Appendix B Noise Analysis

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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).

- **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.

Lemon Grove, California Municipal Code

Title 9 PUBLIC WELFARE AND ELECTIONS

Chapter 9.24 NOISE ABATEMENT AND CONTROL

Article I. General Provisions

9.24.010 Purpose and intent.

The city council finds and declares that:

A. Inadequately controlled noise presents a growing danger to the health and welfare of the residents of the city;

B. The making and creating of disturbing, excessive, offensive or unusually loud noises within the jurisdictional limits of the city is a condition which has persisted and the level and frequency of occurrence of such noises continue to increase;

C. The making, creation or continuance of such excessive noises which are prolonged or unusual in their time, place, and use affect and are a detriment to the public health, comfort, convenience, safety, welfare, and prosperity of the residents of the city;

D. Every person is entitled to an environment in which the noise is not detrimental to his or her life, health, and enjoyment of property; and

E. The necessity in the public interest for the provisions and prohibitions contained and enacted in this chapter is declared to be a matter of legislative determination and public policy, and it is further declared that the provisions and prohibitions contained and enacted in this chapter are in pursuance of and for the purpose of securing and promoting the public health, comfort, convenience, safety, welfare, prosperity, peace and quiet of the city and its inhabitants. (Prior code § 36.401)

9.24.020 Definitions.

Whenever the following words and phrases are used in this chapter, unless otherwise defined herein, they shall have the meaning ascribed to them in this section:

A. “Average sound level” means a sound level typical of the sound levels at a certain place during a given period of time, averaged by the general rule of combination for sound levels, said general rule being set forth in American National Standard Specifications for Sound Level Meters § 1.4-1971. “Average sound level” also means equivalent continuous sound level.

B. “Commercial purpose” means and includes the use, operation or maintenance of any sound amplifying equipment for the purpose of advertising any business, or any goods, or any services, or for the purpose of attracting the attention of the public to, or advertising for, or soliciting patronage of customers to or for any performance, show, entertainment, exhibition, exhibition, or event, or for the purpose of demonstrating sound equipment.

C. “Construction equipment” means any tools, machinery or equipment used in connection with construction operations, including all types of special construction equipment as defined in the pertinent sections of the California Vehicle Code when used in the construction process on any construction site, regardless of whether such construction site be located on-highway or off-highway.

D. “Container” means any receptacle, regardless of contents, manufactured from wood, metal, plastic paper, or any other material, including, but not limited to, any barrel, basket, box, crate, tub, bottle, can or refuse container.

E. “Decibel” means a unit of measure of sound (noise) level.

F. “Disturbing, excessive or offensive noise” means:

1. Any sound or noise which constitutes a nuisance involving discomfort or annoyance to persons of normal sensitivity residing in the area;

2. Any sound or noise conflicting with criteria standards, or levels as set forth in this chapter for permissible noises;

3. Any sound or noise conflicting with criteria standards or levels established for Federal or State Government which are applicable in the county.

G. “Emergency work” means work made necessary to restore property to a safe condition following a public calamity, or work required to protect persons or property from imminent exposure to danger or damage or work by public or private utilities when restoring utility service.

H. “Fixed source” means a machine or device capable of creating a noise level at the property upon which it is regularly located, including, but not limited to: Industrial and commercial process machinery and equipment, pumps, fans, air-conditioning apparatus or refrigeration machines.

I. “Motor vehicles” means any and all self-propelled vehicles as defined in the California Vehicle Code and shall specifically include, but not be limited to, mini-bikes and go-carts.

J. “Noise level” means sound level, and the terms may be used interchangeably herein.

K. “Noncommercial purpose” means the use, operation, or maintenance of any sound equipment for other than a commercial purpose. “Noncommercial purpose” means and includes, but shall not be limited to, philanthropic, political, patriotic, and charitable purposes.

L. “Nonstationary source” means a machine or device capable of being moved from place to place for occasional or temporary use at a given location, including, but not limited to, powered and manual construction equipment not used in connection with construction operations, powered lawn mowers, chain saws and soil tillers, but excluding motor vehicles.

M. “Person” means a person, firm, association, co-partnership, joint venture, corporation, or any entity, public or private.

N. “Powered model vehicles” means but shall not be limited to, airborne, waterborne, or landborne vehicles such as model airplanes, model boats, and model vehicles of any type or size which are not designed for carrying persons or property and which can be propelled in any form other than manpower or windpower.

O. “Sound amplifying equipment” means any machine or device, mobile or stationary, used to amplify music, the human voice, or any sound.

P. “Sound level” (noise level) means in decibels the quantity measured using the frequency weighting-A of a sound level meter as defined in subsection Q of this section.

Q. “Sound level meter” means an instrument for the measurement of sound which meets or exceeds the specifications contained in the most current edition of the American National Standard Specifications for Sound Level Meter.

R. “Sound truck” means any motor vehicle or other vehicle, regardless of motive power, whether in motion or stationary, having mounted thereon, built-in, or attached thereto any sound amplifying equipment other than a car radio or television.

S. Supplementary Definitions of Technical Terms. Definitions of technical terms not defined in this chapter shall be obtained from the most current edition of the American National Standard, Acoustical Terminology. (Ord. 190, 1991)

9.24.030 Exemptions.

A. Emergency Work. The provisions of this chapter shall not apply to any emergency work as defined in Section 9.24.020(H); provided, that:

1. The director of community development has been notified in advance, if possible, or as soon as practical after said emergency; and

2. Any vehicle, device, apparatus, or equipment used, related to or connected with emergency work, is designed, modified, or equipped to reduce sounds produced to the lowest possible level consistent with effective operation of such vehicle, device, apparatus or equipment.

B. Sporting, Entertainment, Public Events. The provisions of this chapter shall not apply to:

1. Those reasonable sounds emanating from authorized school bands, school athletic and school entertainment events;

2. Sporting, entertainment and public events which are conducted pursuant to a license or permit issued by the city, for which noise has been a consideration.

3. Those reasonable sounds emanating from a sporting, entertainment, or public event; provided, however, it is unlawful to exceed those levels set forth in Section 9.24.080 when measured at or within the property lines of any property which is developed and used either in part or in whole for residential purposes, unless a variance has been granted allowing sounds in excess of said levels. (Ord. 190, 1991)

9.24.040 Display of permits.

Any permit, certificate, or other notice required herein shall be displayed or maintained on the premises designated thereon. (Prior code § 36.423)

9.24.050 Enforcement.

The community development director or his designee shall have primary responsibility for the enforcement of this chapter. (Ord. 190, 1991)

9.24.060 Violations—Additional remedies.

As an additional remedy, the operation or maintenance of any device, instrument, vehicle, machinery, or other item in violation of any provision of this chapter for which operation or maintenance causes discomfort or annoyance to persons of normal sensitivity, or which endangers the comfort, repose, health, or peace of residents in the area, shall be deemed and is declared to be a public nuisance and shall be subject to abatement summarily by a restraining order or injunction issued by a court of competent jurisdiction. (Prior code § 36.420)

Article II. Sound Level Requirements

9.24.070 Measurement.

A. Any sound or noise level measurement made pursuant to the provisions of this chapter shall be measured with a sound level meter using the A-weighting and slow response pursuant to applicable manufacturer's instructions; except, that for sounds of a duration of two seconds or less, the fast response shall be used and the average level during the course of the occurrence of the sound reported.

B. The sound level meter shall be appropriately calibrated and adjusted as necessary by means of an acoustical calibrator of the coupler-type to assure meter accuracy within the tolerances set forth in the most current standards for sound level meters.

C. For outside measurements, the microphone shall be not less than four feet above the ground, at least four feet distant from walls or other large reflecting surfaces, and shall be protected from the effects of wind noises by the use of appropriate wind screens, and the location selected shall be at any point on the affected property. In cases when the microphone must be located within ten feet of walls or similar large reflecting surfaces, the actual measured distances and orientation of sources, microphone and reflecting surfaces shall be noted and recorded. In no case shall a noise measurement be taken within five feet of the noise source.

D. For inside measurements, the microphone shall be at least three feet distant from any wall, ceiling or partition, and the average measurement of at least three microphone positions throughout the room shall be determined. (Ord. 190, 1991; prior code § 36.403)

9.24.080 Fixed and nonstationary sources.

A. Unless a variance has been applied for and granted pursuant to this chapter, it is unlawful for any person to operate, or cause to be operated, any single or combination of fixed source or nonstationary source type of equipment or machinery, except construction equipment used in connection with construction operations, that individually or collectively constitutes an identifiable sound source, in such a manner as to cause the average sound level at any point on or beyond the boundaries of the property on which the sound is produced to exceed by five decibels the noise level limits set forth in subsection B of this section, plus allowances for time duration in subsection C of this section.

B. Zone Ambient Noise Level Limits. "Noise level limit" or "sound level limit" referred to in this section means that noise level limit as determined from the table below:

Zone	Time	Avg. Sound Level
RL, RL/M, RM	7 AM to 7 PM	50
	7 PM to 10 PM	45
	10 PM to 7 AM	40
RM/H, RP	7 AM to 7 PM	60
	7 PM to 10 PM	55
	10 PM to 7 AM	50
All Commercial Zones	7 AM to 7 PM	60
	7 PM to 10 PM	55
	10 PM to 7 AM	55
LI	Anytime	70

The sound level limit at a location on a boundary between two zoning districts shall be the arithmetic mean of the respective limits for the two districts. Fixed location public utility distribution or transmission facilities located on adjacent to a property line shall be subject to noise level limits of this section, measured at or beyond six feet from the boundary of the easement upon which the equipment is located.

C. Time Duration Correction Table. The time duration allowances set forth in the table below shall apply to those noise level limits set forth in subsection B of this section.

Allowances for Sound Levels Lasting Less Than an Hour

Duration	Allowable Decibels
Up to 30 minutes per hour (50%)	+3
Up to 15 minutes per hour (25%)	+6
Up to 10 minutes per hour (16%)	+8
Up to 5 minutes per hour (8%)	+11
Up to 2 minutes per hour (3%)	+15

D. Permissible construction noise level limits shall be governed by Section 9.24.120. (Ord. 190, 1991; prior code § 36.404)

9.24.090 Motor vehicles.

A. Repairs of Motor Vehicles. It is unlawful for any person within the city to repair, rebuild, or test any motor vehicle in such a manner as to cause disturbing, excessive, or offensive noises as defined in Section 9.24.020(F).

B. On-highway. Violations for exceeding applicable noise level limits as to persons operating motor vehicles on a public street or highway in the city shall be prosecuted under applicable California Vehicle Code provisions and under Federal Regulation adopted pursuant to 42 U.S.C. 4905 (a) (1) (A), (B), and (C) (ii), (iii) for which enforcement responsibility is delegated to local governmental agencies.

C. Off-highway. Except as otherwise provided for in this chapter, it is unlawful to operate any motor vehicle of any type on any site other than on a public street or highway as defined in the California Vehicle Code in a manner so as to cause noise in excess of:

1. Those noise levels permitted for on-highway motor vehicles as specified in the table “35 miles per hour or less speed limits” contained in Section 23130 of the California Vehicle Code and as corrected for distances set forth below:

Corrections

Distance (Feet)	Correction (Decibels)
25	-6
28	-5
32	-4
35	-3
40	-2
45	-1
50 (Preferred Distance)	0
56	+1
63	+2
70	+3
80	+4
90	+5
100	+6

A measured noise level thus calibrated to the lane-to-microphone distance of fifty feet shall be deemed in violation of this section if it exceeds the applicable noise-level limit specified by this section.

2. Or in excess of those sound levels permitted in Section 9.24.080.

D. Emergency Vehicles. Nothing in this section shall apply to authorized emergency vehicles when being used in emergency situations.

E. Urban Transit Buses. Buses as defined in the California Vehicle Code shall at all times comply with the requirements of this section. (Prior code § 36.405)

9.24.100 Powered model vehicles.

It is unlawful for any person to operate any powered model vehicle except between the hours of seven a.m. and nine p.m. and then only in such a manner so as not to emit noise in excess of those levels set forth in Section 9.24.080; however, if powered model vehicles are operated in public parks at a point more than one hundred feet from the property line, the noise level shall be determined at a distance of one hundred feet from the noise source instead of at the property line, and noises from powered model vehicles, measured at that distance in excess of the noise limits specified in Section 9.24.080, are prohibited. (Prior code § 36.406)

9.24.110 Refuse vehicles.

No person shall operate, or permit to be operated, a refuse compacting, processing, or collection vehicle within the city which, when compacting, creates a sound level in excess of eighty decibels when measured at a distance of fifty feet from any point of the compacting vehicle, unless a variance has been applied for and granted pursuant to this chapter. (Prior code § 36.407)

9.24.120 Construction equipment.

A. Except for emergency work, it is unlawful for any person, including the city, to operate any single or combination of powered construction equipment at any construction site, except as outlined below:

1. It is unlawful for any person, including the city, to operate any single or combination of powered construction equipment at any construction site on Sundays on any day celebrating official state holidays. Notwithstanding the above, a person may operate powered construction equipment on the above-specified days between the hours of ten a.m. and five p.m. in compliance with subdivision 2 of this subsection at his residence or for the purpose of constructing a residence for him or herself, provided such operation of powered construction is not carried on for profit or livelihood. In addition, it is unlawful for any person to operate any single or combination of powered construction equipment at any construction site on Mondays through Saturdays except between the hours of seven a.m. and seven p.m.

2. No such equipment, or combination of equipment, regardless of age or date of acquisition, shall be operated so as to cause noise at a level in excess of seventy-five decibels for more than eight hours during any twenty-four hour period when measured at or within the property lines of any property which is developed and used either in part or in whole for residential purposes. These sound levels shall be corrected for time duration in accordance with the following table:

Total Duration in 24 Hours	Decibel Level Allowance	Total Decibel Level
Up to 15 minutes	+15	90
Up to 30 minutes	+12	87
Up to 1 hour	+9	84
Up to 2 hours	+6	81
Up to 4 hours	+3	78
Up to 8 hours	0	75

B. In the event that lower noise limit standards are established for construction equipment pursuant to state or federal law, said lower limits shall be used as a basis for revising and amending the noise level limits specified in subsection A(2) of this section. (Ord. 190, 1991)

9.24.130 Containers and construction material.

It is unlawful for any person to handle or transport, or cause to be handled or transported, in any public place, any container or any construction material in such a way as to create a disturbing, excessive, or offensive noise as defined under Section 9.24.020(F). (Prior code § 36.411)

9.24.140 Signal device for food trucks.

No person shall operate, or cause to have operated or used, any sound signal device, other than sound-amplification equipment, attached to a motor vehicle wagon or manually propelled cart from which food or any other items are sold which emits a sound signal more frequently than once every ten minutes in any one street block and with a duration of more than ten seconds for any single emission. The sound level of this sound signal shall not exceed ninety decibels at fifty feet. (Prior code § 36.412)

9.24.150 Multiple-family dwelling units.

Notwithstanding any other provisions of this chapter, it is unlawful for any person to create, maintain, or cause to be maintained, any sound within the interior of any multiple-family dwelling unit which causes the average sound level of forty-five decibels to be exceeded in any other dwelling unit for a cumulative period of five minutes in any one hour, or fifty decibels for a cumulative period of one minute in any one hour, or fifty-five decibels at no time between the hours of ten p.m. of one day and seven a.m. of the following day. The monitoring procedures outlined under Section 9.24.070 shall be followed in enforcing this section. (Prior code § 36.413)

Article III. General Noise Regulations

9.24.160 Disturbing, excessive or offensive noises—Prohibited—Characteristics and conditions.

A. In the absence of objective measurement by use of a sound level, meter, additionally it is unlawful for any person to make, continue, or cause to be made or continued, within the limits of the city any disturbing, excessive or offensive noise which causes discomfort or annoyance to reasonable persons of normal sensitivity residing in the area.

B. The characteristics and conditions which should be considered in determining whether a violation of the provisions of this section and Section 9.24.170 exists, include, but are not limited to, the following:

1. The level of the noise;

2. Whether the nature of the noise is usual or unusual;

3. Whether the origin of the noise is natural or unnatural;

4. The level of the background noise;

5. The proximity of the noise to sleeping facilities;

6. The nature and zoning of the area within which the noise emanates;

7. The density of the inhabitation of the area within which the noise emanates;

8. The time of day or night the noise occurs;

9. The duration of the noise;

10. Whether the noise is recurrent, intermittent, or constant; and

11. Whether the noise is produced by a commercial or noncommercial activity. (Prior code § 36.414(a))

9.24.170 Disturbing, excessive or offensive noises—Certain acts enumerated.

The following acts, among others, are declared to be disturbing, excessive and offensive noises in violation of this section and Section 9.24.160, but said enumeration shall not be deemed to be exclusive, namely:

A. Horns, Signaling Devices, etc. Violations for disturbing, excessive or offensive noises associated with the use or operation of horns, signaling devices, etc., on automobiles, motorcycles, or any other vehicle, except as provided in Section 9.24.140, shall be prosecuted under applicable provisions of the California Vehicle Code.

B. Radios, Television Sets, Phonographs, and Similar Devices.

1. Uses Restricted. The use, operation, or permitting to be played, used or operated, any radio receiving set, musical instrument, phonograph, television set, or other machine or device for the producing or reproducing of sound in such manner as to disturb the peace, quiet and comfort of neighboring residents or persons of normal sensitivity residing in the area are declared to be disturbing, excessive or offensive noises.

2. Prima Facie Violations. The operation of any such set, instrument, phonograph, television set, machine or similar device between the hours of ten p.m. and eight a.m. in such a manner as to be plainly audible at a distance of fifty feet from the building, structure or vehicle in which it is located, shall be prima facie evidence of a violation of this section and Section 9.24.160.

C. Loudspeaking Amplifiers for Advertising. The use, operation, or the permitting to be played, used or operated of any sound production or reproduction device or machine, including, but not limited to, radio receiving sets, phonographs, musical instruments, loudspeakers, and sound amplifiers, for commercial or business advertising purposes in, upon, over, or across any street, alley, sidewalk, park or public property in such a manner as to violate the provisions of this chapter is prohibited. This provision shall not be applicable to sound amplifying equipment mounted on any sound truck or vehicle for commercial or noncommercial purposes where the owner or operator complies with the following requirements:

1. The only sounds permitted are music or human speech.

2. Operations are permitted between the hours of eight a.m. and nine p.m., or after nine p.m. during public events and affairs of interest to the general public.

3. Sound amplifying equipment shall not be operated unless the sound truck upon which such equipment is mounted is operated at a speed of at least ten miles per hour, except when said truck is stopped by traffic the sound amplifying equipment shall not be operated for longer than one minute at each stop.

4. Sound shall not be issued within one hundred yards of hospitals, schools, churches, or courthouses.

5. The human speech and music amplified shall not be profane, lewd, indecent or slanderous.

6. The volume of sound shall be controlled so that said volume is not raucous, jarring, disturbing or a nuisance to persons within the area of audibility and so that the volume of sound shall not exceed a sound level of sixty-five decibels (on the A scale) at a distance of fifty feet from the sound amplifying equipment as measured by a sound level meter which meets the American National Standard ANSI S1.4-1971, or the latest revision thereof.

7. No sound amplifying equipment shall be operated unless the axis of the center of any sound reproducing equipment used is parallel to the direction of travel of the sound truck; provided, however, that any sound reproducing equipment may be so placed upon said sound truck as to not vary more than fifteen degrees from either side of the axis of the center of the direction of travel.

8. No sound truck with its amplifying device in operation shall be driven on the same street past the same point more than twice in a period of one hour.

D. Yelling, Shouting, etc. Disturbing or raucous yelling, shouting, hooting, whistling or singing on the public streets, particularly between the hours of ten p.m. and eight a.m., or at any time or place so as to annoy or disturb the quiet, comfort or repose of neighboring residents or persons of normal sensitivity within the area for whatever reason, is prohibited.

E. Hawkers and Peddlers. The shouting or crying out of any peddlers, hawkers and vendors which disturbs the peace and quiet of a neighborhood or persons of normal sensitivity is prohibited. This provision shall not be construed to prohibit the selling by outcry of merchandise, food and beverages at sporting events, parades, fairs, celebrations, festivals, circuses, carnivals and other similar special events for public entertainment.

F. Drums, Other Instruments. The use of any drum or other instrument or device of any kind for the purpose of attracting attention by the creation of noise within the city is prohibited. This provision shall not apply to any person who is a participant in a school band or legally authorized parade or who has been otherwise duly authorized by the county to engage in such conduct.

G. Animals and Fowl. The keeping or maintenance, or the permitting to be kept or maintained, upon any premises owned, occupied or controlled by any person of any animal or fowl which, by any frequent or long continued noise, causes annoyance or discomfort to persons of normal sensitivity in the vicinity is prohibited; provided, however, that nothing contained in this subsection shall be construed to apply to occasional noises emanating from legally operated dog and cat hospitals, humane societies, pounds, farm and/or agricultural facilities, or areas where keeping of animals or fowl is permitted. The written affirmation by two persons having separate residences that a violation of this section disturbs the peace and quiet of said persons shall be a prima facie evidence of a violation of this section and Section 9.24.160.

H. Schools, Courts, Churches, Hospitals. The creation of any noise on any street, sidewalk or public place adjacent to any school, institution of learning (except recreational areas of schools), church, court or library, while the same are in use; or adjacent to a hospital, rest home, or long-term medical or mental care facility, which noise interferes with the workings of such institution or which disturbs or annoys patients in the hospital, rest home, or long-term medical or mental care facility; provided, conspicuous signs are displayed in such streets, sidewalks or public places indicating the presence of a school, institution of learning, church, court, library, rest home or long-term medical or mental care facility, is prohibited.

I. Steam Whistles. The operation, use, or causing to be operated or used, any steam whistle attached to any stationary boiler is prohibited, except to give notice of the time to start or stop work or as a sound signal of imminent danger.

J. Engines and Motor Vehicles. Any disturbing or raucous noises caused off streets or highways by racing or accelerating the engine of any motor vehicle while moving or not moving, by the wilful backfiring of any engine and exhaust from the engine tailpipe or muffler, or from the screeching of tires, is prohibited. (Prior code § 36.414(b))

9.24.180 Burglar alarms.

A. Any building burglar alarm must have an automatic cutoff, capable of terminating its operation within thirty minutes of the time it is activated, unless such an alarm is located within an agricultural or estate zone. Notwithstanding the requirements of this provision, any member of the sheriff's department shall have the right to take such steps as may be reasonable and necessary to disconnect any such alarm during the period of its activation.

B. No owner of a motor vehicle shall have in operation an audible burglar alarm therein, unless such burglar alarm is capable of terminating its operation within fifteen minutes of the time it is activated. Notwithstanding the requirements of this provision, any member of the sheriff's department shall have the right to take such steps as may be reasonable and necessary to disconnect any such alarm installed on a motor vehicle at any time during the period of its activation.

C. Any motor vehicle upon which a burglar alarm has been installed shall, when parked on a public highway or parking lot open to the public, prominently display the telephone number at which communication may be made with the owner of such motor vehicle. (Prior code § 36.415)

Contact:

City Clerk: 619-825-3800

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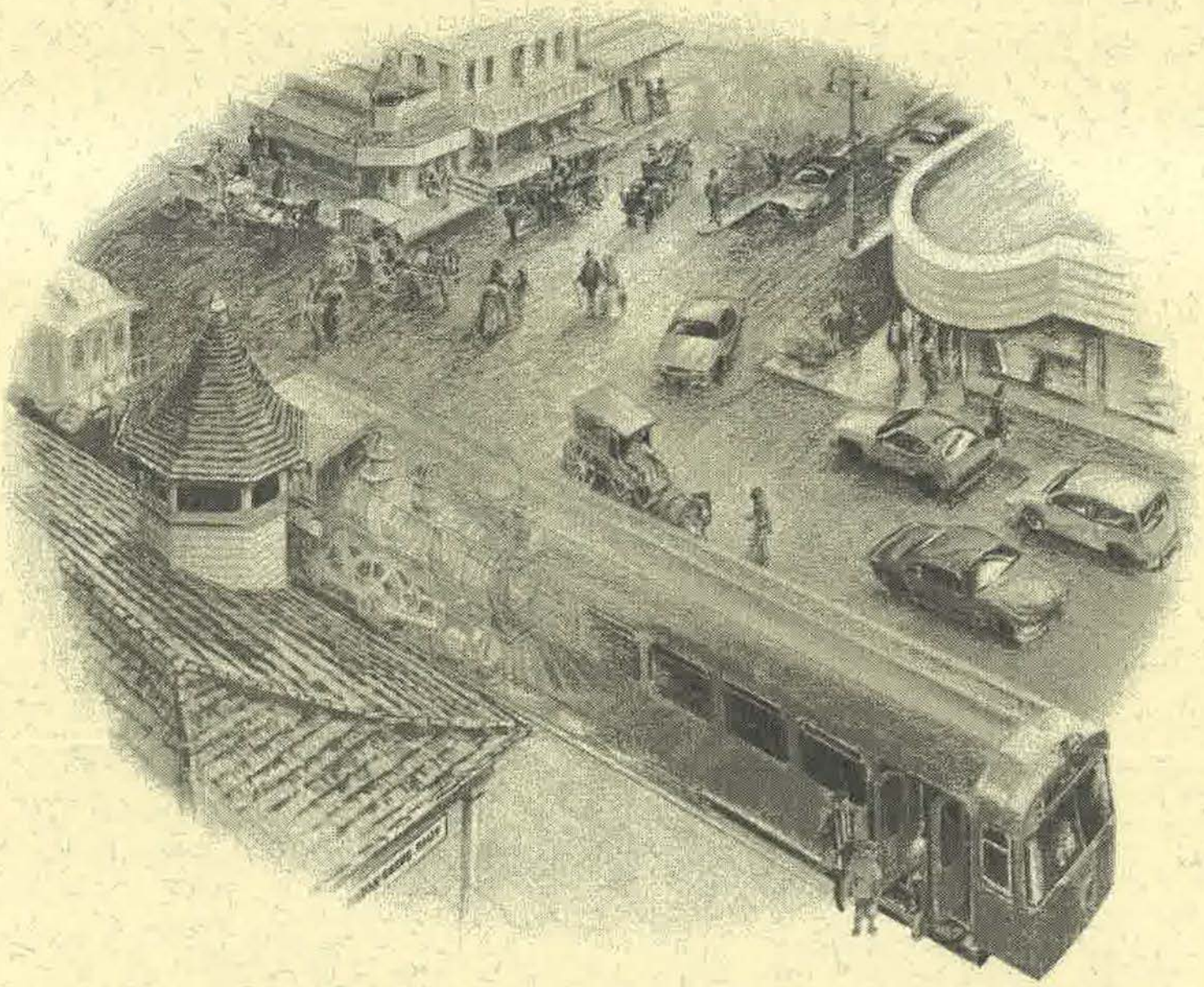

NOISE ELEMENT

Lemon Grove General Plan

Noise Element

INTRODUCTION

Implementing the Vision

The Vision for the Future calls for sustaining our small town feeling and protecting the established residential neighborhoods. Quiet, peaceful conditions contribute to the pleasant community we enjoy. Because traffic and active commercial and business centers can generate obtrusive noise, protecting the quiet environment requires careful, long-range planning.

Purpose

State planning law requires California cities to adopt specific elements in their general plans. The Lemon Grove Noise Element fulfills the state planning mandate for the noise element, as defined in the Government Code Section 65302(f) and Health and Safety Code Section 46050.1. The requirements for the noise element include estimating existing and future noise levels and establishing guidelines to minimize noise impacts to the community.

Scope

"...the plan to protect the community from noise and maintain quiet conditions."

The Noise Element establishes the plan to protect the community from noise and maintain quiet conditions. Noise is defined as unwanted sound and results from heavy traffic, commercial establishments, machinery, air conditioning systems, industrial operations and landscaping equipment. Noise patterns often reflect land use patterns. In Lemon Grove, noise is greatest around the SR-94 freeway and the Broadway commercial corridor, reflecting the concentration of transportation, commercial and light industrial uses. The Safety Element sets forth a plan to minimize the effect of noise on residences, schools, parks and other areas that need quiet environments.

The Noise Element is organized into three sections: 1) Introduction, 2) Objectives and Policies and 3) Plan. This Introduction explains the relationship between the element and the *General Plan* Vision for the Future, state planning requirements, and related plans and programs. In the section entitled Objectives and Policies, local noise issues are summarized and then objectives and policies addressing the issues follow. An *objective* represents the desired end point or goal while a *policy* signifies a broad, general rule or course of action to achieve the objective. All of the goals and objectives are extensions of the Vision for the Future.

INTRODUCTION

The Noise Plan - the final section of the element - directly builds on the objectives and policies. The plan describes the framework for achieving the objectives and policies and summarizes the programs that will protect the community from obtrusive noise and ultimately realize the Vision for the Future. Specific implementation measures for the Noise Element are provided in the *General Plan Implementation Manual*. All of the objectives and policies in this element are directly represented by one or more implementation programs.

Related Plans and Programs

California Environmental Quality Act (CEQA)

The California Environmental Quality Act (CEQA) of 1970 requires thorough analysis of the environmental impacts of proposed development, infrastructure and planning projects. Prior to approving a project, the CEQA process requires assessing potential environmental impacts and identifying mitigation measures to reduce the impacts to acceptable levels. Assessing and minimizing potential noise impacts is required by CEQA.

California Noise Insulation Standards (Title 24)

The California Noise Insulation Standards, (Title 24, Part 2, California Code of Regulations, often referred to as "Title 24"), establish an interior noise standard of 45 decibels or less (dB - CNEL or Ldn) for the interiors of residences. When residential development is proposed with noise contours of 60 dB or greater from freeways, expressways, parkways, major streets, thoroughfares, rail lines, rapid transit lines or industrial noise sources, an acoustical study must be prepared. The study must show that the building is designed to reduce the interior noise level to 45 dB or lower.

Lemon Grove Noise Abatement and Control Ordinance

The Lemon Grove Noise Abatement and Control Ordinance (Chapter 9.24 of the Municipal Code) regulates noise from a variety of sources and helps maintain quiet conditions. The ordinance regulates how much noise local activities can generate, and the allowable hours of operation of some noisy activities. Noise sources regulated by the ordinance include motor vehicles, trash trucks, powered model vehicles, construction equipment, food trucks and multiple-family dwelling units in addition to noise-producing activities such as the use of honking, loudspeakers, steam whistles, hawkers and peddlers, and barking dogs.

Planned SR-125 Freeway

Caltrans has finalized the environmental documentation and approved the construction of the State Route 125 (SR-125) freeway project. The new freeway will generally follow the existing path of Sweetwater Road, and comprise Lemon Grove's eastern boundary once completed. In the area of the existing intersection of Sweetwater Road and Broadway, an elevated interchange reaching 80 to 100 feet above the existing grade will connect the SR-125 to the existing SR-94 freeway. The Environmental Impact Report prepared for the freeway identifies significant noise impacts to Lemon Grove neighborhoods bordering the project corridor. Caltrans will primarily mitigate the impacts by constructing sound barriers. Freeway construction in the Lemon Grove area is scheduled to commence in mid-1988.

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Noise Element

OBJECTIVES AND POLICIES

Quiet Neighborhoods

Most of the neighborhoods in the City enjoy quiet and peaceful conditions. The established land use pattern with segregated commercial, light industrial, transportation and residential areas contributes to low noise levels in the neighborhoods.

Objective 1.0: Quiet and peaceful neighborhoods.

Policy 1.1: Maintain the existing land use pattern, where the established neighborhoods are generally separated from activities that generate noise.

Policy 1.2: Limit new multi-family residential development in the established neighborhoods.

Policy 1.3: Work to stabilize traffic volumes in the neighborhoods.

Transportation Noise

Noise is generated by the transportation corridors in and around the City, particularly the SR-94 freeway, Broadway and the trolley. The planned SR-125 freeway will increase noise levels in the eastern part of the City.

Objective 2.0: Protection of residential and public areas from transportation noise.

Policy 2.1: Avoid residential uses near major transportation corridors unless interior noise levels can be reduced to acceptable levels.

Policy 2.2: Pursue construction of noise barriers along the freeway to protect residential areas.

Policy 2.3: Monitor appropriate noise mitigation for the SR-125 freeway.

Policy 2.4: Encourage enforcement of vehicle noise standards and speed limits.

Policy 2.5: Promote reduction of unnecessary trolley noise.

Downtown Village and Massachusetts Station

The Downtown Village and Massachusetts Station are planned for a mix of shops and stores, restaurants, office, condominium and apartment buildings.

Objective 3.0: Quiet living areas for residents of the Downtown Village and Massachusetts Station.

Policy 3.1: In mixed use areas, plan for acceptable interior noise levels.

Other Noise Sources

Noise is also generated by other sources, such as construction operations, commercial and industrial activities, and loud music. These sources of noise are often referred to as "stationary" sources.

Objective 4.0: Minimal intrusions from stationary noise sources.

Policy 4.1: Locate new noise-generating uses away from sensitive uses, such as residences and schools.

Policy 4.2: Enforce noise ordinances and update as necessary to address new noise concerns.

Noise Element

PLAN

Overview

The Noise Plan sets forth strategies to maintain quiet and peaceful conditions and control exposure to noise. An explanation of noise characteristics is followed by a description of existing and future noise conditions and specific noise-reduction strategies.

Definitions and Standards

Sound and Noise Measurements

Sound consists of mechanical energy transmitted by pressure waves in a compressible medium such as air, and noise is defined as unwanted sound. Parameters that characterize sound include the rate of oscillation of sound waves, distance between successive troughs or crests, the speed of propagation, and the pressure level or energy content of sound. The sound pressure level has become the most common descriptor of loudness.

"...noise is defined as unwanted sound ...The decibel (dB) scale quantifies the sound intensity..."

The decibel (dB) scale quantifies the sound intensity or loudness. Because sound pressure can vary millionfold within the range of human hearing, the dB scale consists of a logarithmic progression very similar to the Richter Scale used for earthquake magnitude. Because the human ear is more sensitive to some sound frequencies more than others, sound descriptions are weighted in a process called "A-weighing," written as dB(A). In A-weighing, the middle A and its higher harmonics are weighted reflecting humans increased sensitivity to this range. Because people are also more sensitive to unwanted noise during the evening at night, state planning law requires adding an artificial dB increment to quiet time noise levels in a 24-hour noise descriptor, called the Community Noise Equivalent Level (CNEL). In practical terms, the CNEL measures the average sound occurring in a given area over a 24-hour period.

Noise Conditions

In Lemon Grove, noise is primarily caused by traffic on the SR-94 freeway and local roadways. The commercial and light industrial activity on Federal Boulevard and Broadway in addition to the trolley also incrementally contribute to local noise levels. Noise levels can be

Lemon Grove Rodeo billboard (held at St. John's Church), circa 1954. Photo courtesy of Lemon Grove Historical Society.

"In Lemon Grove, noise is primarily caused by traffic on the SR-94 freeway and local roadways."

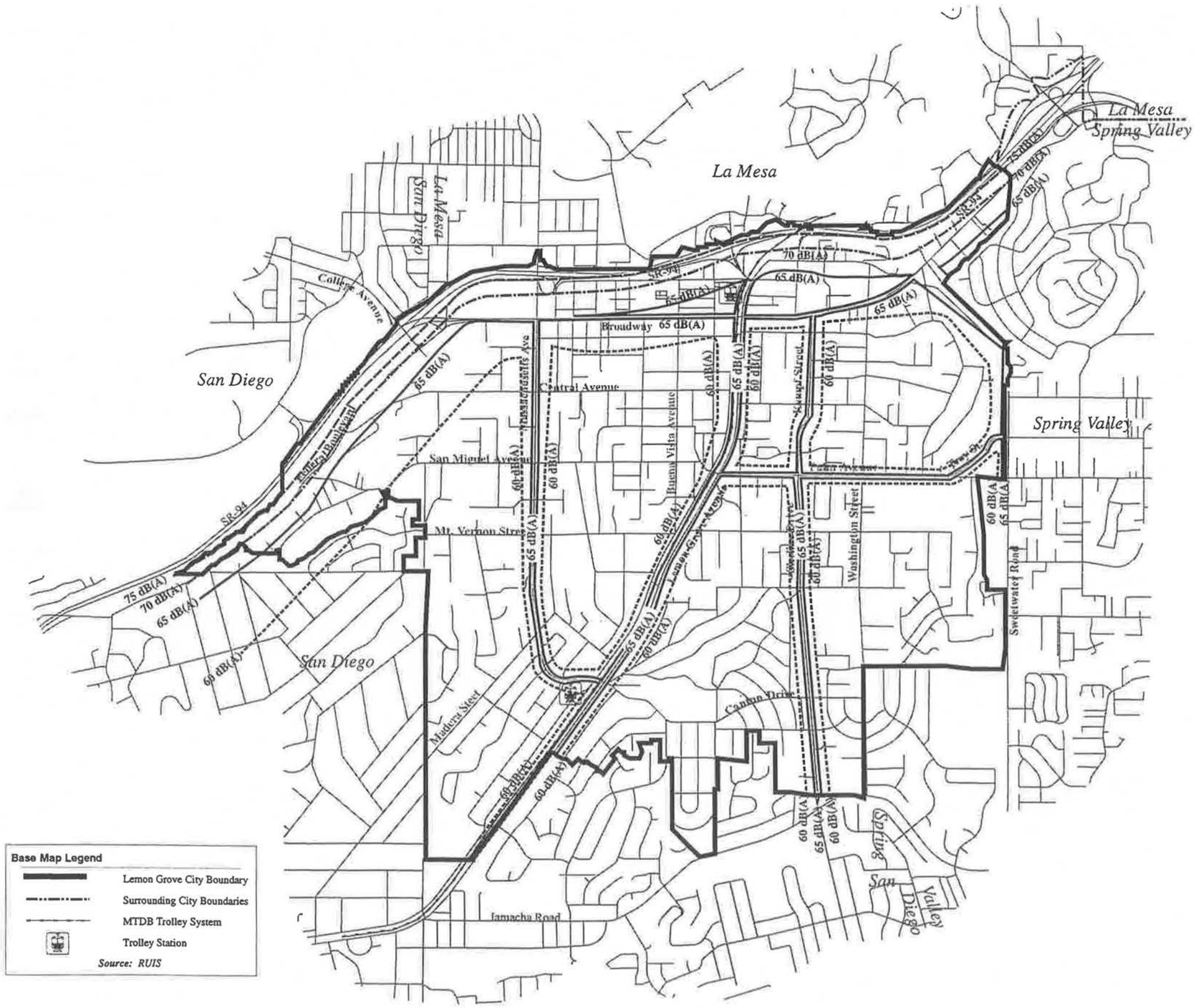
estimated based on traffic volumes and represented as "noise contours." A noise contour indicates the area subject to a particular volume of noise. For example, the area between the 65-dB and 70-dB contour is subject to noise ranging between 65 and 70 dBs.

Figure N-1 shows the estimated noise contours in 1995 while Figure N-2 shows the expected contours for 2015. Greater areas in the northern part of the City will be affected by noise in the 65 dB(A), 70 dB(A) and 75 dB(A) levels in the future and neighborhoods in the eastern part of the City will also experience greater noise. The greater extent of the 2015 contours reflects anticipated increases in traffic volumes on SR-94 and local roads in addition to operation of the planned SR-125 freeway and elevated SR-125/SR-94 interchange.

Noise Planning and Standards

For planning purposes, land uses that generate noise are distinguished from uses that are particularly sensitive to noise. Noise sources include

Noise Element



Legend

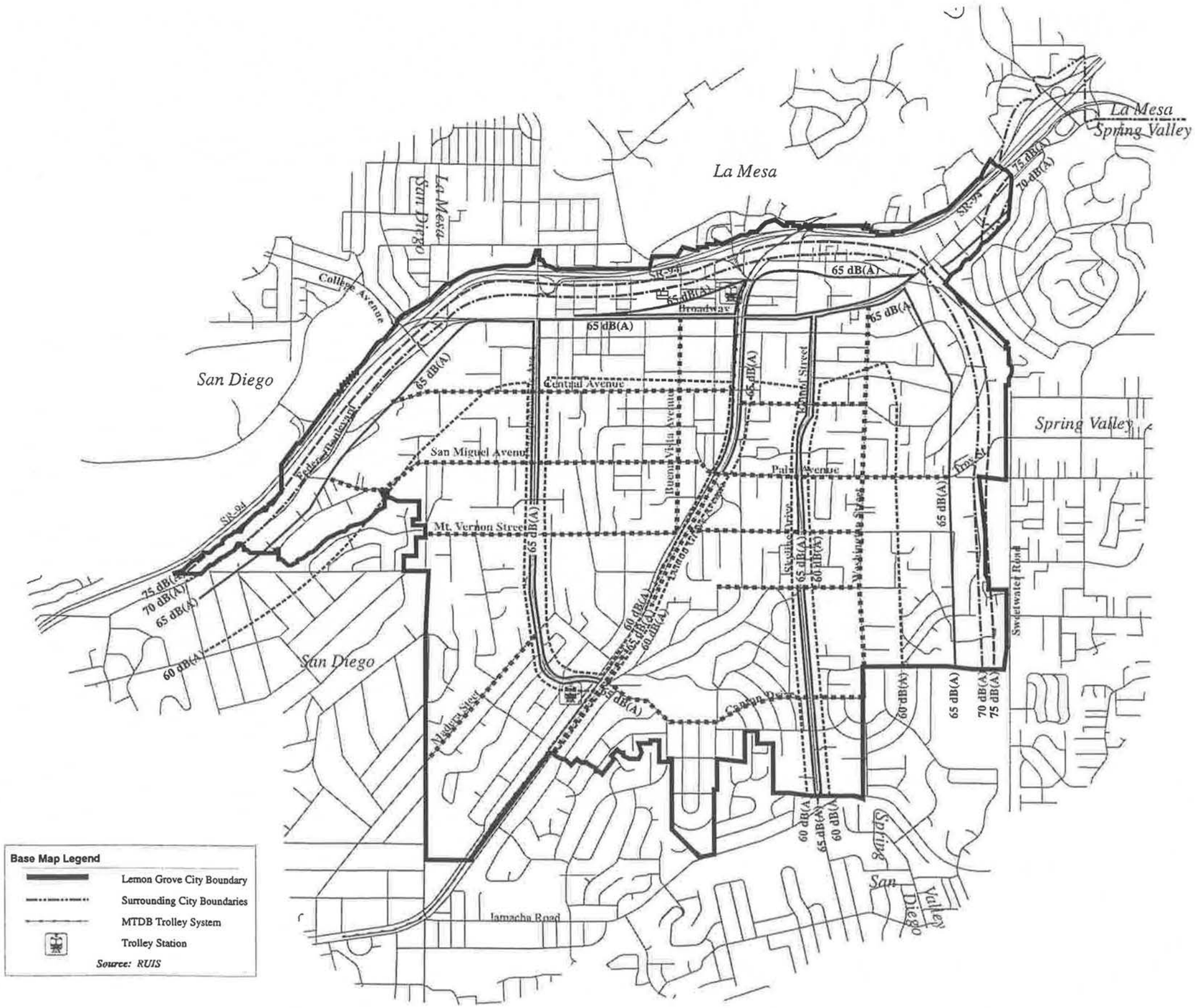
- - - - - 60 dB(A) CNEL
——— 65 dB(A) CNEL
—·—·— 70 dB(A) CNEL
— — — 75 dB(A) CNEL

Source: Giroux & Associates, 1995

N

1 inch = 2,000 feet

Figure N-1
1995 Noise Contours



Legend

- 60 dB(A) CNEL
- 65 dB(A) CNEL
- 65 dB(A) CNEL (<50' to Centerline)
- 70 dB(A) CNEL
- 75 dB(A) CNEL

Source: Giroux & Associates, 1995

N

1 inch = 2,000 feet

Figure N-2
2015 Noise Contours

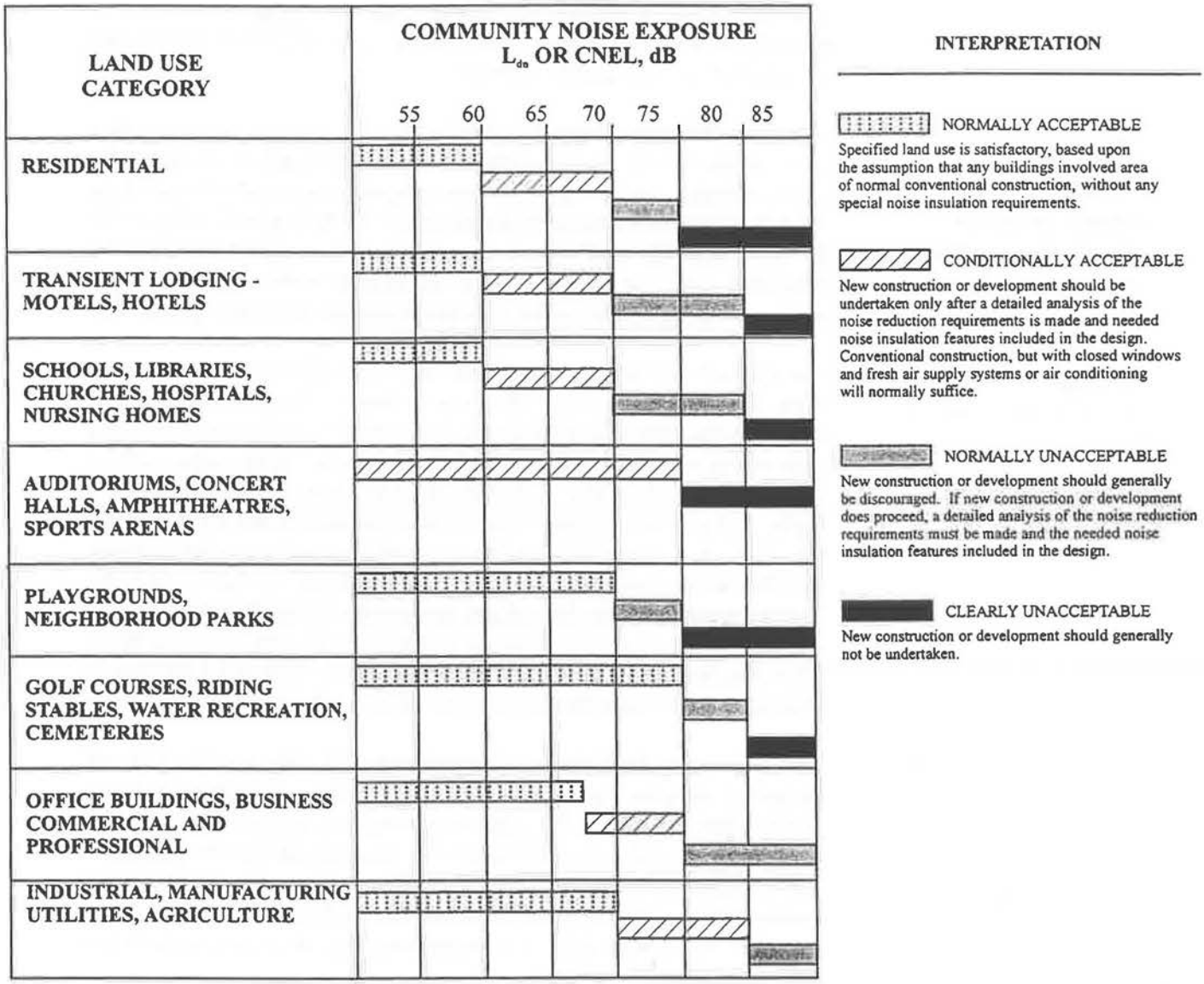
traffic, trains, commercial establishments, machinery, air conditioning systems, industrial operations and landscape maintenance equipment. Sensitive noise receptors primarily consist of residences but also include schools, hospitals, parks, libraries and churches. Residents and other sensitive noise receptors can be protected from noise by distancing noise sources. When residential uses are located near major transportation corridors and activity centers, sound levels experienced by residents can be reduced through building design.

"The City will implement established noise standards indicating which types of land uses are compatible with varying levels of noise..."

The City will implement established noise standards indicating which types of land uses are compatible with varying levels of noise to the extent feasible. Noise and land use compatibility standards issued by the state serve as the basis for the local standards depicted in Figure N-3. When development projects are proposed, the City will compare the proposed land use type and noise conditions to the standards, and determine the suitability of the development project for that specific site.

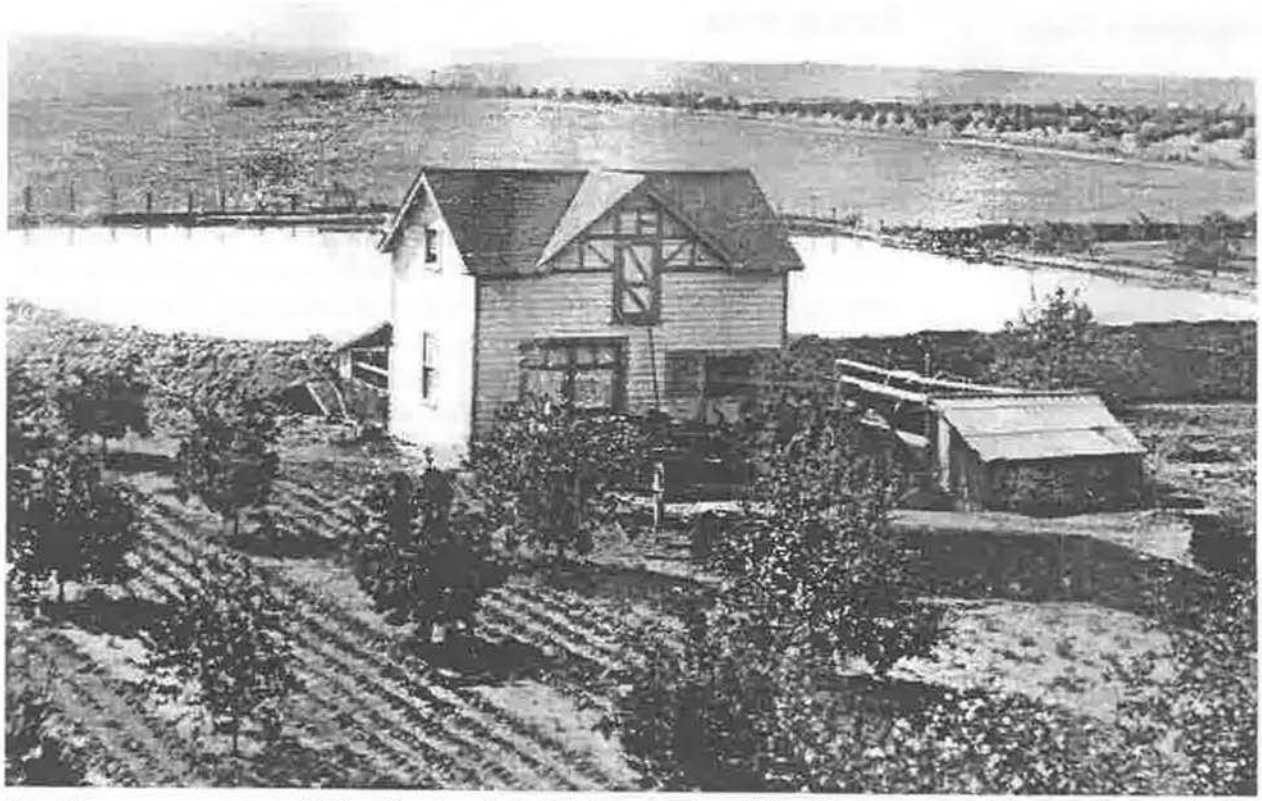
The City will also require that all new residential development meet the state Title 24 standard for interior noise levels. Title 24 requires that interior noise levels for both single-family and multiple-family dwelling units equal 45 dB(A) CNEL or less. Furthermore, noise studies will be required for all proposed residential sites in close proximity to automotive traffic, rail or light industrial sources with baseline levels exceeding 60 dB CNEL. As a requisite for project approval, the study must demonstrate that the interior noise level will not exceed 45 dB (A). Interior noise levels in noisy areas can often be reduced to meet the 45 dB(A) CNEL standard through extra insulation, treated windows and ventilation systems. Orienting buildings away from the noise source and using barriers to attenuate noise transmission also help reduce interior noise levels.

As required by the California Environmental Quality Act, the City will review development proposals for noise impacts. Two types of noise impacts can occur: 1) the noise conditions are incompatible with the proposed use and will interfere with the new use, or 2) if the proposed use will generate noise that impacts nearby sensitive noise receptors such as residences, schools, parks, churches and the library. For all identified impacts, the project must incorporate measures to ensure appropriate noise conditions.



Source: Office of Noise Control, California Dept. of Health, Feb. 1976.

Figure N-3
Land Use Compatibility



Troxell house, near corner of Olive Street and Central Avenue, circa 1900. Photo courtesy of Lemon Grove Historical Society.

Quiet Neighborhoods

"Lemon Grove residents enjoy quiet conditions largely due to the established land use patterns."

Lemon Grove residents enjoy quiet conditions largely due to the established land use patterns. The best way to preserve quiet in the neighborhoods is to limit development of land uses that generate noise either within or adjacent to the neighborhoods. Commercial, light industrial and transportation activity is primarily concentrated in the northern part of the City, away from the neighborhoods. This provides quiet conditions for residents. The Land Use Plan in the Community Development Element - the guide for future development - reinforces this land use pattern in part to protect the established neighborhoods.

Because traffic comprises the primary source of noise in Lemon Grove, traffic in the neighborhoods will be restricted. The Circulation Plan in the Mobility Element sets forth a hierarchical system of arterials and collectors to efficiently direct traffic through the City and around the neighborhoods. Primary objectives of the Circulation Plan design include reducing traffic volumes and speeds in the neighborhoods.

Transportation Noise

"Redevelopment [north of Broadway] will reduce the negative noise effects associated with the freeway."

Freeway Noise

The primary source of noise in Lemon Grove is generated by vehicle traffic traveling on the SR-94 freeway and local thoroughfares. Minimizing noise problems requires addressing the effects of noise from the freeways and local traffic. The SR-94 freeway comprises the northern boundary of the City, and the freeway traffic elevates noise levels north of Broadway. Most of the development exposed to freeway noise consists of commercial and light industrial uses and is not adversely impacted. The residential neighborhood abutting the freeway, between Corona Street and Vista Way, experiences excessive noise. However, this area is planned to transition to commercial development, according to the Land Use Plan in the Community Development Element. Redevelopment will reduce the negative noise effects associated with the freeway.

The Land Use Plan calls for the maintenance of other existing residential uses near the freeway, east of Lemon Grove Avenue. Additional apartment and condominium development is also encouraged in these areas. Future residential development affected by freeway noise must comply with the Title 24 standards. Furthermore, the City will request that Caltrans construct noise barriers along the SR-94 right-of-way to improve the living environment.

Construction and operation of the planned SR-125 freeway, which will form the City's eastern boundary, will significantly increase noise levels in nearby areas. Both residences and schools near the freeway corridor will be adversely affected. The Environmental Impact Report for the freeway project requires mitigation programs to reduce the noise effects, primarily through the use of noise barriers. The City will monitor planning and construction of the freeway to help make sure that all of the required mitigation measures are properly implemented.

Trolley Noise

"...the trolley is audible in close proximity to the tracks."

The East County Trolley Line, operated by the Metropolitan Transit Development Board (MTDB), extends north to south through the center of town. When traveling through Lemon Grove, the trolley is audible in close proximity to the tracks. With the exception of the necessary warning horns and audible crossing gates, electric trolleys are relatively quiet. The intermittent nature of operations does not significantly increase daily average noise exposure. However, local residents have expressed concerns about the noise from trolley operations. The City will identify

objectional sources of trolley noise along with the community and MTDB and develop appropriate measures to reduce noise where feasible.

Vehicle Noise

"...actively enforce vehicle noise and speed laws to reduce ambient noise levels."

Traffic noise throughout the City is greatly influenced by travel speeds and the adequacy of muffler systems. The state Department of Motor Vehicles (DMV) regulates muffler systems to optimize noise suppression and local law enforcement agencies can cite drivers for violating the DMV noise regulations. Speed limits in Lemon Grove are set and enforced by the Sheriff's Department. The City will coordinate with the Sheriff's Department to actively enforce vehicle noise and speed laws to reduce ambient noise levels.

Other Noise Sources

Activities other than transportation contribute to local noise levels, but to a significantly reduced degree. These sources include construction activity, loud music, landscaping maintenance equipment, alarms, trash trucks and barking dogs. The City's Noise Abatement and Control Ordinance, established to protect the health and welfare of residents, contains regulations to control noise from these sources and many other nuisances. Active enforcement of the ordinance will help maintain quiet conditions. The City should educate the community about the ordinance to encourage conformance as well as reporting of possible violations.

Downtown Village and Massachusetts Station STAs

The Land Use Plan in the Community Development Element identifies redevelopment with mixed uses in the Downtown Village and Massachusetts Station Special Treatment Areas (STAs). A mix of retail, office, public, condominium and apartment development will occur in the Downtown Village STA, and a mix of neighborhood commercial, condominium and apartment development is planned for the Massachusetts STA. The quality of life in mixed use areas can be diminished by excessive noise from the commercial components. The City will require that future residential development within the STAs conforms to the Title 24 interior noise standards and require appropriate measures to reduce noise.

Traffic Noise Calculator: FHWA 77-108

Lemon Grove Early Education Center (LGSD-01.0) Traffic Noise Traffic Conditions

	Output						Inputs														Auto Inputs	
	dBA at 50 feet			Distance to CNEL Contour				Segment														
ID	$L_{eq\text{-}24hr}$	L_{dn}	CNEL	70 dBA	65 dBA	60 dBA	Roadway	From - To		ADT	Posted Speed Limit	Grade	% Autos	% Med Trucks	% Heavy Trucks	% Daytime	% Evening	% Night	Number of Lanes	Site Condition	Distance to Reciever	Ground Absorption	Lane Distance
1	58.3	61.1	61.8	8	24	75	Palm Street – West of Project Site	Palm Lane	West of Site	7,100	25	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	2	Hard	50	0	20
2	57.9	60.7	61.4	7	22	69	Palm Street – East of Project Site	Golden Avenue	East of Site	6,500	25	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	2	Hard	50	0	20

Traffic Noise Calculator: FHWA 77-108

Lemon Grove Early Education Center (LGSD-01.0) Traffic Noise Traffic Conditions

	Output						Inputs													Auto Inputs	
	dBA at 50 feet			Distance to CNEL Contour				Segment													
ID	$L_{eq\text{-}24hr}$	L_{dn}	CNEL	70 dBA	65 dBA	60 dBA	Roadway	From - To		ADT	Posted Speed Limit	Grade	% Autos	% Med Trucks	% Heavy Trucks	% Daytime	% Evening	% Night	Number of Lanes	Site Condition	Distance to Reciever	Ground Absorption	Lane Distance
1	59.5	62.3	63.0	10	31	99	m Street – West of Project S	Palm Lane	West of Site	9,140	25	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	4	Hard	50	0	44
2	59.8	62.6	63.3	11	34	107	lm Street – East of Project S	Golden Avenue	East of Site	6,880	25	200.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	4	Hard	50	0	44

Traffic Noise Calculator: FHWA 77-108 **Santa Fe Elementary School Expansion (PVSD-01.0) Traffic Noise Traffic Conditions**

	Output						Inputs													Auto Inputs	
	dBA at 50 feet			Distance to CNEL Contour				Segment														
ID	$L_{eq\text{-}24hr}$	L_{dn}	CNEL	70 dBA	65 dBA	60 dBA	Roadway	From - To		ADT	Posted Speed Limit	Grade	% Autos	% Med Trucks	% Heavy Trucks	% Daytime	% Evening	% Night	Number of Lanes	Site Condition	Distance to Reciever	Ground Absorption	Lane Distance
1	58.5	61.3	62.0	8	25	78	Palm Street – West of Project Site	Palm Lane	West of Site	7,400	25	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	2	Hard	50	0	20
2	58.1	60.9	61.6	7	23	72	Palm Street – East of Project Site	Golden Avenue	East of Site	6,800	25	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	2	Hard	50	0	20

Traffic Noise Calculator: FHWA 77-108

Lemon Grove Early Education Center (LGSD-01.0) Traffic Noise Traffic Conditions

	Output						Inputs													Auto Inputs	
	dBA at 50 feet			Distance to CNEL Contour																	
ID	$L_{eq\text{-}24hr}$	L_{dn}	CNEL	70 dBA	65 dBA	60 dBA	Roadway	Segment From	Segment To	ADT	Posted Speed Limit	Grade	% Autos	% Med Trucks	% Heavy Trucks	% Daytime	% Evening	% Night	Number of Lanes	Site Condition	Distance to Reciever	Ground Absorption	Lane Distance
1	59.6	62.4	63.1	10	32	102	m Street – West of Project S	Palm Lane	West of Site	9,440	25	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	4	Hard	50	0	44
2	60.0	62.8	63.5	11	35	111	lm Street – East of Project S	Golden Avenue	East of Site	7,180	25	200.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	4	Hard	50	0	44