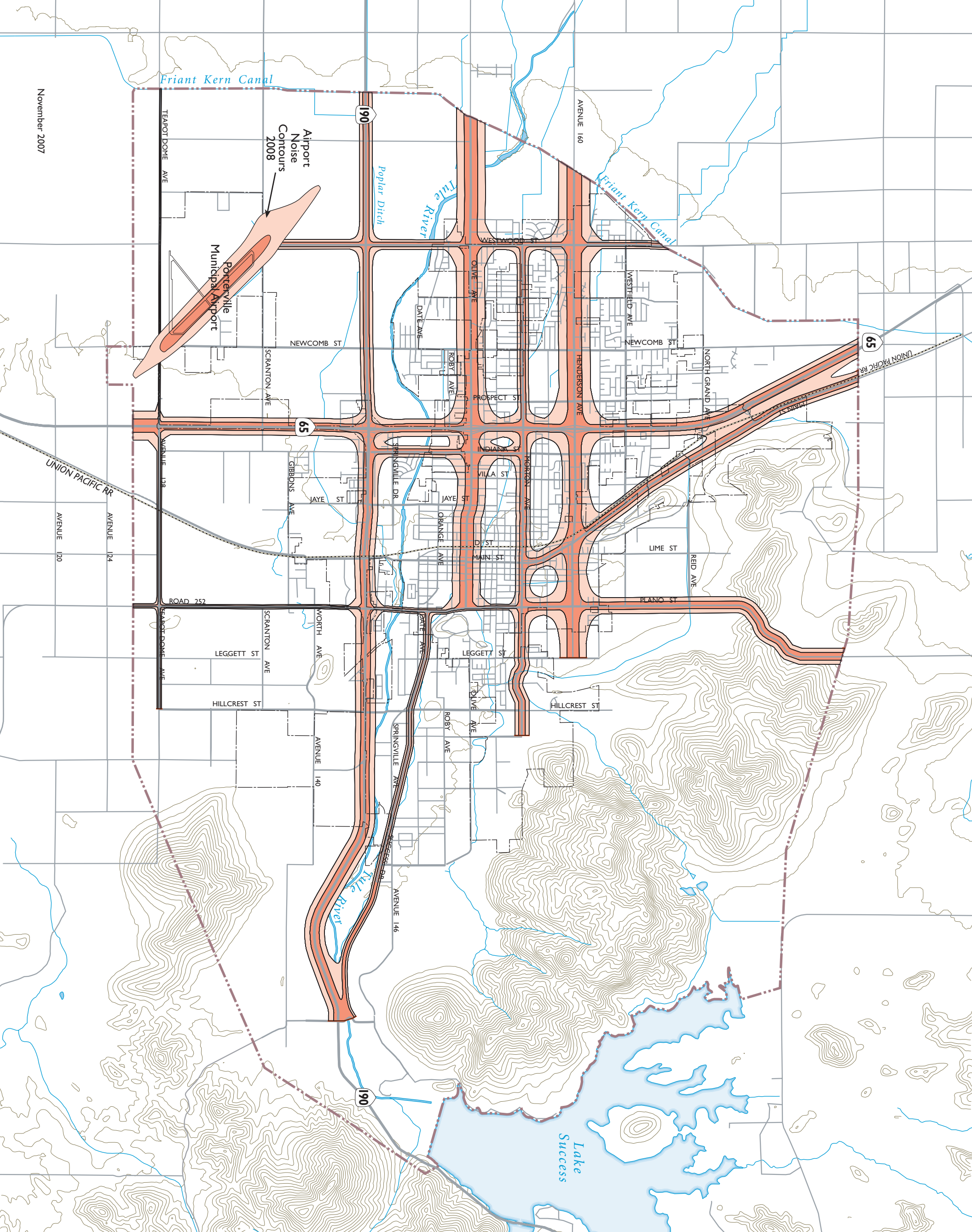
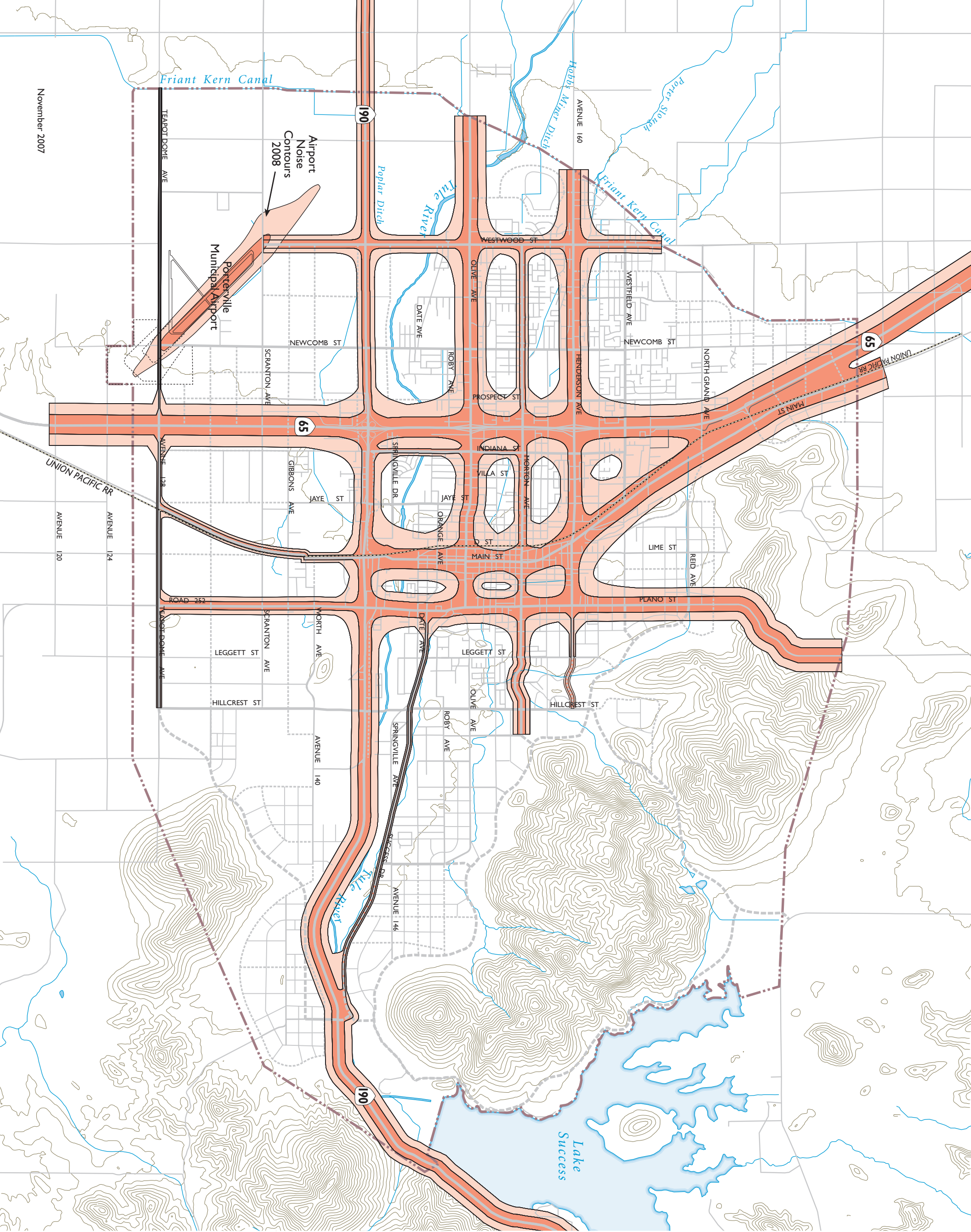


Figure 9-3
Projected Noise Contours, 2030

- 55 dB CNEL
- 60 dB CNEL
- Planning Area

Source: CSA, 2007, Airport Master Plan



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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 factor in human sensitivity to nighttime noise when 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 (L_{dn}). 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 Element under State planning law.

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.

9.2 NOISE GENERATION IN PORTERVILLE

The major noise sources in Porterville are related to roadways and vehicle traffic. Other noise sources include aircraft and rail transportation. Noise produced by industry has a negligible effect on the City's residential noise environment. Figure 9-2 maps existing noise contours.

According to common practice, maximum noise levels of 60 dB are considered "normally acceptable" for unshielded residential development. Noise levels from 60 dB to 70 dB fall within the "conditionally unacceptable" range, and those in the 70 to 75 dB range are considered "normally unacceptable."



The General Plan will improve streetscape character while continuing to reduce traffic noise levels in residential neighborhoods.

TRAFFIC NOISE

The level of highway traffic noise depends on three factors: (1) the volume of the traffic, (2) the speed of the traffic, and (3) the number of trucks in the flow of traffic. Vehicle noise is a combination of the noises produced by the engine, exhaust, tires, and wind generated by taller vehicles. Other factors that affect the perception of traffic noise include: distance from the highway, terrain, vegetation, and natural and structural obstacles. While tire noise from autos is generally located at ground level, truck noise sources can be located as high as 10 to 15 feet above the roadbed due to tall exhaust stacks and higher engines.

Noise exposure contours for Porterville's major roadways were modeled by applying the Federal Highway Administration's noise modeling procedure. 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.

The existing noise conditions for the roadways were measured at 10 locations for 10 minutes between August 16 and 17, 2005. Three of these locations were monitored for 24 hours. In 2005, about 1,800 acres (5 percent) of the Planning Area were in areas with noise levels greater than 60 dB. Approximately 16 percent of single-family housing and 23 percent of multi-family housing is in areas with noise levels greater than 55 dB.

Future development within the City's Planning Area will result in increased traffic volumes, thus increasing noise levels somewhat in some areas. Future noise contours are illustrated in Figure 9-3. In 2030, approximately 3,600 acres (10 percent) will be within areas with noises levels greater than 60 dB. Approximately 11 percent of the single-family housing 45 percent of the multi-family housing, and 16 percent of the educational uses will be within the 60 dB contours. Approximately 15 percent of the single-family residential, 40 percent of the multi-family residential, and 23 percent of the educational uses will be within the 55 dB contours. Increases in traffic levels can be counteracted by the implementation of alternate forms of transportation and land use design that factor in noise concerns. Locating noise-sensitive uses away from high-noise areas (e.g., major transportation routes) and buffering noise levels through design and landscaping features will help minimize future noise-related land use conflicts. Policies in this element establish review criteria for certain land uses to ensure that future noise levels will not exceed acceptable levels near noise-sensitive land uses.

PORTERVILLE MUNICIPAL AIRPORT NOISE

The City recognizes the importance of Porterville Municipal Airport to the community and region. The Tulare County Airport Land Use Commission (ALUC), the agency that has jurisdictional authority over the airport, assesses adjacent land use. The Tulare County Comprehensive Airport Land Use Plan (CALUP) guides the ALUC in determining appropriate compatible land uses with detailed findings and policies. This includes minimizing the effects of aircraft noise on communities adjacent to airports. In 2003, the Porterville Municipal Airport hosted approximately 51,200 total aircraft operations (140 flights per day).

By 2025, the 2006 *Airport Layout Plan* estimates the Porterville Municipal Airport will host approximately 93,900 total aircraft operations (257 flights per day). Currently the ALUC is working to update the Tulare County CALUP, which will include updated noise contours for the airport's proposed expansion.

RAILROAD OPERATIONS NOISE

At this time, no trains are operating on the rail right-of-way within Porterville. If the San Joaquin Valley Railroad service were to resume, one low-speed train would travel to and from Porterville twice weekly. No information is available on potential cumulative noise exposure, although the train could have significant short-term impacts near grade crossings.

Table 9-1: Land Use Compatibility For Community Noise Environments

Land Use Category	Community Noise Exposure						
	Ldn or CNEL, dB						
	55	60	65	70	75	80	>80
Residential – Low Density Single Family, Duplex, Mobile Homes							
Residential – Multi Family							
Mixed-Use & High Density Residential							
Transient Lodging – Motels, Hotels							
Schools, Libraries, Churches, Hospitals, Nursing Homes							
Auditoriums, Concerts, Halls, Amphitheaters							
Sports Area, Outdoor Spectator Sports							
Playgrounds, Neighborhood Parks							
Golf Courses, Riding Stables, Water Recreation, Cemeteries							
Office Buildings, Businesses Commercial and Professional							
Industrial, Manufacturing Utilities, Agriculture							
Interpretation:  Normally Acceptable  Conditionally Acceptable  Normally Unacceptable  Clearly Unacceptable Specified land use is satisfactory, based upon the assumption that any building involved is of normal conventional construction, without any special noise insulation requirements. 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. 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. New construction or development should not be undertaken.							

Source: City of Porterville, 2006.

GUIDING POLICIES

- N-G-1 *Minimize vehicular and stationary noise levels and noise from temporary activities.*
- N-G-2 *Ensure that new development is compatible with the noise environment.*

IMPLEMENTATION POLICIES

- N-I-1 Use the community noise exposure level standards, shown in Table 9-1, as review criteria for new land uses and require a noise study and mitigation measures for all projects that have noise exposure greater than “normally acceptable” levels.

These measures will include, but are not limited to, the following actions:

- *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; and*
- *Control hours of operation, including deliveries and trash pickup, to minimize noise impacts.*

The need for mitigation of exterior noise exposure for other development will be evaluated on a case-by-case basis. 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, and may not require exterior walls along streets where an attractive pedestrian-oriented environment with porches and front stoops is desired.

- N-I-2 Require that all new residential development achieve interior noise level reductions through sound insulation and other measures to meet the land use compatibility standards by acoustical design and construction of the structure and building elements.

- N-I-3 Establish standards for the basic elements of noise reduction design for a new dwelling unit exposed to DNL above 65 dB, including the following:
- All façades 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; and
 - Installation of a mechanical ventilation system affording comfort under closed window conditions is required.
- Alternative acoustical designs that achieve the prescribed noise level reduction in Policy N-I-3 may be approved if a Board-Certified Acoustical Engineer submits information demonstrating that the required reductions can be achieved and maintained.*
- N-I-4 Require sound walls or other attenuation measures designed to reduce noise by a minimum of 10 dB in residential areas adjacent to State highways when additional lanes are added or when new residential development or sensitive receptors would be exposed to noise above 65 dB.
- N-I-5 Reduce noise intrusion generated by miscellaneous noise sources through conditions of approval to control noise-generating activities.
- N-I-6 Require new noise sources to use best available control technology (BACT) to minimize noise emissions.
- N-I-7 Require noise from existing mechanical equipment to be reduced by soundproofing materials and sound-deadening installation.
- N-I-8 Work with the Tulare County Airport Land Use Commission (ALUC) to prepare an Airport Land Use Compatibility Plan and updated airport noise contours, consistent with the new airport layout plan.
- N-I-9 Require the disclosure of the noise environment to prospective homebuyers where noise levels exceed “normally acceptable” standards.

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