Appendix H Noise Analysis

Appendix

This page intentionally left blank.

Fundamentals of Noise

NOISE

Noise is most often defined as unwanted sound; whether it is loud, unpleasant, unexpected, or otherwise undesirable. Although sound can be easily measured, the perception of noise and the physical response to sound complicate the analysis of its impact on people. People judge the relative magnitude of sound sensation in subjective terms such as "noisiness" or "loudness."

Noise Descriptors

The following are brief definitions of terminology used in this chapter:

- **Sound.** A disturbance created by a vibrating object, which, when transmitted by pressure waves through a medium such as air, is capable of being detected by a receiving mechanism, such as the human ear or a microphone.

- **Noise.** Sound that is loud, unpleasant, unexpected, or otherwise undesirable.

- **Decibel (dB).** A unitless measure of sound, expressed on a logarithmic scale and with respect to a defined reference sound pressure. The standard reference pressure is 20 micropascals (20 μPa).

- **Vibration Decibel (VdB).** A unitless measure of vibration, expressed on a logarithmic scale and with respect to a defined reference vibration velocity. In the U.S., the standard reference velocity is 1 micro-inch per second ($1x10^{-6}$ in/sec).

- **A-Weighted Decibel (dBA).** An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.

- **Equivalent Continuous Noise Level (L_{eq}); also called the Energy-Equivalent Noise Level.** The value of an equivalent, steady sound level which, in a stated time period (often over an hour) and at a stated location, has the same A-weighted sound energy as the time-varying sound. Thus, the L_{eq} metric is a single numerical value that represents the equivalent amount of variable sound energy received by a receptor over the specified duration.

- **Statistical Sound Level (L_n).** The sound level that is exceeded "n" percent of time during a given sample period. For example, the L_{50} level is the statistical indicator of the time-varying noise signal that is exceeded 50 percent of the time (during each sampling period); that is, half of the sampling time, the changing noise levels are above this value and half of the time they are below it. This is called the "median sound level." The L_{10} level, likewise, is the value that is exceeded 10 percent of the time (i.e., near the maximum) and this is often known as the "intrusive sound level." The L_{90} is the sound level exceeded 90 percent of the time and is often considered the "effective background level" or "residual noise level."

- **Maximum Sound Level (L_{max})**. The highest RMS sound level measured during the measurement period.
- **Root Mean Square Sound Level (RMS).** The square root of the average of the square of the sound pressure over the measurement period.
- **Day-Night Sound Level (L_{dn} or DNL).** The energy-average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the sound levels occurring during the period from 10:00 PM to 7:00 AM.
- **Community Noise Equivalent Level (CNEL).** The energy average of the A-weighted sound levels occurring during a 24-hour period, with 5 dB added from 7:00 PM to 10:00 PM and 10 dB from 10:00 PM to 7:00 AM. NOTE: For general community/environmental noise, CNEL and L_{dn} values rarely differ by more than 1 dB (with the CNEL being only slightly more restrictive – that is, higher than the L_{dn} value). As a matter of practice, L_{dn} and CNEL values are interchangeable and are treated as equivalent in this assessment.
- **Peak Particle Velocity (PPV).** The peak rate of speed at which soil particles move (e.g., inches per second) due to ground vibration.
- **Sensitive Receptor.** Noise- and vibration-sensitive receptors include land uses where quiet environments are necessary for enjoyment and public health and safety. Residences, schools, motels and hotels, libraries, religious institutions, hospitals, and nursing homes are examples.

Characteristics of Sound

When an object vibrates, it radiates part of its energy in the form of a pressure wave. Sound is that pressure wave transmitted through the air. Technically, airborne sound is a rapid fluctuation or oscillation of air pressure above and below atmospheric pressure that creates sound waves.

Sound can be described in terms of amplitude (loudness), frequency (pitch), or duration (time). Loudness or amplitude is measured in dB, frequency or pitch is measured in Hertz [Hz] or cycles per second, and duration or time variations is measured in seconds or minutes.

Amplitude

Unlike linear units such as inches or pounds, decibels are measured on a logarithmic scale. Because of the physical characteristics of noise transmission and perception, the relative loudness of sound does not closely match the actual amounts of sound energy. Table 1 presents the subjective effect of changes in sound pressure levels. Ambient sounds generally range from 30 dBA (very quiet) to 100 dBA (very loud). Changes of 1 to 3 dB are detectable under quiet, controlled conditions, and changes of less than 1 dB are usually not discernible (even under ideal conditions). A 3 dB change in noise levels is considered the minimum change that is detectable with human hearing in outside environments. A change of 5 dB is readily discernible to most people in an exterior environment, and a 10 dB change is perceived as a doubling (or halving) of the sound.

Table 1 Noise Perceptibility

Change in dB	Noise Level

± 3 dB	Barely perceptible increase
± 5 dB	Readily perceptible increase
± 10 dB	Twice or half as loud
± 20 dB	Four times or one-quarter as loud

Source: California Department of Transportation (Caltrans). 2013, September. Technical Noise Supplement ("TeNS").

Frequency

The human ear is not equally sensitive to all frequencies. Sound waves below 16 Hz are not heard at all, but are "felt" more as a vibration. Similarly, though people with extremely sensitive hearing can hear sounds as high as 20,000 Hz, most people cannot hear above 15,000 Hz. In all cases, hearing acuity falls off rapidly above about 10,000 Hz and below about 200 Hz.

When describing sound and its effect on a human population, A-weighted (dBA) sound levels are typically used to approximate the response of the human ear. The A-weighted noise level has been found to correlate well with people's judgments of the "noisiness" of different sounds and has been used for many years as a measure of community and industrial noise. Although the A-weighted scale and the energy-equivalent metric are commonly used to quantify the range of human response to individual events or general community sound levels, the degree of annoyance or other response also depends on several other perceptibility factors, including:

- Ambient (background) sound level
- General nature of the existing conditions (e.g., quiet rural or busy urban)
- Difference between the magnitude of the sound event level and the ambient condition
- Duration of the sound event
- Number of event occurrences and their repetitiveness
- Time of day that the event occurs

Duration

Time variation in noise exposure is typically expressed in terms of a steady-state energy level equal to the energy content of the time varying period (called L_{eq}), or alternately, as a statistical description of the sound level that is exceeded over some fraction of a given observation period. For example, the L_{50} noise level represents the noise level that is exceeded 50 percent of the time; half the time the noise level exceeds this level and half the time the noise level is less than this level. This level is also representative of the level that is exceeded 30 minutes in an hour. Similarly, the L_2, L_8 and L_{25} values represent the noise levels that are exceeded 2, 8, and 25 percent of the time or 1, 5, and 15 minutes per hour, respectively. These "n" values are typically used to demonstrate compliance for stationary noise sources with many cities' noise ordinances. Other values typically noted during a noise survey are the L_{min} and L_{max}. These values represent the minimum and maximum root-mean-square noise levels obtained over the measurement period, respectively.

Because community receptors are more sensitive to unwanted noise intrusion during the evening and at night, state law and many local jurisdictions use an adjusted 24-hour noise descriptor called the Community Noise Equivalent Level (CNEL) or Day-Night Noise Level (L_{dn}). The CNEL descriptor requires that an artificial increment (or "penalty") of 5 dBA be added to the actual noise level for the hours from 7:00 PM to 10:00 PM and 10 dBA for the hours from 10:00 PM to 7:00 AM. The L_{dn} descriptor uses the same methodology

except that there is no artificial increment added to the hours between 7:00 PM and 10:00 PM. Both descriptors give roughly the same 24-hour level, with the CNEL being only slightly more restrictive (i.e., higher). The CNEL or L_{dn} metrics are commonly applied to the assessment of roadway and airport-related noise sources.

Sound Propagation

Sound dissipates exponentially with distance from the noise source. This phenomenon is known as "spreading loss." For a single-point source, sound levels decrease by approximately 6 dB for each doubling of distance from the source (conservatively neglecting ground attenuation effects, air absorption factors, and barrier shielding). For example, if a backhoe at 50 feet generates 84 dBA, at 100 feet the noise level would be 79 dBA, and at 200 feet it would be 73 dBA. This drop-off rate is appropriate for noise generated by on-site operations from stationary equipment or activity at a project site. If noise is produced by a line source, such as highway traffic, the sound decreases by 3 dB for each doubling of distance over a reflective ("hard site") surface such as concrete or asphalt. Line source noise in a relatively flat environment with ground-level absorptive vegetation decreases by an additional 1.5 dB for each doubling of distance.

Psychological and Physiological Effects of Noise

Physical damage to human hearing begins at prolonged exposure to noise levels higher than 85 dBA. Exposure to high noise levels affects the entire system, with prolonged noise exposure in excess of 75 dBA increasing body tensions, thereby affecting blood pressure and functions of the heart and the nervous system. Extended periods of noise exposure above 90 dBA results in permanent cell damage, which is the main driver for employee hearing protection regulations in the workplace. For community environments, the ambient or background noise problem is widespread, through generally worse in urban areas than in outlying, less-developed areas. Elevated ambient noise levels can result in noise interference (e.g., speech interruption/masking, sleep disturbance, disturbance of concentration) and cause annoyance. Since most people do not routinely work with decibels or A-weighted sound levels, it is often difficult to appreciate what a given sound pressure level number means. To help relate noise level values to common experience, Table 2 shows typical noise levels from familiar sources.

Table 2 Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Onset of physical discomfort	120+	
	110	Rock Band (near amplification system)
Jet Flyover at 1,000 feet		
	100	
Gas Lawn Mower at three feet		
	90	
Diesel Truck at 50 feet, at 50 mph		Food Blender at 3 feet
	80	Garbage Disposal at 3 feet
Noisy Urban Area, Daytime		
	70	Vacuum Cleaner at 10 feet
Commercial Area		Normal speech at 3 feet
Heavy Traffic at 300 feet	60	
		Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (background)
Quiet Suburban Nighttime		
	30	Library
Quiet Rural Nighttime		Bedroom at Night, Concert Hall (background)
	20	
		Broadcast/Recording Studio
	10	
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

Source: California Department of Transportation (Caltrans). 2013, September. Technical Noise Supplement ("TeNS").

Vibration Fundamentals

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Vibration is normally associated with activities stemming from operations of railroads or vibration-intensive stationary sources, but can also be associated with construction equipment such as jackhammers, pile drivers, and hydraulic hammers. As with noise, vibration can be described by both its amplitude and frequency. Vibration displacement is the distance that a point on a surface moves away from its original static position; velocity is the instantaneous speed that a point on a surface moves; and acceleration is the rate of change of the speed. Each of these descriptors can be used to correlate vibration to human response, building damage, and acceptable equipment vibration levels. During construction, the operation of construction equipment can cause groundborne vibration. During the operational phase of a project, receptors may be subject to levels of vibration that can cause annoyance due to noise generated from vibration of a structure or items within a structure.

Vibration amplitudes are usually described in terms of either the peak particle velocity (PPV) or the root mean square (RMS) velocity. PPV is the maximum instantaneous peak of the vibration signal and RMS is the

square root of the average of the squared amplitude of the signal. PPV is more appropriate for evaluating potential building damage and RMS is typically more suitable for evaluating human response.

As with airborne sound, annoyance with vibrational energy is a subjective measure, depending on the level of activity and the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Persons accustomed to elevated ambient vibration levels, such as in an urban environment, may tolerate higher vibration levels. Table 3 displays the human response and the effects on buildings resulting from continuous vibration (in terms of various levels of PPV).

Table 3 Human Reaction to Typical Vibration Levels

Vibration Level, PPV (in/sec)	Human Reaction	Effect on Buildings
0.006–0.019	Threshold of perception, possibility of intrusion	Vibrations unlikely to cause damage of any type
0.08	Vibrations readily perceptible	Recommended upper level of vibration to which ruins and ancient monuments should be subjected
0.10	Level at which continuous vibration begins to annoy people	Virtually no risk of "architectural" (i.e. not structural) damage to normal buildings
0.20	Vibrations annoying to people in buildings	Threshold at which there is a risk to "architectural" damage to normal dwelling – houses with plastered walls and ceilings
0.4–0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause "architectural" damage and possibly minor structural damage

Source: California Department of Transportation (Caltrans). 2020, April. *Transportation and Construction Vibration Guidance Manual*. Prepared by ICF International.

LOCAL REGULATIONS AND STANDARDS

PUBLIC SAFETY

ELEMENT

CONTENTS

LIST OF TABLES

LIST OF FIGURES

OVERVIEW OF THE ELEMENT

Purpose

The Public Safety Element sets forth goals and policies focused toward enhancing the quality of life in South El Monte by providing a safe and relatively quiet environment for all community members. The Public Safety Element addresses natural and human-induced hazards that have the potential to impact the community, including hazards associated with excessive noise.

Natural hazards of concern in the City include geologic and seismic disasters such as earthquakes and their related effects, as well as flood hazards. Because South El Monte lies within a densely populated urban environment, future development requires careful consideration of geologic conditions and earthquake activity to ensure that risk to life and property are minimized. Planning for natural disasters heightens the community's ability to respond to an emergency.

Human-induced hazards present in the community are limited to urban fires, excessive noise, crime, and hazardous material accidents, which have the potential to cause serious personal injury and property damage. The Public Safety Element identifies the risks associated with these hazards, and outlines goals and policies that address safety and noise problems in the community. A coordinated planning process that considers effects of certain land uses on surrounding properties works toward ensuring public safety.

The goals presented in this Element focus on creating a safe environment, planning for all types of disasters, incorporating defensible designs for crime prevention, and reducing the potential for personal injury and property damage arising from natural and human-induced hazards.

Important Terms and Concepts

Describing some of the public safety issues addressed in this element requires use of certain technical terms and planning concepts not used in everyday conversation. The definitions below highlight the key terms used.

Earthquake Magnitude: An earthquake's magnitude is based on the size of the earthquake's seismic waves recorded on a seismogram. Magnitude of an earthquake is different from an earthquake's intensity, which is the effect of an earthquake on structures and people. Magnitude generally is rated and expressed using the Richter scale, which is a logarithmic scale. The amount of energy released, for example, from a 6.0 earthquake is 10 times greater than that associated with a 5.0 event. A large earthquake is considered to have a magnitude of 7.0 or greater. For purposes of comparison,

the 1987 Whittier earthquake registered a 5.9 magnitude, while the 1994 Northridge temblor was measured at 6.7.

100-year Flood: A 100-year flood event is a flood event that has a probability of occurring once every 100 years, or that has a 1-in-100 chance of occurring in a given year. The 100-year flood is not necessarily the greatest flood that could possibly occur in an area. Flooding from normal winter storms, when storm drain systems are filled to capacity or are clogged with debris, has the potential to be as disastrous as the 100-year flood.

Floodplain areas are mapped by the Federal Emergency Management Agency as part of the National Flood Insurance Program. Flood Insurance Rate Maps categorize flood prone areas into flood zones, including the 100-year and 500-year flood zones.

Noise Standards: Noise is generally defined as unwanted or intrusive sound. Because noise consists of pitch, loudness, and duration, it is difficult to describe noise with a single unit of measure. The A-weighted decibel scale (dBA) is used to describe the loudness of a sound, or noise environment.

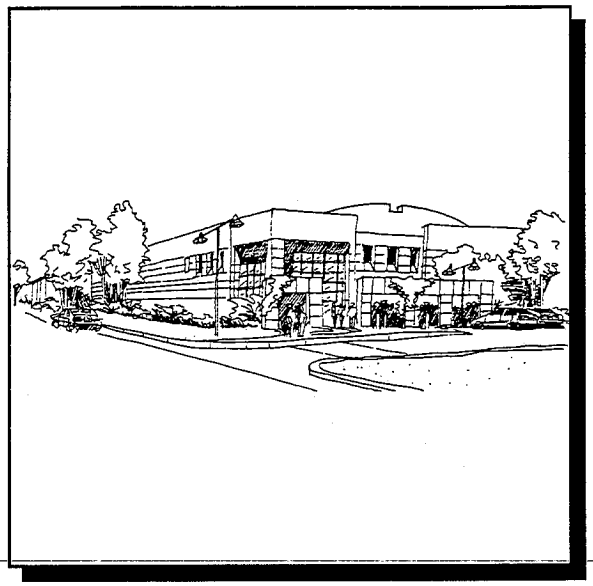
Federal and state agencies have established noise and land use compatibility guidelines that use averaging approaches to noise measurement. Two measurement scales commonly used in California are the Community Noise Equivalent Level (CNEL) and the day-night level (L_{dn}). In order to account for increased human sensitivity at night, the CNEL level includes a five-decibel penalty on noise during the 7:00 p.m. - 10:00 p.m. time period and a ten-decibel penalty on noise during the 10:00 p.m. - 7:00 a.m. time period. The L_{dn} level includes only the ten decibel weighting for late-night noise. These values are nearly identical for all but unusual noise sources.

The Federal and State guidelines established for noise/land use compatibility are all based upon cumulative noise criteria such as L_{eq} (equivalent noise level), CNEL, or L_{dn}. The State Department of Housing and Community Development regulates noise levels in residential areas, requiring that sufficient insulation be provided to reduce interior ambient noise levels to 45 dBA CNEL.

Defensible Space: Defensible space is a design concept that promotes site planning and building design features aimed toward preventing safety and security problems. Defensible spaces are areas that are highly visible and well lighted to deter vandals and criminals. Defensible design can be incorporated into both industrial and commercial development, as well as housing.

The illustrations on the following page show typical design standards that can promote public safety. Defensible design features that can be incorporated into nonresidential development include the following:

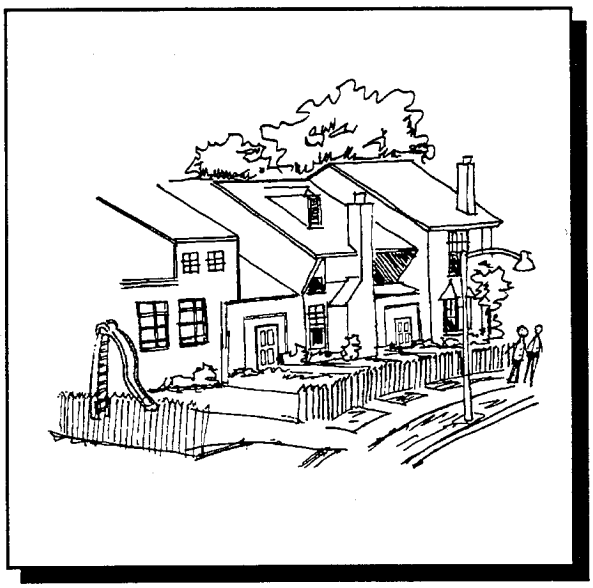
- Well-lighted parking lots and driveways.
- Walkways that are well defined and connected to a particular building.
- Gates that help transition visitors and employees from the parking lot or street to the interior of the building.
- Exterior areas that are visible from the surrounding structures and businesses.



Defensible design for commercial and industrial developments

Residential defensible design features include the following:

- Well-lighted driveways and parking areas.
- Walkways that are well defined and connected to a particular home or property.
- Gates that help transition visitors and residents from the driveway or street to the interior of the home.
- Entrances that are visible from the street and surrounding homes.
- Visible common recreation areas.



Defensible design for residential uses

Related Plans and Programs

Other City and regional plans and programs related to the public safety and emergency response planning include the City's *Emergency Operations Manual,* the Federal Emergency Management Agency's flood insurance program, and mutual aid agreements that South El Monte maintains with surrounding jurisdictions. These and other safety-related programs are described below. Related programs are important to consider to ensure that the City has strong, comprehensive, and compatible tools to guide development decisions.

South El Monte *Emergency Operations Manual*

The South El Monte *Emergency Operations Manual* was developed to address the City's planned response to extraordinary emergencies such as natural disasters, technological incidents, and nuclear defense operations. Developed as a preparedness document, the purpose of the operations manual is to ensure appropriate response to a variety of emergency situations. The City's *Emergency Operations Manual* is part of a statewide emergency management system. The plan includes operational concepts, identifies management organization, and describes responsibilities in the event of an emergency. The plan is categorized by phases in which to operate before, during, and after an emergency.

An emergency plan is essential to a community for implementing emergency response. The plan is most effective when it is well publicized and easily understood by the community.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act of 1990 requires the State Geologist to compile maps identifying and describing seismic hazard zones throughout California. Guidelines prepared by the State Mining and Geology Board identify the responsibilities of State and local agencies in the review of development within seismic hazard zones. Development on a site that has been designated as a seismic hazard zone requires a geotechnical report and local agency consideration of the policies and criteria established by the Mining and Geology Board (Public Resources Code Section 2690 et seq.).

FEMA Flood Insurance Program

The National Flood Insurance Act includes provisions for the National Flood Insurance Program. Participating jurisdictions must exercise land use controls and purchase flood insurance as a prerequisite for receiving funds to purchase or build a structure in a flood hazard area. The opportunity exists for the City to participate in the National Flood Insurance Program (NFIP) through the Federal Emergency Management Agency (FEMA). The NFIP provides federal flood insurance subsidies and federally financed loans for eligible property owners in flood-prone areas.

The City is rated as being within a "No Special Flood Hazard Area." Should this rating change at any time, NFIP benefits would be available to South El Monte.

Mutual Aid Agreements

The statewide mutual aid system was designed to ensure that adequate resources, facilities, and other support are provided to jurisdictions whenever their own resources prove to be inadequate to cope with a given situation. The statewide system is divided into six regions. South El Monte lies within Mutual Aid Region One, which includes Los Angeles and Orange Counties. The City maintains mutual aid agreements that require:

- Developing and maintaining current emergency plans which are compatible with the California Emergency Plan and the California Master Mutual Aid Agreement, and are designed to apply local resources in meeting the emergency requirements of the immediate community or its neighbors, and coordinate such plans with those neighboring jurisdiction's to ensure mutual compatibility.
- Maintaining liaison with the appropriate Office of Emergency Services (OES) Mutual Aid Region Office and neighboring jurisdictions.
- Responding to requests for mutual aid.
- Dispatching situation reports to the appropriate Operational Area Coordinator and/or OES Mutual Aid Region as the emergency situation develops and as changes in the emergency situation dictate.
- Requesting assistance from neighboring jurisdictions, and/or the Operational Area, as necessary and feasible.
- Receiving and employing resources as may be provided by neighboring jurisdictions and state, federal, and private agencies.
- Carrying out emergency regulations issued by the Governor.

California Environmental Quality Act Law and Guidelines (CEQA)

The California Environmental Quality Act, or CEQA, requires a thorough analysis of potential environmental consequences resulting from a development project or from a plan that guides future development. CEQA provides a means by which City officials and the general public can identify the potential impacts a project will have on the community, and to allow for mitigation or avoidance of such impacts.

California Noise Insulation Standards (Title 24)

In 1974 the California Commission on Housing and Community Development adopted noise insulation standards for residential buildings (Title 24, Part 2, California Code of Regulations). Title 24 establishes standards for interior room noise (attributable to outside noise sources) and also specifies that acoustical studies must be prepared whenever a residential building or structure is proposed to be located within exterior CNEL (or L_{dn}) contours of 60 dB or greater attributable to an existing or adopted

freeway, expressway, parkway, major street, thoroughfare, rail line, rapid transit line, or industrial noise source. The acoustical analysis must show that the building has been designed to limit intruding noise to an interior CNEL (or L_{dn}) of 45 dB.

Summary of Issues

Geologic and Seismic Hazards

Geologic and seismic issues relevant to South El Monte include the following:

- Proximity of earthquake faults relative to important emergency facilities in South El Monte. The Whittier Heights Fault passes close to South El Monte City Hall, the Greater El Monte Community Hospital, and the fire station.

- The durability of structures, given the threat of earthquakes from local and regional faults. Unreinforced structures built prior to 1974 are particularly susceptible to earthquake damage and present potential hazards to persons.

- Subsurface soil conditions in association with shallow groundwater. Groundwater depths in many areas of the City range from 15 to 35 feet below the surface. In the event of an earthquake, such conditions can cause soils to "liquefy" and loose structure, posing hazards to buildings lacking appropriate footings and foundations. State seismic hazards maps identify South El Monte as lying entirely within a liquefaction hazard zone. Excavations for large projects may encounter groundwater and possibly will require liquefaction studies and appropriate remediation.

Flood Hazards

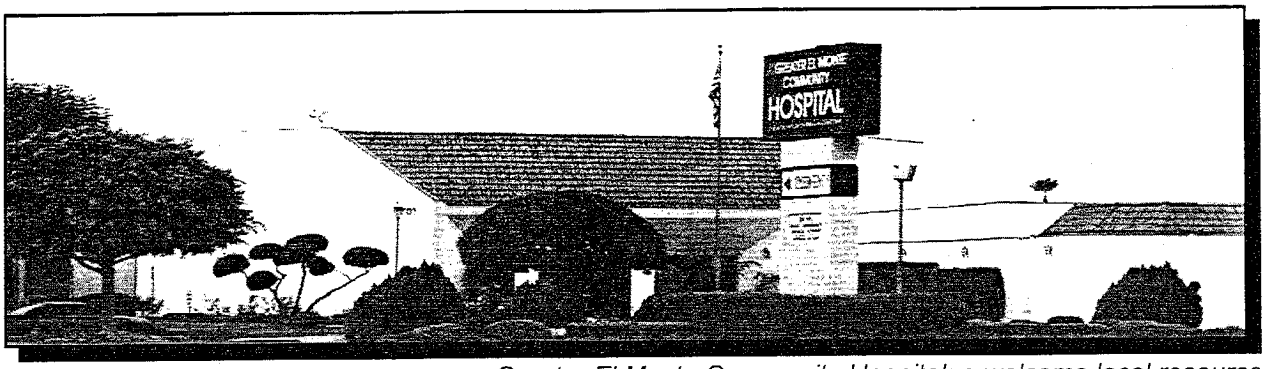
The following issues are important for protecting the community from flood damage resulting from storms and potential dam failure:

- The location and level of flood zones. The area immediately south of State Route 60 (Pomona Freeway) is susceptible to flooding during major storm events. Also, ponding on certain local streets occurs during heavy rainfalls.

- South El Monte lies within the inundation area for the Santa Fe and Puddingstone Dams. While the City has no control over these facilities, appropriate disaster planning and advocacy efforts work to minimize hazards.

Urban Noise and Land Use Planning

Noise in the urban environment can affect the quality of life for residents. South El Monte is subjected to typical urban noises such as noise generated by traffic, heavy machinery, and day-to-day outdoor activities. Noise caused by aircraft flying in and out of El Monte Airport does not affect the community and is not a concern. Important noise considerations include:



Greater El Monte Community Hospital: a welcome local resource

- As the population increases in and around the City, traffic volumes will increase and present potential noise problems along primary travel routes such as Rosemead Boulevard, Garvey Avenue, Peck Road, and Durfee Avenue.

- Noise levels from traffic on the Pomona Freeway will impact adjacent residential neighborhoods.

- Noise created from temporary activities such as construction and gardening can impact adjacent properties.

- Industrial and commercial activities that use heavy machinery may create excessive noise levels. Of particular concern are impacts on residential uses located within industrial areas of South El Monte.

Fire Hazards And Hazardous Materials

Urban fire hazards arise from the presence of businesses that use, store, or manufacture flammable and/or explosive materials. Persons living in homes located within and adjacent to industrial zones may be exposed to such hazards.

Emergency Preparedness

Recognizing the hazards that pose risks to life and property represents the first step toward planning appropriate emergency response. Emergency preparedness planning must also consider:

- The need to address both natural and human-induced disaster response.

- Appropriate fire-fighting and protection services to address urban fire hazards, coupled with adequate infrastructure and access.

- The presence of housing in industrial zones.

- The location of emergency response facilities relative to hazard zones, transportation routes, and the population being served.

Crime Prevention

The following crime prevention issues are important for ensuring public safety:

- Using defensible designs for new construction and redevelopment in the City, to work in tandem with law enforcement efforts.

GEOLOGIC AND SEISMIC HAZARDS

Geologic and seismic activity have the potential to create widespread personal injury and property damage. South El Monte is affected by several seismic and geologic hazards at both the regional and local levels. High-intensity ground shaking (earthquake-induced strong ground motion), ground failure (liquefaction and shallow groundwater, and dynamic compaction and consolidation), and seismically induced surface rupture (fault rupture) represent the primary hazards.

At the local level, ground surface fault rupture could occur along the Whittier Heights fault, a splay of which has been mapped through South El Monte as a buried fault. Figure PS-1 identifies the fault trace beneath the interchange of the Pomona and San Gabriel River freeways, passing northwest to about Tyler Street. Geological evidence suggests that the fault is sufficiently buried so as not to represent a risk of ground surface rupture in the event of an earthquake. The primary associated hazard is ground shaking. Ground shaking, depending on its severity and duration, in a worst case situation can cause buildings to wholly or partially collapse.

An important consideration regarding the Whittier Heights fault is the fact that the fault passes near City Hall and the Greater El Monte Community Hospital. These critical facilities must remain functional during any type of disaster. This condition is discussed below under *Emergency Preparedness*.

The regional faults that would have the most adverse ground shaking effects on the City are the Whittier-North Elsinore Fault, the Elysian Park fault system, the Sierra Madre-San Fernando fault zone, and the San Andreas fault zone (Mojave segment) (Figure PS-2).

The effect of an earthquake originating along any given fault will depend upon its distance from South El Monte and the size earthquake that the fault is likely to generate. The largest estimated (credible) earthquake along the Whittier-North Elsinore Fault, the closest known active fault, is estimated to be 7.5 on the Richter Scale. Of the known active faults within a 62-mile radius of South El Monte, the San Andreas Fault is expected to have the greatest magnitude (8.3 Richter scale). However, because of its distance from the City, the intensity of ground shaking expected to be felt in South El Monte from an earthquake on the San Andreas is less than the intensity of an earthquake of lower magnitude along a fault located closer to the City.

Other effects directly related to ground shaking include pipeline rupture, street cracking, and objects falling within homes and businesses. Secondary effects that can result from ground shaking are ground subsidence, liquefaction, ground buckling, and dam failure. In South El Monte, seismic-related issues to account for in land use planning are liquefaction, pipeline rupture, and inundation due to dam failure.

As described in the *Summary of Issues* section of this element, liquefaction represents a condition whereby a combination of high groundwater and loose soils causes soils to

lose cohesion, or "liquefy," when subject to intense shaking. Buildings located on such soils can collapse if they lack appropriate footings and foundations. The entire City of South El Monte is located within a liquefaction zone.

A 30-inch diameter high pressure gas pipeline extends along Fern Street-Elliot Avenue, passing through the City in an east-west direction. A 16-inch diameter high pressure line parallels Tyler Avenue north of Weaver Avenue. If the lines were to rupture in the event of an earthquake, a fire might result. The use of Tyler and Rosemead Avenues as evacuation routes could be affected.

Dam failure due to seismic activity has the potential to impact South El Monte and many communities in the San Gabriel Valley. The Santa Fe Dam in the San Gabriel Mountain foothills and Puddingstone Dam near San Dimas represent the two dams of concern. The U.S. Army Corps of Engineers flood emergency plan data indicate that failure of the Santa Fe Dam would result in the entire area of the City being flooded. Water depths would range from two to ten feet, with shallower depths in the northern portion and deeper in the southern portion of the City. Figure PS-3 indicates the potential extent and the depth of such flooding and the speed of flood water flows.

State law requires every reservoir owner to develop and maintain an emergency plan to be implemented if the dam is catastrophically breached. Each dam-specific emergency plan includes a map that shows the potential limits of a flood that could result if the dam should fail while filled to capacity. These flood maps are pictured as a worst-case scenario. Since most dams in Southern California are not normally filled to capacity, the possibility of inundation from either dam is remote.

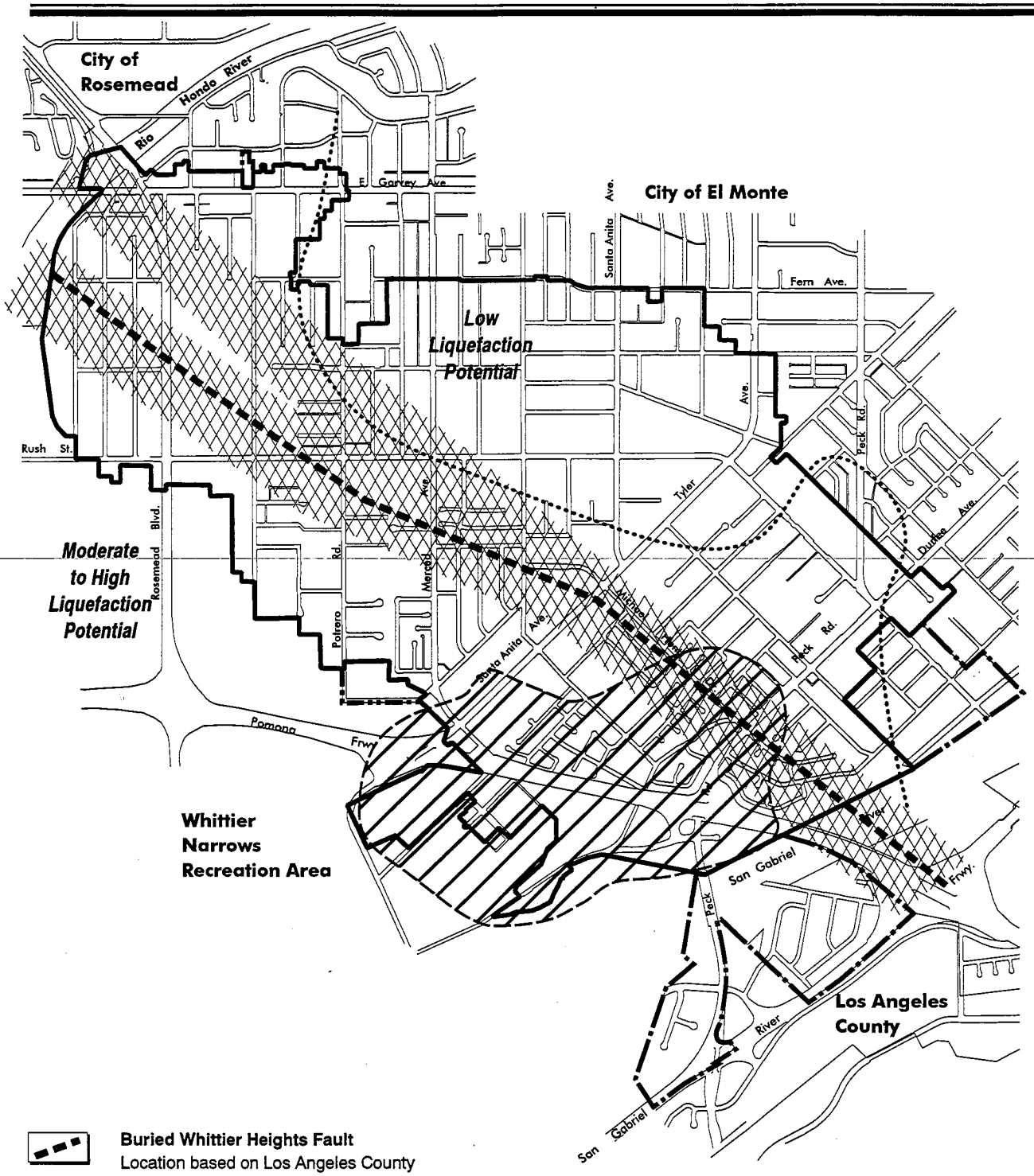
Goal 1.0
Reduce the risk of danger related to natural hazards.

Policy 1.1
Establish an ordinance requiring the retrofit of unreinforced masonry buildings and the seismic reinforcement of buildings constructed prior to 1971 that are susceptible to damage in the event of an earthquake.

Policy 1.2
Require liquefaction studies to be prepared for new development proposed to be located in areas of the City with high susceptibility to liquefaction hazards.

Policy 1.3
Work with owners of high pressure gas lines to ensure that the lines are adequately safeguarded against rupture in the event of an earthquake.

Policy 1.4
Participate in regional programs to establish early warning systems that will alert residents and business people in the event of dam failure.



Buried Whittier Heights Fault
Location based on Los Angeles County Safety Element (1990; Plate 1)

Cautionary Zone for Potential Surface Fault Rupture
Defined as 500 feet from possible buried fault features

Area Where Non-Engineered Fill May Be a Stability Concern

City Boundary

Sphere of Influence

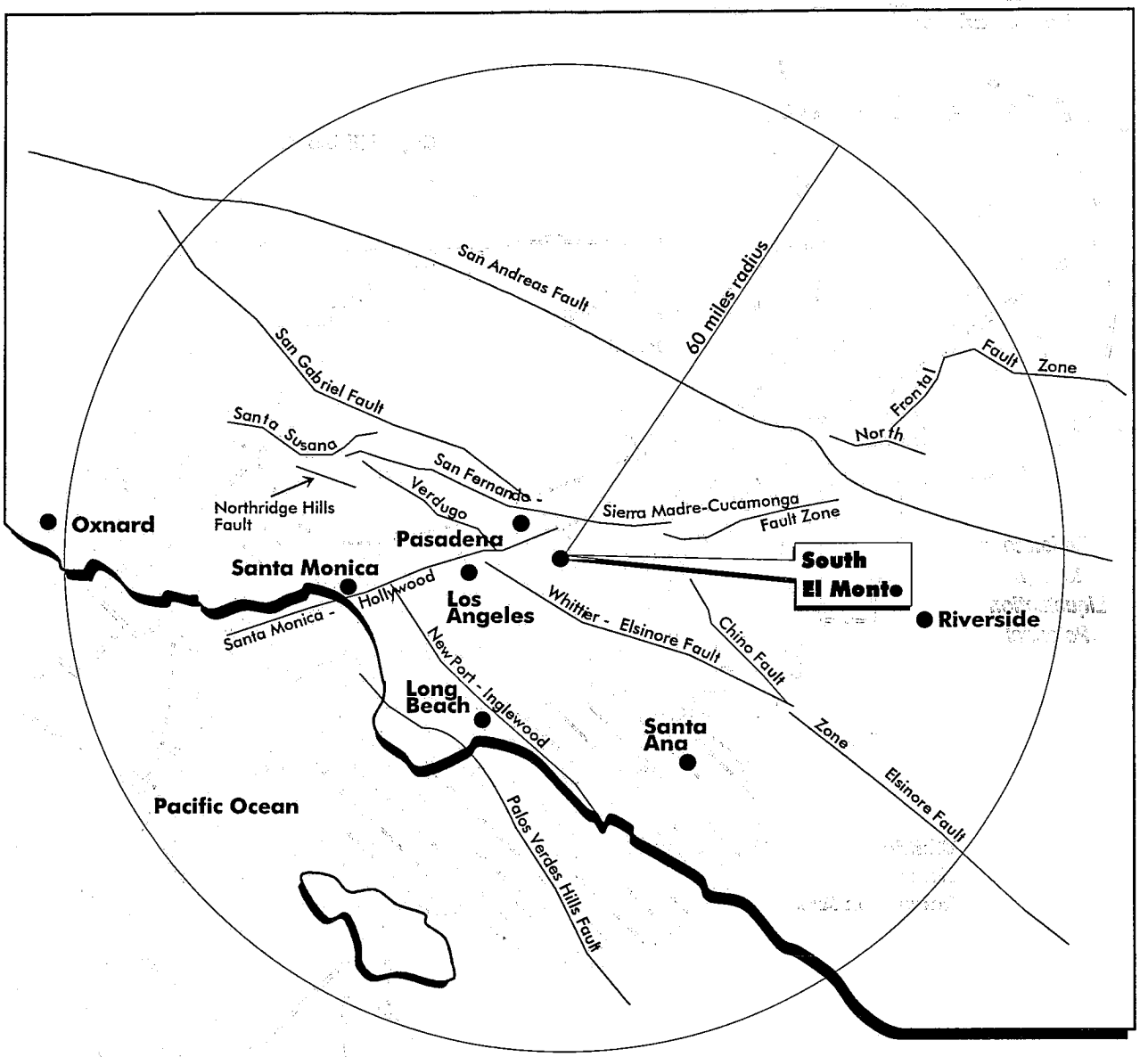
Area of Interest

South El Monte General Plan

N

1000' 0 1000' 2000'

Figure PS-1
Local Geologic Conditions



South El Monte
General Plan

Figure PS-2
Regional Faults

FLOOD HAZARDS

Flooding has the ability to create considerable personal injury and damage to property. The risk of flood damage can be reduced through proper land use planning and development of an adequate emergency response plan. Floods caused by extreme weather conditions or dam failure of the Santa Fe or Puddingstone Dam, discussed above, are the most likely types of flooding to occur in South El Monte.

Although South El Monte does not lie within a delineated 100-year flood zone, localized ponding related to storm water runoff represents a minor flood hazard. Figure PS-3 identifies those areas of the City susceptible to ponding. The problems result largely from inadequate drainage devices and/or streets that were not designed to accommodate the current runoff levels. Also, the City's location at the low end of the regional drainage basin creates conditions whereby storm waters can easily overwhelm the drainage system during a sudden, heavy rain storm.

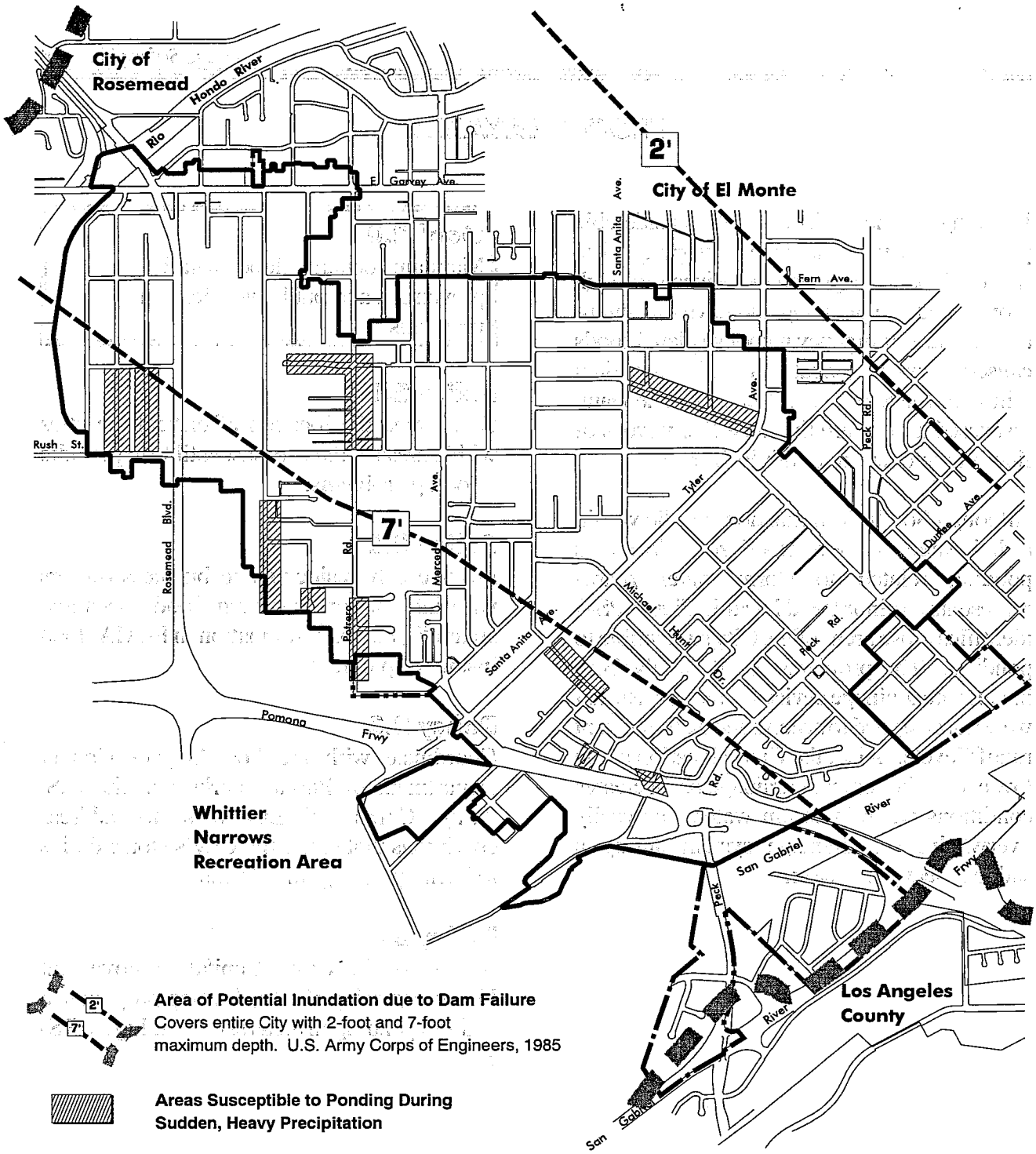
Goal 2.0
Maintain adequate flood hazard prevention and public notification programs.

Policy 2.1
Discourage the location of critical facilities within areas of the City susceptible to periodic flooding problems.

Policy 2.2
Provide City residents and business owners with information regarding flood zones and areas eligible for participation in FEMA flood insurance programs.

Policy 2.3
Coordinate with the Los Angeles County Department of Public Works and the U.S. Army Corps of Engineers to address conditions that cause the City's storm drains to back up during rain storms.

Policy 2.4
As part of the City's Capital Improvement Plan programing efforts, develop programs to address ponding in areas shown in Figure PS-3.



Area of Potential Inundation due to Dam Failure
Covers entire City with 2-foot and 7-foot maximum depth. U.S. Army Corps of Engineers, 1985

Areas Susceptible to Ponding During Sudden, Heavy Precipitation

City Boundary

Sphere of Influence

Area of Interest

N

1000' 0 1000' 2000'

South El Monte General Plan

Figure PS-3
Dam Inundation Zones and Areas Susceptible to Ponding

NOISE AND LAND USE PLANNING

Construction projects, industrial operations, property maintenance, and other activities that require the use of machinery can generate significant noise. Also, vehicle traffic along the City's street system can cause substantial noise intrusion into residential neighborhoods. Figure PS-4 identifies future projected noise levels that are expected to result from traffic activity.

Early consideration of the relationship between the sources and recipients of noise represents one way to minimize noise impacts throughout the community. Some areas that are already impacted by noise may require improvements to increase compatibility. The following measures will help to reduce the impacts of noise on City residents.

Goal 3.0
Minimize the adverse effects of excessive or unusual noise on the City's residential and business populations.

Policy 3.1
Use the noise/land use compatibility standards presented in Table PS-1 as a guide for future planning and development decisions.

Policy 3.2
Enforce the City's noise ordinance using both City code enforcement and law enforcement personnel.

Policy 3.3
Work with Caltrans to ensure timely construction of sound walls to protect residential neighborhoods from freeway noise.

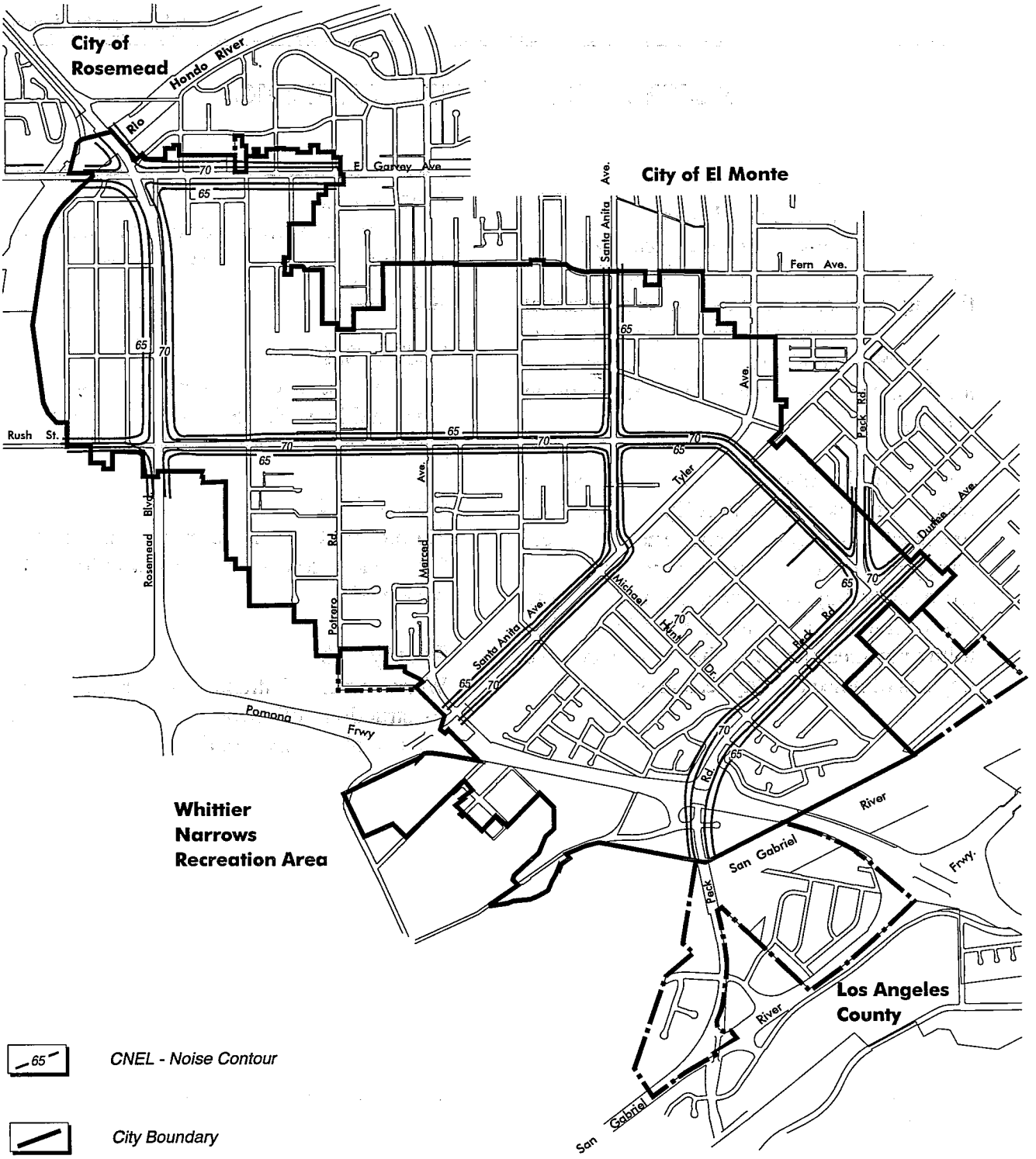


Figure PS-4
Future Noise Contours

Table PS-1
Noise/Land Use Compatibility Chart

Land Use Categories		Community Noise Equivalent Level (CNEL)						
Categories	Land Uses	<55	60	65	70	75	80>	
Residential	Single-Family, Duplex, Multiple Family, Mobile Homes	A	B	C	C	C	D	D
Mixed Use	Residential, Retail, and Service Commercial	A	B	B	C	C	C	D
Commercial	Hotel, Motel, Transient Lodging	A	A	B	B	C	C	D
Commercial	General Retail, Bank, Restaurant, Entertainment	A	A	A	B	B	B	C
Commercial Commercial Manufacturing Industrial Public Facilities	Professional Offices, Research and Development, City Hall	A	A	A	B	B	C	D
Commercial Commercial Manufacturing Industrial	Automobile Sales and Services, Manufacturing, Warehousing, Wholesale, Utilities	A	A	A	A	A	B	B
Public Facilities	Hospital, Church, Library, Schools	A	B	B	C	C	D	D
Parks	Parks	A	A	A	B	C	D	D

Zone A Clearly Compatible	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.
Zone B Normally Compatible	New construction or development should be undertaken only after detailed analysis of the noise reduction requirements are made and needed noise insulation features in the design are determined. Conventional construction with closed windows and fresh air supply systems or air conditioning, will normally suffice.
Zone C Requires Analysis and Mitigation	Potential noise impacts exist. If new construction or development is proposed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included in the design.
Zone D Clearly Incompatible	New construction or development should generally not be undertaken.

FIRE HAZARDS

The potential for fire hazards is increased when flammable and/or explosive materials are improperly stored, handled, or used. Fire protection, education, and awareness will help ensure the safety of the community. Adequate water supply and pressure also must be available to properly fight a fire.

In South El Monte, fire response and prevention services are provided by the Los Angeles County Fire Department. To provide appropriate service, the Department requires a minimum street width of 26 feet, as well as sufficient clearances around structures. Minimum safety standards for water supply, road width, access, and turning radius for fire vehicles are required to ensure public safety and to maintain an adequate level of fire protection.

Goal 4.0
Strive to maintain the following Insurance Service Organization (ISO) ratings citywide: rating of 3 for residential uses and rating 3 for commercial and industrial uses.

Policy 4.1
Review the City's contract with the Los Angeles County Fire Department annually to ensure that adequate fire protection services are provided.

Policy 4.2
Maintain programs that require the periodic inspection of businesses that use, store, or manufacture flammable and/or explosive materials.

Policy 4.3
Utilize the expertise of County Fire Department personnel to review development proposals where fire hazards are of concern.

HAZARDOUS MATERIALS

The California Health and Safety Code defines a hazardous material as any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant potential hazard to human health and safety, or to the environment if released into the work place or environment. Release of hazardous materials can occur during natural disasters, such as earthquakes. High temperatures can cause some materials to explode or ignite. Release can also occur from improper storage and handling. As an industrial community, South El Monte has a multitude of businesses that maintain hazardous materials on site.

While Federal, State, and local regulations work to provide safeguards, accidents can happen. A condition of particular concern in South El Monte is the presence of residential homes within and adjacent to industrial uses that may manufacture, use, transport, handle, or dispose of hazardous materials. Residents, as well as business owners and employees, are in danger of suffering the consequences associated with an adverse hazardous materials incident.

Goal 5.0

Protect the resident and business populations from potential hazards associated with the use, storage, manufacture, and transportation of toxic and hazardous materials in and through the City.

Policy 5.1

Work toward the gradual removal of nonconforming residential uses from industrial zones.

Policy 5.2

Cooperate with responsible Federal, State, and county agencies to reduce the risk from the use and transport of hazardous materials.

Policy 5.3

Continue to contract with Los Angeles County for services provided by the Hazardous Materials Response Team.

EMERGENCY PREPAREDNESS

Any type of natural or human-induced disaster has the potential to impact infrastructure important to emergency response. Proper planning to ensure access to critical facilities such as utilities, freeways, roadways, schools, and emergency care facilities can work to minimize loss of life and property damage whenever disasters occur.

The City's Emergency Operations Manual will require updating on a regular basis to ensure that all appropriate services, facilities, and staff are well prepared for disaster. This manual includes evacuation procedures, identifies responsible parties, and names resources to use in the event of emergency.

One identified resource is the Greater El Monte Community Hospital, located on Santa Anita Avenue. The hospital was constructed in 1974 under strict seismic codes. The hospital lies about 500 feet northeast of the buried Whittier Fault, which may present problems should an earthquake occur along that particular fault. Given this circumstance, routine earthquake preparedness training should be conducted for hospital staff.

City Hall, which serves as the Emergency Operations Center (EOC), also lies in close proximity to the Whittier Fault. As described under *Geologic and Seismic Hazards* above, surface fault rupture is not a concern, but City Hall could be subject to extensive shaking associated with an earthquake along the fault. Emergency planning dictates that the EOC remain functional during any type of disaster.

Preparation for emergencies is imperative to reduce the risks associated with emergency situations. Personal injury and property damage can be minimized through the following goals, policies, and preventative measures.

Goal 6.0
Develop procedures to deal effectively with the City's response to natural and human-induced emergencies.

Policy 6.1
Keep the City's Emergency Plan up to date and relevant to all types of disasters affecting the City.

Policy 6.2
Ensure that the City's Emergency Plan includes procedures to provide assistance to residents unable to leave their homes in the event of an order to evacuate.

Policy 6.3
Promote continued public awareness of emergency procedures for South El Monte residents, the business population, City staff, and public officials.

Policy 6.4
Establish a secondary or back-up local emergency operations center that can function in the event of damage to the City's primary emergency operations center.

CRIME PREVENTION

South El Monte contracts with the Los Angeles County Sheriff's Department for law enforcement services. The contract is reviewed periodically to ensure that the City is receiving the appropriate level of crime prevention and response service.

Crime prevention allows a city to take positive action toward creating safe environments for residents, as well as creating an inviting business community. Incorporating defensible space considerations into site planning and building design represents a pro-active approach to deterring crime.

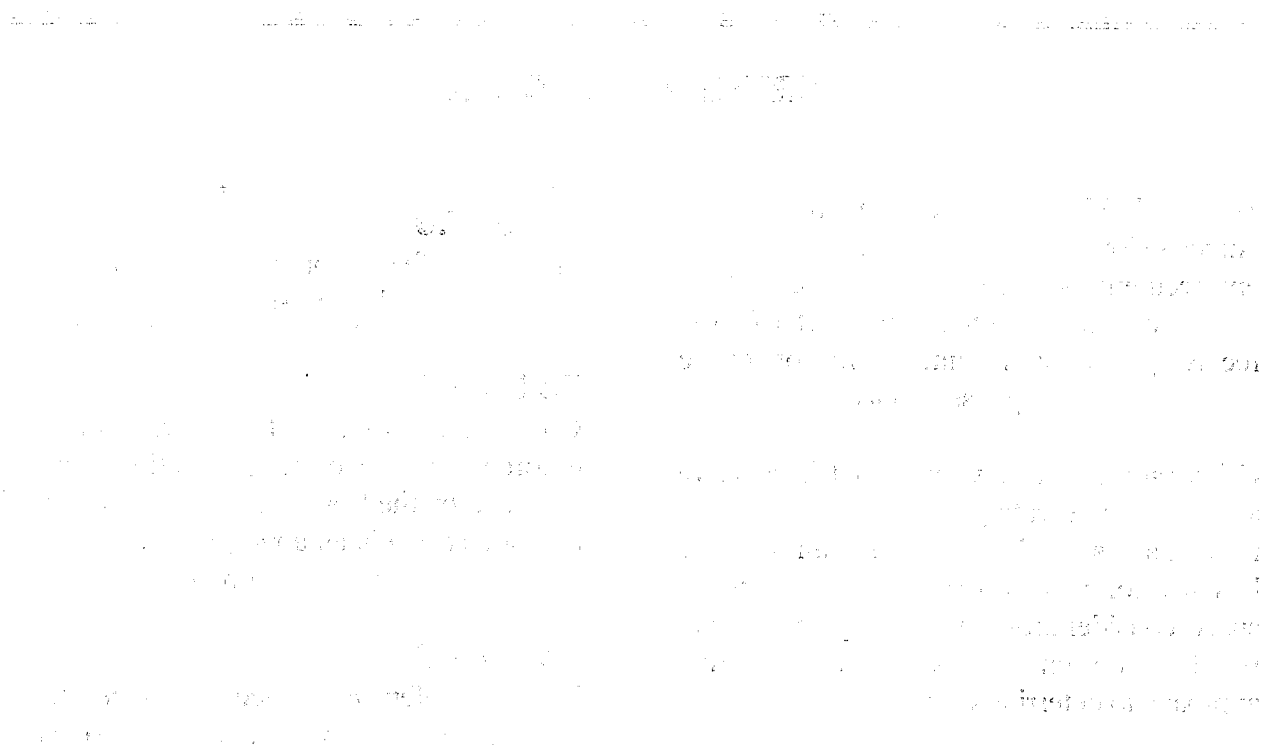
Goal 7.0
Provide safe environments for City residents and businesses.

Policy 7.1

Continually assess the level of law enforcement and crime prevention services provided by the Los Angeles County Sheriff, and adjust levels as appropriate to meet the City's community safety goals.

Policy 7.2

Develop defensible space guidelines to be used in the review of development proposals.



Chapter 8.20 - NOISE REGULATIONS

Sections:

8.20.010 - Definitions.

For the purposes of this chapter, the words, terms and phrases set forth below shall have the meanings and construction therein given, except where used in a context which clearly indicates a different meaning or construction:

A. "A-weighted sound level" means the sound level in decibels as measured on a sound level meter using the A-weighted network. The level so read is designated db(A) or dbA.

B. "Ambient noise level" means the normal or existing level of environmental noise at a given location, not including the particular noise being measured or considered.

C. "Decibel" means a unit for measuring the amplitude of a sound, equal to twenty times the logarithm to the base ten of the ratio of the pressure of the sound measured to a reference pressure of twenty micropascals.

D. "Impulsive sound" means a sound of short duration, usually less than one second, with an abrupt onset and a rapid decay. Examples of sources of impulsive sound include explosions, drop forge impacts, and the discharge of firearms.

E. "Intrusive noise" means noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency and time of occurrence, and tonal or information content as well as the prevailing ambient noise level.

F. "Noise disturbance" means any sound which (i) endangers or injures the safety or health of human beings or animals, or (ii) annoys or disturbs reasonable persons of normal sensitivities, or (iii) endangers or injures personal or real property or (iv) violates the limits set forth in Section 8.20.020.

G. "Public property" means any property or structures owned or controlled by a governmental entity, including easements for road purposes.

H. "Real property boundary" means an imaginary line along the ground surface, and its vertical extension, which separates the real property owned by one party from that owned by another.

I. "Sound level meter" means an instrument, including a microphone, an amplifier, an output meter, and frequency weighting networks for the measurement of sound levels, which meets or exceeds the requirements for type S2A meters in American National Standards Institute (ANSI) specifications for sound level meters, SI.4-1971, or the most recent revision thereof.

J. "Vibration perception threshold" means the minimum ground or structure borne vibrational motion necessary to cause a normal person to be aware of the vibration by such direct means as, but not limited to, sensation by touch or visual observation of moving objects. A motion velocity 0.01 inches per second over the range of 1 to 100 hz shall create a rebuttable presumption that the vibration perception threshold has been met.

(Prior code §5-13-1)

8.20.020 - Exterior noise limits.

A. Maximum Permissible Sound Levels By Receiving Land Use.

1. No person shall operate or cause to be operated any source of sound at any location within the city or allow the creation of any noise on property owned, leased or occupied or otherwise controlled by such person, which causes the noise level when measured on any other property to exceed:
   a. The exterior noise limit for that land use or zone as specified in Table 1 or Table 2 for a cumulative period of more than thirty minutes in any hour; or
   b. The exterior noise limit for that land use or zone as specified in Table 1 or Table 2 plus 5 dbA for a cumulative period of more than fifteen minutes in any hour; or
   c. The exterior noise limit for that land use or zone as specified in Table 1 or Table 2 plus 10 dbA for a cumulative period of more than five minutes in any hour; or
   d. The exterior noise limit plus 15 dbA for a cumulative period of more than one minute in any hour; or
   e. The exterior noise limit for that land use or zone as specified in Table 1 or Table 2 plus 20 dbA for any period of time.
2. In the event the alleged offensive noise contains a steady , audible tone such as a whine, screech, or hum, or it is a repetitive noise such as a hammering or riveting, or contains music or speech conveying informational content, the exterior noise limits set forth in Tables 1 and 2 shall be reduced by 5 dbA.
3. If the measured ambient noise level exceeds that permissible within any of the first four noise limit categories above, the allowable noise limits set forth in Table 1 or 2 shall be adjusted in 5 dbA increments in each category as appropriate to encompass or reflect the ambient nose level. In the event the ambient noise level exceeds the fifth noise limit category, the exterior noise limit under the fifth category shall be increased to reflect the maximum ambient noise level.
4. Noise Measurement Procedure. The noise level shall be measured as a position or positions at any point on the receivers property utilizing the A~weighting scale of the sound level meter and the "slow" meter response for non-impulsive type noises and "fast" response for impulsive type sounds. When feasible, the microphone shall be located approximately four to five feet above the ground and ten feet or more from the nearest reflective surface. In those cases where the standard elevation is not feasible, the most closely approximate elevation possible shall be utilized. Calibration of the measurement equipment, utilizing an acoustical calibrator, shall be performed immediately prior to recording any noise data.

TABLE 1

EXTERIOR NOISE LIMITS BY ZONE

RECEIVING LAND ZONING CATEGORY	TIME PERIOD	NOISE LEVEL STANDARD (dbA)
One or Two Family Residential Zone	10 p.m.--7 a.m. 7 a.m.--10 p.m.	45 55
Multiple Dwelling Residential Zone, Public Zone	10 p.m.--7 a.m. 7 a.m.--10 p.m.	50 60
Commercial Zone or Commercial-Manufacturing Zone	10 p.m.--7 a.m. 7 a.m.--10 p.m.	55 60
Manufacturing Zone	Any time	70

TABLE 2

EXTERIOR NOISE LIMITS BY USE

RECEIVING LAND ZONING CATEGORY	TIME PERIOD	NOISE LEVEL STANDARD (dbA)
Property Partially or Entirely Developed for One or Two Family Residential Uses	10 p.m.--7 a.m.	45
Property Partially or Entirely Developed for Multi-Family Residential Uses	10 p.m.--7 a.m.	50

B. Vibration. No person shall operate or permit the operation of any device or machine that creates a vibration above the vibration perception threshold when measured at or beyond the property boundary of the source.

(Ord. 742 §1, 1985; prior code §5-13-2)

8.20.030 - Prohibited acts.

A. No person shall offer for sale, sell, or advertise by shouting or outcry within any residential or commercially developed portion of the city. The provisions of this section shall not be construed to prohibit the selling by outcry of merchandise, food and beverages at licensed sporting events, parades, fairs, circuses or other similar licensed public entertainment.

B. No person shall permit any animal owned or possessed by that person frequently or for extended

periods of time to make any sound or sounds which create a noise disturbance across a residential or commercial real property line.

C. No person shall load, unload, open, close or handle boxes, crates, containers, building materials, metal, equipment or other objects or personal property between the hours of ten p.m. and seven a.m. in such manner as to cause a noise disturbance across the real property line of an adjacent or nearby property developed entirely or partially for residential use.

D. No person shall operate or cause or authorize the operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work between the hours of ten p.m. and seven a.m., or at any time on weekends or holidays, such that the sound therefrom creates a noise disturbance across the real property line of an adjacent or nearby property developed entirely or partially for residential use.

E. No person shall sound or permit the sounding of any electronically amplified signal from any stationary bell, chime, siren, whistle, or similar device, for more than ten seconds in any hourly period. Houses of religious worship shall be exempt from this provision.

F. No person shall intentionally sound or authorize the sounding outdoors of any fire, burglar, or civil defense alarm, siren, whistle, or similar stationary emergency signaling device, except for emergency or testing purposes.

G. No person shall test a stationary emergency signaling device before seven a.m. or after seven p.m. nor test any such device for more than sixty seconds.

H. No person shall operate or permit the operation of any mechanically powered saw, sander, drill, grinder, lawn or garden tool, or any tool involved in any manufacturing process, so as to create a noise disturbance across a real property boundary line of property developed entirely or partially for residential use.

I. No person shall operate any motor, machinery or pump including, but not limited to, swimming pool equipment or any machinery involved in any manufacturing process, so as to create a noise disturbance across a real property boundary line of property developed entirely or partially for residential uses.

J. No person shall operate or permit the operation of any loudspeaker, musical instrument, motorized racing vehicle, or other source of sound in any place of public entertainment that exceeds 95 dbA as read on the slow response of a sound level meter at any point normally occupied by a customer, without a conspicuous and legible sign stating: "WARNING! SOUND LEVELS WITHIN MAY CAUSE HEARING IMPAIRMENT."

K. No person shall operate or permit the operation of any air conditioning or air handling equipment in such a manner as to exceed the following sound levels:

MEASUREMENT LOCATION	UNITS MFG. BEFORE 1-1-80 dbA	UNITS MFG. ON OR AFTER 1-1-80 dbA

Any point on neighboring property line, 5 feet above grade level, no closer than 3 feet to any wall	60	55
Center of neighboring patio, 5 feet above grade level, no closer than 3 feet to any wall	55	50
Outside the neighboring living area window nearest the equipment location, not more than 3 feet from the window opening, but at least 3 feet from any other surface	55	50

L. No person shall repair, rebuild, modify or test any motor vehicle, motorboat or aircraft in such a manner as to create a noise disturbance across a residential real property line. Nothing in this section shall be

construed to prohibit the movement of aircraft which are in all respects conducted in accordance with, or pursuant to, applicable federal laws or regulations.

M. No person shall operate or permit the operation of any motor vehicle with a gross vehicle weight rating (GVWR) in excess of ten thousand pounds, or any auxiliary equipment attached to such a vehicle, for a period longer than fifteen minutes in any hour while the vehicle is stationary, for reasons other than traffic congestion, on a public right-of-way or public space within one hundred fifty feet (forty-six meters) of a residentially developed property between the hours of ten p.m. and seven a.m.

(Ord. 757 §1, 1985; Ord. 742 §2, 1985; prior code §5-13-3)

8.20.040 - Special provisions.

A. Emergency Exemption. The provisions of this chapter shall not apply to:

1. The emission of sound for the purpose of alerting persons to the existence of an emergency threatening life or property, or
2. The emission of sound in the performance of work necessary to be performed immediately to prevent or correct any emergency threatening life or property.

B. Special Exemption. The provisions of this chapter shall not preclude the construction, operation, maintenance and repairs of equipment, apparatus or facilities of park and recreation departments, public works projects, or essential public services and facilities, including those of public utilities subject to the regulatory jurisdiction of the Public Utilities Commission.

C. Warning Devices. Warning devices necessary for the protection of public safety, including, but not limited to, police, fire and ambulance sirens, and train horns, shall be exempted from the provisions of this chapter when used for warning purposes.

D. Outdoor Activities. The provisions of this chapter shall not apply to occasional outdoor gatherings, public dances, shows and sporting and entertainment events, provided these events are conducted in compliance with all applicable ordinances, statutes, laws and regulations of all governmental agencies.

(Prior code §5-13-4)

CONSTRUCTION NOISE MODELING

Construction Equipment Noise Attenuation Calculations: KBH-02

Attenuation Calculation				
	RCNM Reference		Residential to North & South	
Phase	dBA Leq	distance (ft)	dBA Leq	distance (ft)
Asphalt/Building Demolition	84.6	50	68	335
On-site Reprocessing /Crush	77.9	50	61	335
Rough Grading	85.0	50	68	335
Utility Trenching	81.9	50	65	335
Paving	83.5	50	67	335
Building Construction	82.8	50	66	335
Architectural Coating	73.7	50	57	335

Attenuation Calculation				
	Reference Distance		Residential to East	
Phase	dBA Leq	distance (ft)	dBA Leq	distance (ft)
Asphalt/Building Demolition	84.6		66	450
On-site Reprocessing /Crush	77.9		59	450
Rough Grading	85.0		66	450
Utility Trenching	81.9	50	63	450
Paving	83.5		64	450
Building Construction	82.8		64	450
Architectural Coating	73.7		55	450

Attenuation Calculation				
	Reference Distance		Potrero School - Northeast	
Phase	dBA Leq	distance (ft)	dBA Leq	distance (ft)
Asphalt/Building Demolition	84.6		57	
On-site Reprocessing /Crush	77.9		50	
Rough Grading	85.0		57	
Utility Trenching	81.9	50	54	1200
Paving	83.5		56	
Building Construction	82.8		55	
Architectural Coating	73.7		46	

Attenuation calculated through Inverse Square Law: Lp(R2) = Lp(R1) - 20Log(R2/R1)

KBH-02	VdB		
Equipment	**FTA Reference Vibration Level**	**Residences to north**	**Potrero Intermediate School**
Feet	25	340	1200
Vibratory Roller	**94**	**60**	**44**
Large Bulldozer	**87**	**53**	**37**
Loaded Trucks	**86**	**52**	**36**
Jackhammer	**79**	**45**	**29**
Small Bulldozer	**58**	**24**	**8**

	PPV in/sec	
Equipment	**FTA Reference Vibration Level**	**Residential to north**
Feet	**25 feet**	**20**
Vibratory Roller	0.21	0.004
Large Bulldozer	0.089	0.002
Loaded Trucks	0.076	0.002
Jackhammer	0.035	0.001
Small Bulldozer	0.003	0.000

TRAFFIC NOISE INCREASE CALCULATIONS

KBH-02

Traffic Noise Calculations

	ADT Volumes				dBA CNEL Increae	
Roadway Segment	Existing No Project	Existing Plus Project	Future No Project	Future Plus Project	Project Noise Increase	Cumulative Increase
Rosemead Blvd- Garvey Avenue to Fern Street	53,360	53,901	53,810	54,351	0.0	0.1
Rosemead Blvd - Fern Street to Project Entrance	52,140	52,681	52,780	53,321	0.0	0.1
Rosemead Blvd – Project Entrance to Rush Street	50,240	51,054	50,880	51,694	0.1	0.1
Garvey Ave- Rosemead Boulevard to Chico Avenue	21,980	22,074	22,100	22,194	0.0	0.0
Garvey Ave - east of Chico Avenue	21,840	22,123	22,100	22,383	0.1	0.1
Chico Ave - Garvey Avenue to Fern Street	4,020	4,422	4,020	4,422	0.4	0.4
Chico Ave – Project entrance to Rush Street	4,020	4,149	4,020	4,149	0.1	0.1
Rush Street east of Chico Avenue	11,600	11,789	11,600	11,789	0.1	0.1
Rush Street west of Chico Avenue	12,960	13,019	12,960	13,019	0.0	0.0
Fern Street – Chico avenue to Potrero Avenue	2,370	2,464	2,370	2,464	0.2	0.2
Potrero Ave – Fern Street to Garvey	3,830	3,924	3,830	3,924	0.1	0.1
Potrero Ave – Rush Street to Fern Street	4,030	4,030	4,030	4,030	0.0	0.0
Max Increase	-	-	-	-	0.4	0.4