5.11 NOISE

This section discusses the fundamentals of sound; examines federal, state, and local noise and vibration guidelines, policies, and standards; reviews noise levels at existing receptor locations; and evaluates potential noise and vibration impacts associated with buildout of the proposed Torrance General Plan update for 2030. This evaluation uses procedures and methodologies as specified by California Department of Transportation (Caltrans), the Federal Highway Administration, and the Federal Railroad Administration. Noise modeling conducted by Wieland Associates and associated noise and vibration calculations are included in Appendix I, *Noise Monitoring and Modeling Data.*

5.11.1 Environmental Setting

Terminology/Noise Descriptors

Noise is most often defined as unwanted sound. 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.”

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 on a logarithmic scale.

- **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}).** The mean of the noise level averaged over the measurement period, regarded as an average level.

- **Day-Night Level (L_{dn}).** 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 to the levels occurring during the period from 7:00 PM to 10:00 PM and 10 dB added to the sound levels occurring during the period from 10:00 PM to 7:00 AM.

L_{dn} and CNEL values rarely differ by more than 1 dB. As a matter of practice, L_{dn} and CNEL values are considered equivalent and are treated as such in this assessment.

Characteristics of Sound

When an object vibrates, it radiates part of its energy as acoustical pressure in the form of a sound wave. Sound can be described in terms of amplitude (loudness), frequency (pitch), or duration (time). The human hearing system is not equally sensitive to sound at all frequencies. Therefore, to approximate the human, frequency-dependent response, the A-weighted filter system is used to adjust measured sound levels. The normal range of human hearing extends from approximately 0 dBA to 140 dBA.

Unlike linear units such as inches or pounds, decibels are measured on a logarithmic scale, represented by points on a sharply rising curve. 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 5.11-1, *Change in Sound Pressure Level, dB*, presents the subjective effect of changes in sound pressure levels.

Table 5.11-1
Change in Sound Pressure Level, dB

Change in Apparent Loudness	
± 3 dB	Threshold of human perceptibility
± 5 dB	Clearly noticeable change in noise level
± 10 dB	Half or twice as loud
± 20 dB	Much quieter or louder

Source: Bies and Hansen 1988

Sound is generated from a source and decibel level decreases as the distance from that source increases. Sound dissipates exponentially with distance from the noise source. This phenomenon is known as spreading loss.

When sound is measured for distinct time intervals, the statistical distribution of the overall sound level during that period can be obtained. The energy-equivalent sound level (L_{eq}) is the most common parameter associated with such measurements. The L_{eq} metric is a single-number noise descriptor of average sound level over a given period of time. For example, L_{50} is the noise level that is exceeded 50 percent of the time: half the time the noise exceeds this level and half the time it is less than this level. This is also the level that is exceeded 30 minutes in an hour. Similarly, the L_{02}, L_{08}, and L_{25} values are exceeded 2, 8, and 25 percent of the time or 1, 5, and 15 minutes per hour. Other values typically noted during a noise survey are the L_{min} and L_{max}. These values are the minimum and maximum root-mean-square noise levels obtained over the measurement period.

Because community receptors are more sensitive to unwanted noise intrusion during the evening and at night, state law requires that, for planning purposes, an artificial dB increment be added to quiet-time noise levels in the CNEL/L_{dn}.

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 would result in permanent cell damage. When the noise level reaches 120 dBA, a tickling sensation occurs in the human ear even with short-term exposure. This level of noise is called the threshold of feeling. As the sound reaches 140 dBA, the tickling sensation is replaced by the feeling of pain in the ear, called the threshold of pain. A sound level of 160 to 165 dBA will result in dizziness or loss of equilibrium. The ambient or background noise problem is widespread and generally more concentrated 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. Table 5-11-2 is the criteria established by the state for minimizing adverse noise effects.

Table 5.11-2
State Criteria for Minimizing Adverse Noise Effects on Humans

Objective	dBA Range
Prevent Hearing Loss	75 to 80
Prevent Physiological Effects (other than hearing loss)	65 to 75
Prevent Speech Interference	50 to 60
Address People's Subjective Preference for Noise Control	45 to 50
Prevent Sleep Interruption	35 to 45

Source: OPR 2003

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 such as railroads or vibration-intensive stationary sources, but can also be associated with construction equipment such as jackhammers, pile drivers, and hydraulic hammers. Vibration displacement is the distance that a point on a surface moves away from its original static position. The instantaneous speed that a point on a surface moves is the velocity and the rate of change of the speed is the acceleration. Each of these descriptors can be used to correlate vibration to human response, building damage, and acceptable equipment vibration levels. During project 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. This type of vibration is best measured in velocity and acceleration.

The three main wave types of concern in the propagation of groundborne vibrations are surface or Rayleigh waves, compression or P-waves, and shear or S-waves.

- Surface or Rayleigh waves travel along the ground surface. They carry most of their energy along an expanding cylindrical wave front, similar to the ripples produced by throwing a rock into a lake. The particle motion is more or less perpendicular to the direction of propagation (known as retrograde elliptical).

- Compression or P-waves are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal, in a push-pull motion. P-waves are analogous to airborne sound waves.

- Shear or S-waves are also body waves, carrying their energy along an expanding spherical wave front. Unlike P-waves, however, the particle motion is transverse, or perpendicular to the direction of propagation.

The peak particle velocity (PPV) or the root mean square (RMS) velocity is usually used to describe vibration amplitudes. 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, whereas RMS is typically more suitable for evaluating human response.

The units for PPV and RMS velocity are normally inches per second (in/sec). Often, vibration is presented and discussed in dB units in order to compress the range of numbers required to describe the vibration. In this study, all PPV and RMS velocity levels are in in/sec and all vibration levels are in dB relative to one microinch per second (abbreviated as VdB). The threshold of perception is approximately 65 VdB. Typically, groundborne vibration generated by human activities attenuates rapidly with distance from the source of the vibration. Even the more persistent Rayleigh waves decrease relatively quickly as they move away from the source of the vibration. Manmade vibration problems are, therefore, usually confined to short distances (500 feet or less) from the source.

Construction operations generally include a wide range of activities that can generate groundborne vibration. In general, blasting and demolition of structures generate the highest vibrations. Vibratory compactors or rollers, pile drivers, and pavement breakers can generate perceptible amounts of vibration at up to 200 feet. Heavy trucks can also generate groundborne vibrations, which vary depending on vehicle type, weight, and pavement conditions. Potholes, pavement joints, discontinuities, differential settlement of pavement, etc., all increase the vibration levels from vehicles passing over a road surface. Construction vibration is normally of greater concern than vibration of normal traffic on streets and freeways with smooth pavement conditions. Trains generate substantial quantities of vibration due to their engines, steel wheels, and heavy loads.

Regulatory Framework

To limit population exposure to physically and/or psychologically damaging as well as intrusive noise levels, the federal government, the State of California, various county governments, and most municipalities in the state have established standards and ordinances to control noise. The City of Torrance regulates noise through the City of Torrance Municipal Code, Division 4, Chapter 6, Noise Regulation. Potential noise and vibration impacts were evaluated based on the City of Torrance, Municipal Code, Federal Transit Administration (FTA) methodology, and supplemental criteria for single-event noise to determine whether a significant adverse noise impact would result from the construction and operation of the proposed project.

State of California Building Code

The State of California's noise insulation standards are codified in the California Code of Regulations, Title 24, Building Standards Administrative Code, Part 2, California Building Code. These noise standards are applied to new construction in California for the purpose of interior noise compatibility from exterior noise sources. The regulations specify that acoustical studies must be prepared when noise-sensitive structures, such as residential buildings, schools, or hospitals, are located near major transportation noise sources, and where such noise sources create an exterior noise level of 60 dBA CNEL or higher. Acoustical studies that accompany building plans must demonstrate that the structure has been designed to limit interior noise in habitable rooms to acceptable noise levels. For new residential buildings, schools, and hospitals, the acceptable interior noise limit for new construction is 45 dBA CNEL.

City of Torrance Land Use Compatibility Criteria

Table 5.11-3 presents a land use compatibility chart for community noise proposed by the City of Torrance General Plan update noise element. This table provides urban planners with a tool to gauge the compatibility of new land uses relative to existing and future noise levels. The City requires preparation of an acoustical analysis when noise sensitive land uses are proposed within noise impact areas.

Table 5.11-3
Torrance Noise/Land Use Compatibility Guidelines

Property Receiving Noise		Maximum Noise Level dBA (L_{dn} or CNEL)	
Type of Use	**Land Use Designations**	**Interior**	**Exterior**
Residential[1]	Low Density Residential Low-Medium Density Residential Medium Density Residential	45	60/65[2]
	Medium-High Density Residential	45	60/70[3]
	High Density Residential	45	70[2]
Commercial and Office	General Commercial Commercial Center	—	70
	Residential Office	50	70
Industrial	Business Park Light Industrial Heavy Industrial	55	75
Public and Medical Uses	Public/Quasi-Public/Open Space	50	65
	Hospital/Medical	50	70
Airport	Airport	—	70

Source: Torrance, City of. General Plan Update, Noise Element, Table N-3.
1 Regarding aircraft-related noise, the maximum acceptable exposure for new residential development is 60 dBA CNEL.
2 This normally acceptable standard is 60 dBA CNEL. The higher standard is acceptable, subject to inclusion of noise-reduction features in project design and construction.
3 Maximum exterior noise levels up to 70 dB CNEL are allowed for Multiple-Family housing.

City of Torrance – Stationary-Source Noise Standards

Pursuant to the City's municipal code, noise levels generated at a property are restricted from exceeding certain noise levels for extended periods of time. The City applies the noise control ordinance standards (summarized in Table 5.11-4) to nontransportation noise sources. These standards do not gauge the compatibility of noise-sensitive development to the noise environment, but provide restrictions on the amount and duration of noise generated at a property, as measured at the property line of the noise receptor. The City's noise ordinance is designed to protect people from objectionable nontransportation noise sources such as music, machinery, pumps, and air conditioners. The noise standards in Table 5.11-4 apply to all properties within a designated noise zone. Figure 5.11-1, *Regions Corresponding to Noise Limits in Torrance*, shows the noise regions referenced in Table 5.11-4.

Table 5.11-4
Exterior Noise Standards

Noise Region[1]	Time Period	Maximum Permissible Noise Level (dBA L_{eq})[2]
Industrial/Commercial Region 1	10 PM to 7 AM	65
	7 AM to 10 PM	70
Industrial/Commercial Region 2	10 PM to 7 AM	55
	7 AM to 10 PM	60
Residential Region 3	10 PM to 7 AM	45
	7 AM to 10 PM	50
Residential Region 3 Within the 500-Foot Buffer Zone	10 PM to 7 AM	50
	7 AM to 10 PM	55
Residential Region 4	10 PM to 7 AM	45
	7 AM to 10 PM	50
Residential Region 4 With the 500-Foot Buffer Zone	10 PM to 7 AM	55
	7 AM to 10 PM	60

Source: City of Torrance Municipal Code, Division 4, Chapter 6, Section 46.7.2, Noise Limits.
[1] Region in which the noise receiver is located.
[2] If the ambient noise level exceeds the maximum permissible noise limits, the ambient noise level becomes the noise standard. If noise consists of: (1) a steady, audible tone, such as a whine, screech or hum; (2) a repetitive impulse noise, such as hammering or riveting; or (3) noise that occurs on Sunday morning between 12:01 AM and 12:01 PM, noise limits shall be reduced by 5 dBA. If noise source is not continuous and occurs less than 5 hours per day or less than 1 hour per night, noise limits shall be increased by 5 dBA. If noise source is not continuous and occurs less than 90 minutes per day or less than 20 minutes per night, noise limits shall be increased by 10 dBA. If noise source is not continuous and occurs less than 30 minutes per day or less than 6 minutes per night, noise limits shall be increased by 15 dBA.

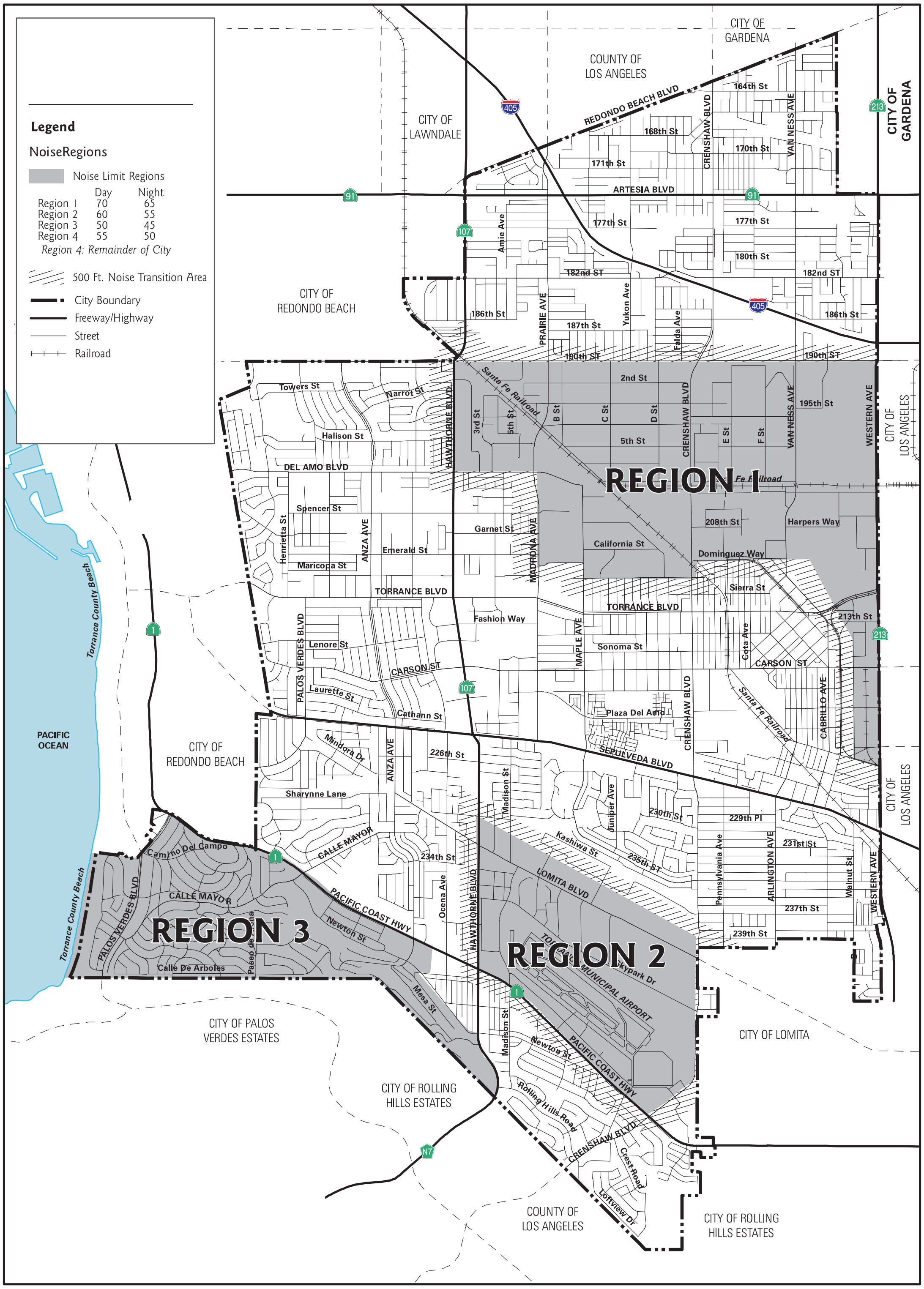
Machinery, Equipment, Fans, and Air Conditioning

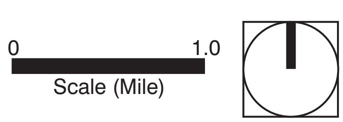
Pursuant to the City's Municipal Code, noise from machinery, equipment, pumps, fans, air conditioning apparatus, or similar mechanical devices are prohibited from creating noise that would cause the noise level at the property line of any residential land to exceed the ambient noise environment by more than 5 dBA.

Construction of Buildings and Projects

The City of Torrance prohibits outside construction or repair work on buildings, structures, or projects in or adjacent to a residential area between the hours of 6:00 PM and 7:30 AM Monday through Friday and 5:00 PM to 9:00 AM on Saturday that exceeds 50 dBA at a residential property line. Construction is prohibited on Sundays. Properties zones as commercial, industrial, or within an established redevelopment District are exempt from the day and hour restrictions as long as there is a minimum 300-foot buffer between the property and the property line of the nearest residential use and noise levels do not exceed 50 dBA at the residential property line.

Regions Corresponding to Noise Limits in Torrance





Source: Torrance General Plan 2005

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Heavy construction equipment such as pile drivers, mechanical shovels, derricks, hoists, pneumatic hammers, compressors, or similar devices are not allowed to be operated at any time within or adjacent to a residential area without obtaining permission from the director of Building and Safety. The request for permission to operate such equipment must include a list and type of equipment to be used, the requested hours of operation, and locations of equipment usage. The application for permission to use heavy construction equipment is required to show that the selection of equipment and construction techniques has been based on minimization of noise within the limitations of such equipment, as is commercially available, or combinations of such equipment and auxiliary sound barriers. Permission to operate heavy construction equipment can be revoked by the director of Building and Safety if operation of such equipment is not in accordance with approval.

Projects requiring Planning Commission review or projects considered to be a significant remodel are required to post this information on a board along the front property line that displays the owner's name and contact number, contractor's name and contact number, a copy of Torrance Municipal Code Section 46.3.1, a list of any special conditions, and the code enforcement phone number where violations can be reported.

FTA Vibration Criteria

Vibration Annoyance

Groundborne noise is the vibration of floors and walls that may cause rattling of items such as windows or dishes on shelves, or a rumbling noise. The rumbling is created by the motion of the room surfaces, which act like a giant loudspeaker (FTA 2006). The FTA provides criteria for acceptable levels of groundborne vibration based on the relative perception of a vibration event for vibration-sensitive land uses (see Table 5.11-5). The City of Torrance requires equipment and machinery in a manufacturing zone to be operated so as to generate vibration which is perceptible at or beyond the property line, without the aid of instruments to a person of normal sensibilities (Section 91.32.1, *Permissible Uses*, City of Torrance Municipal Code).

Table 5.11-5
Groundborne Vibration and Noise Impact Criteria – Human Annoyance

Land Use Category	Max L_v (VdB)[1]	Description
Workshop	90	Distinctly felt vibration. Appropriate to workshops and nonsensitive areas
Office	84	Felt vibration. Appropriate to offices and nonsensitive areas.
Residential – Daytime	78	Barely felt vibration. Adequate for computer equipment.
Residential – Nighttime	72	Vibration not felt, but groundborne noise may be audible inside quiet rooms.

Source: FTA 2006
[1] As measured in 1/3-octave bands of frequency over the frequency ranges of 8 to 80 Hz.

Vibration-Related Structural Damage

The level at which groundborne vibration is strong enough to cause structural damage has not been determined conclusively. The most conservative estimates are reflected in the FTA standards, shown in Table 5.11-6.

Table 5.11-6
Groundborne Vibration and Noise Impact Criteria – Structural Damage

Building Category	PPV (in/sec)	VdB
I. Reinforced concrete, steel, or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Nonengineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

Source: FTA 2006
Note: RMS velocity calculated from vibration level (VdB) using the reference of one microinch/second.

Vibration-related problems generally occur due to resonances in the structural components of a building. The maximum vibration amplitudes of the floors and walls of a building will often be at the resonance frequencies of various components of the building. That is, structures amplify groundborne vibration. Resonant response is frequency dependent and 1/3-octave band charts are best for describing vibration behavior. Wood-frame buildings, such as typical residential structures, are more easily excited by ground vibration than heavier buildings. According to the Caltrans' *Transportation Related Earthborne Vibration* (2002), extreme care must be taken when sustained pile driving occurs within 25 feet of any building; the threshold at which there is a risk of architectural damage to normal houses with plastered walls and ceilings is 0.2 in/sec.

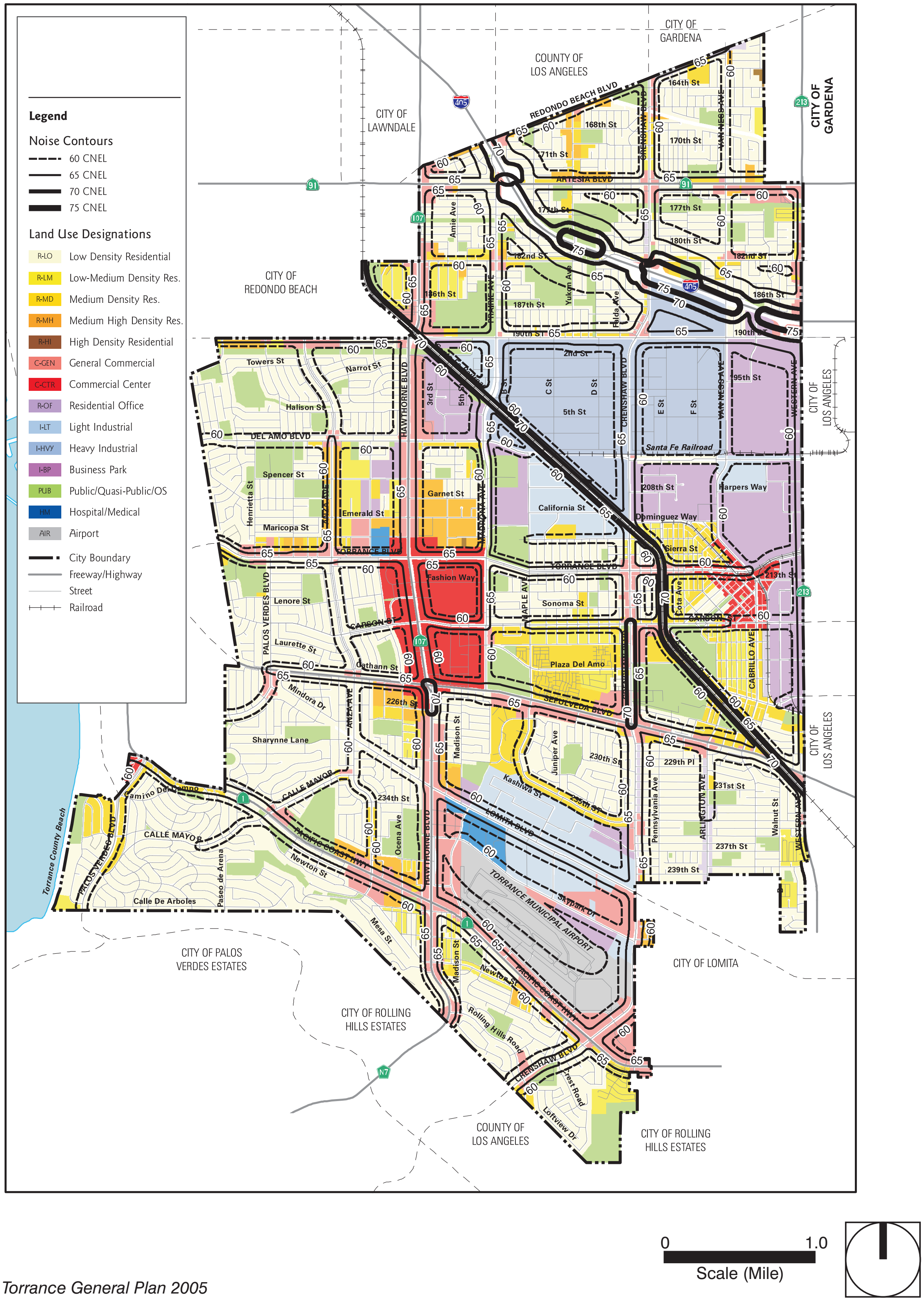
Existing Noise Environment

The City of Torrance is impacted by a multitude of noise sources, many of them directly connected with major arterials that traverse the City. Mobile sources of noise, especially cars and trucks, are the most common and significant sources of noise in most communities. In addition, the City of Torrance is home to the Torrance Airport, the main line of the Burlington Northern Santa Fe (BNSF) railway, and several industrial facilities that also contribute to the ambient noise environment. Figure 5.11-2, *Existing Noise Levels from Transportation Sources*, shows noise levels from major roadway transportation sources.

On-Road Vehicles

Noise from motor vehicles is generated by engine vibrations, the interaction between tires and the road, and the exhaust system. Reducing the average motor vehicle speed reduces the noise exposure of receptors adjacent to the road. Each reduction of five miles per hour reduces noise by about 1 dBA. Major regional roadways such as I-405, Hawthorne Boulevard, Sepulveda Boulevard, Pacific Coast Highway (PCH), Torrance Boulevard, and Crenshaw Boulevard accommodate large volumes of traffic and are responsible for a significant contribution to the noise environment in Torrance. Local roadways primarily accommodate local traffic for the City and include both major arterials and smaller collector streets. While local roadways are not a major source of noise for the City as a whole, they contribute a large proportion of the ambient noise at the neighborhood level.

Existing Noise Levels from Transportation Sources



Source: Torrance General Plan 2005

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Train Noise

One BNSF railway traverses the City of Torrance going south–north, and is part of the Harbor Subdivision Line. The Harbor Subdivision line is a single-track railroad through the City of Torrance, and trains on the BNSF railway through Torrance are intermittent. There are several rail spurs connecting the main line to industrial properties in the City. However, many rail spurs have been abandoned. Noise generated by the train traffic on the BNSF railway contributes to the ambient noise environment along this transportation route. Noise from trains on the BNSF railway is generated by warning horns and crossing bells at at-grade crossings, engines, exhaust systems, cooling fans, and other mechanical gear noise. The interaction of steel wheels and rails generates rolling noise due to continuous contact; impact noise when a wheel encounters a discontinuity, such as a rail joint, turnout, or crossover; and squeals generated by friction on tight curves. Trains are required by the Federal Railroad Administration (FRA) to sound a warning horn at one-quarter mile from all at-grade crossings and at a maximum 110 dBA, as measured at 100 feet, except those that have established a quiet zone. A quiet zone is a segment of rail line where locomotive horns are not routinely sounded because alternative passive and active safety devices warn that a train is approaching. However, there are no quiet zones for the City of Torrance. Figure 5.11-2 shows the existing train noise contours for the BNSF railway.

Aircraft Noise

Noise from Torrance Airport is produced by idling, takeoffs, flyovers/overflights, approaches, and landings. Each of these events results in noise exposure to sensitive receptors near the airports. The California Public Resources Code, Section 21096, requires that when preparing an environmental impact report for any project within an airport influence area as defined by an airport land use compatibility plan, the lead agency shall utilize the *California Airport Land Use Planning Handbook* as a technical resource with respect to airport noise and safety compatibility issues. The basis for compatibility zone delineation for airports is the CNEL contours created with the Federal Aviation Administration (FAA) Integrated Noise Model for private and public airports.

The Torrance Airport, also known as Zamperini Field, is in the southern portion of the City and is a general aviation airport. The airport's regular hours of operation are between 7 AM and 10 PM, Monday through Friday, and 8 AM to 10 PM on Saturday, Sunday, or federal holidays. While the airport accommodates both propeller and jet aircraft, jet aircraft is limited because jet fuel is not sold at the airport. The airport noise contour for Torrance Airport is shown in Figure 5.11-3, *Torrance Airport Noise Contour*. In general, the 60 dBA CNEL noise contour is confined to the area south of Lomita Boulevard and north of the Pacific Coast Highway (PCH). The 65 dBA CNEL is not reported for this general aviation airport due to the low level of flight activity. In accordance with the City of Torrance Municipal Code, Section 48.8.8, Aircraft Noise Limit, aircrafts taking off and landing at the Torrance Municipal Airport may not exceed a single-event noise exposure level of 88 dBA or a maximum sound level of 82 dBA L_{max} as measured at ground level outside of the airport boundaries.

Heliports

The Torrance Memorial Medical Center heliport is on the grounds of the Torrance Airport. In addition, Robinson Helicopter, which is adjacent to the airport, manufactures civil helicopters. Helicopter operations in the City are not frequent. Use of helipads generates noise during take-offs and landings in the immediate vicinity of the helipad. Unlike fixed-wing aircraft, helicopters produce noise not only from the engine but also from the relatively slowly turning main rotor. This sound modulation is called blade slap. According to the *Airport Land Use Compatibility Handbook* (Caltrans 2002), to a listener on the ground, helicopter noise is most audible as the aircraft approaches. Noise from emergency use of helipads contributes minimally to the ambient noise environment in the City. However, single-event noise from helicopter overflights can substantially elevate ambient noise levels.

Stationary Sources of Noise

Stationary sources of noise include commercial and industrial equipment and activities. Whereas mobile-source noise affects many receptors along an entire length of roadway, stationary noise sources affect only their immediate areas. Major stationary sources in the City include local industrial plants, including railroad classification yards due to train ingress/egress, maintenance activities, and idling (train noise occurring outside the train yard from sounding of bells and whistles at at-grade crossings is considered mobile-source noise). The City's Noise Ordinance (Chapter 6, *Noise Regulations*, of the City of Torrance Municipal Code) regulates stationary-source noise generated at properties within the City.

In addition, while schools are considered noise-sensitive because of the necessity for quiet in the classroom to provide an adequate environment for learning, outdoor activities that occur on school campuses throughout the City generate noticeable levels of noise. While it is preferable to have schools in residential areas to support the neighborhood, noise generated on both the weekdays (by physical education classes and sports programs) and weekends (by use of the fields by youth organizations) can elevate noise levels.

Local Noise Monitoring Data

A study of baseline noise sources and levels was completed in August 2006 by Wieland Associates and is incorporated by reference in this EIR. Wieland conducted field monitoring on in March through May of 2006 in the City of Torrance. The noise monitoring locations are shown in Figure 5.11-4, *Noise Monitoring Locations*. The results of the noise monitoring are presented in Table 5.11-7, *Noise Monitoring of Existing Noise Levels*.

Table 5.11-7
Noise Monitoring of Existing Noise Levels

Number	Location	Noise Level Exceeded for More Than… (minutes/hour) 30 (L_{50})	15 (L_{25})	5 (L_8)	1 (L_2)	Maximum Noise (dBA L_{max})	Average Noise (dBA L_{eq})	CNEL
1	3456 Redondo Beach Boulevard	67.5	69.8	71.9	73.9	80.9	68.6	—
2	Corner of Prairie and 177th	67.2	69.1	71.0	73.2	78.5	68.0	—
3	3830 176th Street	56.4–67.8	58.4–68.6	59.7–69.4	61.0–69.9	65.0–78.6	57.2–67.9	70.1
4	Corner of Crenshaw and 171st	67.0	70.4	72.5	74.6	81.4	68.8	—
5	Corner of Artesia and Wilton	65.5	68.1	70.5	72.6	79.8	66.9	—
6	3635 190th Street	48.9–64.7	51.0–66.5	57.2–68.3	61.9–70.7	69.4–92.3	53.4–66.4	67.3
7	18832 Van Ness Avenue	49.5–60.6	51.6–61.5	53.5–62.5	54.6–64.9	57.9–85.2	51.1–60.8	63.2
7a	18736 Van Ness Avenue	65.0–65.2	67.5–67.8	70.1–70.5	72.0–72.6	77.3–93.9	66.6–67.8	—
8	4504 Deelane Street	47.9–64.5	53.4–65.9	57.7–67.4	60.6–68.8	65.9–88.6	52.8–64.8	66.3
9	4712 Torrance Boulevard	66.7	67.3	68.7	70.2	74.3	65.2	—
10	3322 Sonoma Street	65.8	69.6	72.3	74.0	79.0	68.0	—
11	Corner of Watson and Carson	63.6	65.5	67.3	69.3	74.7	64.3	—
12	Corner of 226th and Hawthorne	72.0	73.8	75.3	77.0	83.7	72.5	—
13	2273 Nadine Circle	39.3–55.9	40.1–60.1	41.5–63.9	46.2–67.3	62.8–78.8	43.1–59.7	58.1
14	22710 Date Avenue	41.4–62.6	49.9–65.5	56.5–67.3	60.5–68.8	68.9–80.0	51.5–63.8	65.9
15	Corner of Gramercy and Sepulveda	69.1	74.1	76.2	77.7	86.8	72.0	—
16	1828 Calamar Street	28.6–50.7	29.9–57.1	32.2–61.6	34.7–67.9	43.4–99.3	29.7–70.2	64.1
17	Corner of Harrlee and PCH	61.2	62.9	64.9	68.2	81.6	62.7	—
18	3932 231st Place	32.7–53.5	33.3–59.8	34.9–65.1	36.6–68.4	42.2–76.6	34.1–59.8	52.4
19	Corner of 236th and Western	41.4–63.7	49.2–65.8	53.6–67.9	57.1–69.3	65.6–81.0	49.0–64.5	66.0
20	3241 Cricklewood Street	31.5–60.1	35.9–62.6	48.7–66.3	55.7–70.3	64.9–83.6	44.7–62.6	63.3

Source: Wieland Associates, Inc. 2006

Notes:

Noise monitoring sites 1,2, 4, 5, 7a, , 9 through 12, 15, and 17 were conducted for a period of 15 to 20 minutes.

Noise monitoring sites 3, 6, 7, 8, 13, 14, 16, and 18 through 20 were conducted for a period of 24 hours.

The primary noise sources at the noise monitoring locations was traffic, with the exception of the following: primary sources of noise at Site 6 included the refinery; stationary noise at the Honeywell property contributed to the ambient noise environment at Sites 7 and 7a; ambient noise comprised the majority of noise at Site 13; the primary source of noise at Site 16 was the BNSF railroad, the primary source of noise at site 18 was the airport; and major sources of noise at Site 20 included the airport.

Sensitive Receptors

Certain land uses are particularly sensitive to noise and vibration. These uses include residential, school, and open space/recreation areas where quiet environments are necessary for enjoyment, public health, and safety. In the City of Torrance, sensitive noise receptors are primarily located in residential areas of the City. Commercial and industrial uses are not considered noise- and vibration-sensitive uses.

5.11.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on he environment if the project would result in:

N-1 Exposure of persons to or generation of noise levels in excess of standards established in the local General Plan or noise ordinance, or applicable standards of other agencies.

Based on local noise criteria as established by the City the following would be considered significant:

- Noise generated by buildout of the Proposed Land Use Plan would result in stationary (nontransportation) noise which exceeds the standards of the City's Municipal Code (see Table 5.11-4) at noise-sensitive receptors.
- New noise-sensitive development would be located in noise-impacted areas that exceed the exterior noise standard of the City's Land Use Compatibility Guidelines (see Table 5.11-3).
- New noise-sensitive development would be located in noise-impacted and result in interior noise levels in habitable noise-sensitive areas that exceed 45 dBA CNEL (see Table 5.11-3).

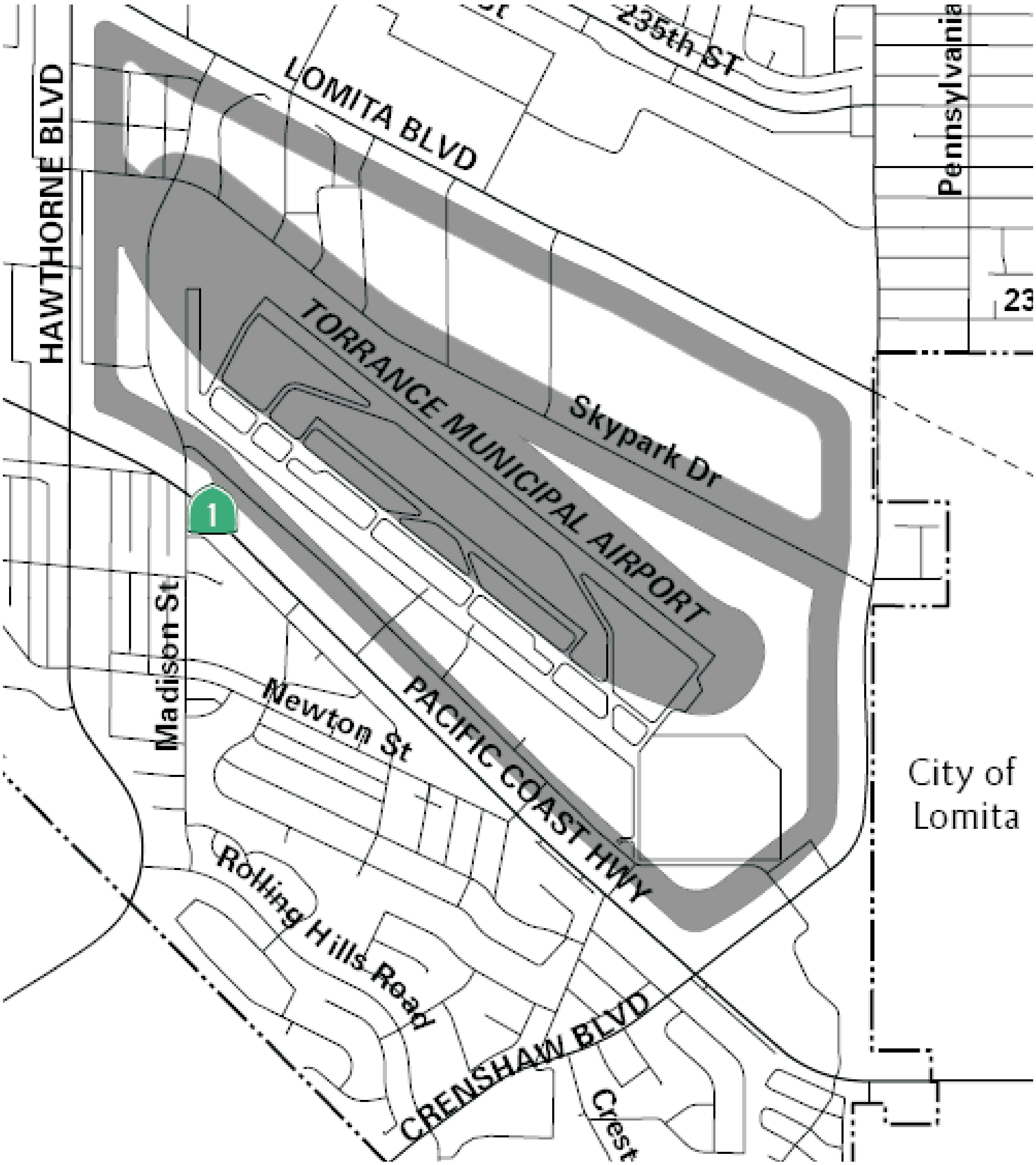
N-2 Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

N-3 A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

Based on noticeable changes in ambient noise levels the following would be considered significant:

- Project-related traffic would increase the CNEL at any noise-sensitive receptor by an audible amount of 3 dBA. A minimum 3 dB change in noise levels is necessary for human hearing to discern a change in noise levels.

Torrance Airport Noise Contour



60 CNEL Noise Contour

0 1,300
Scale (Feet)

Source: Torrance General Plan 2005

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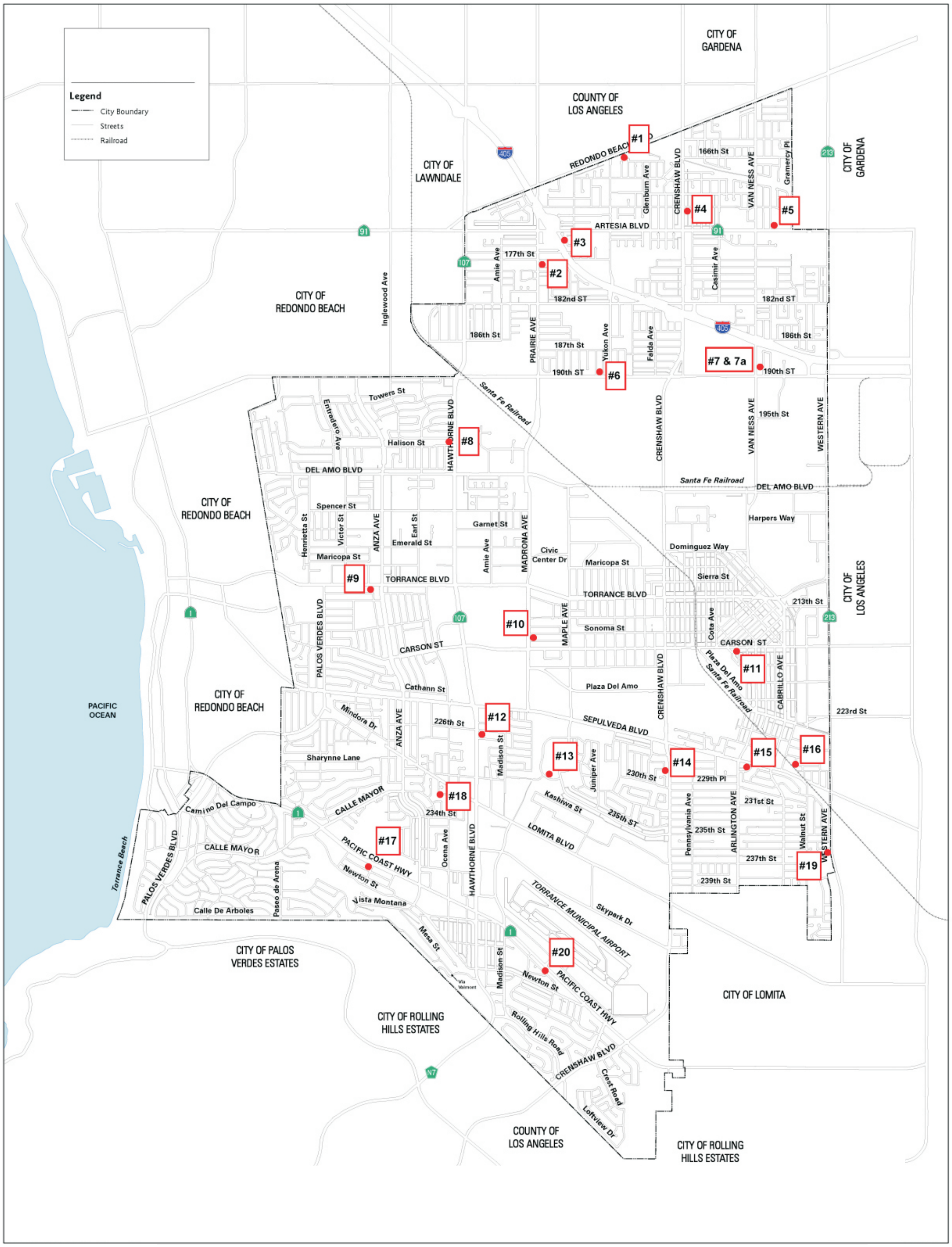
Noise Monitoring Locations



0 5,800
Scale (Feet)

Source: Torrance General Plan 2005

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N-4 A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

Based on local noise criteria as established in the City of Torrance Municipal Code the following would be considered significant:

- Construction activities substantially elevating the ambient noise environment at noise-sensitive uses for a substantial period of time; or occur outside of the hours specified (7:30 AM to 6:00 PM Monday through Friday and 9:00 AM to 5:00 PM on Saturday) under Municipal Code, Section 46.31 of the City of Torrance Municipal Code.

N-5 For a project located within an airport land use plan or where such a plan has not been adopted, within two miles of a public airport or public-use airport, exposure of people residing or working in the project area to excessive noise levels.

N-6 For a project within the vicinity of a private airstrip, exposure of people residing or working the project area to excessive noise levels.

5.11.3 Environmental Impacts

The following impact analysis addresses thresholds of significance for which the initial study disclosed potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement.

IMPACT 5.11-1 BUILDOUT OF THE PROPOSED LAND USE PLAN WOULD NOT RESULT IN A SUBSTANTIAL INCREASE IN THE EXISTING NOISE ENVIRONMENT. [THRESHOLDS N-1 AND N-3]

Impact Analysis: The operational phases of individual projects that result from the proposed land use plan may generate noise from stationary or vehicular sources. Noise is regulated by numerous codes and ordinances across federal, state, and local agencies. In addition, the City regulates stationary-source noise through the municipal code.

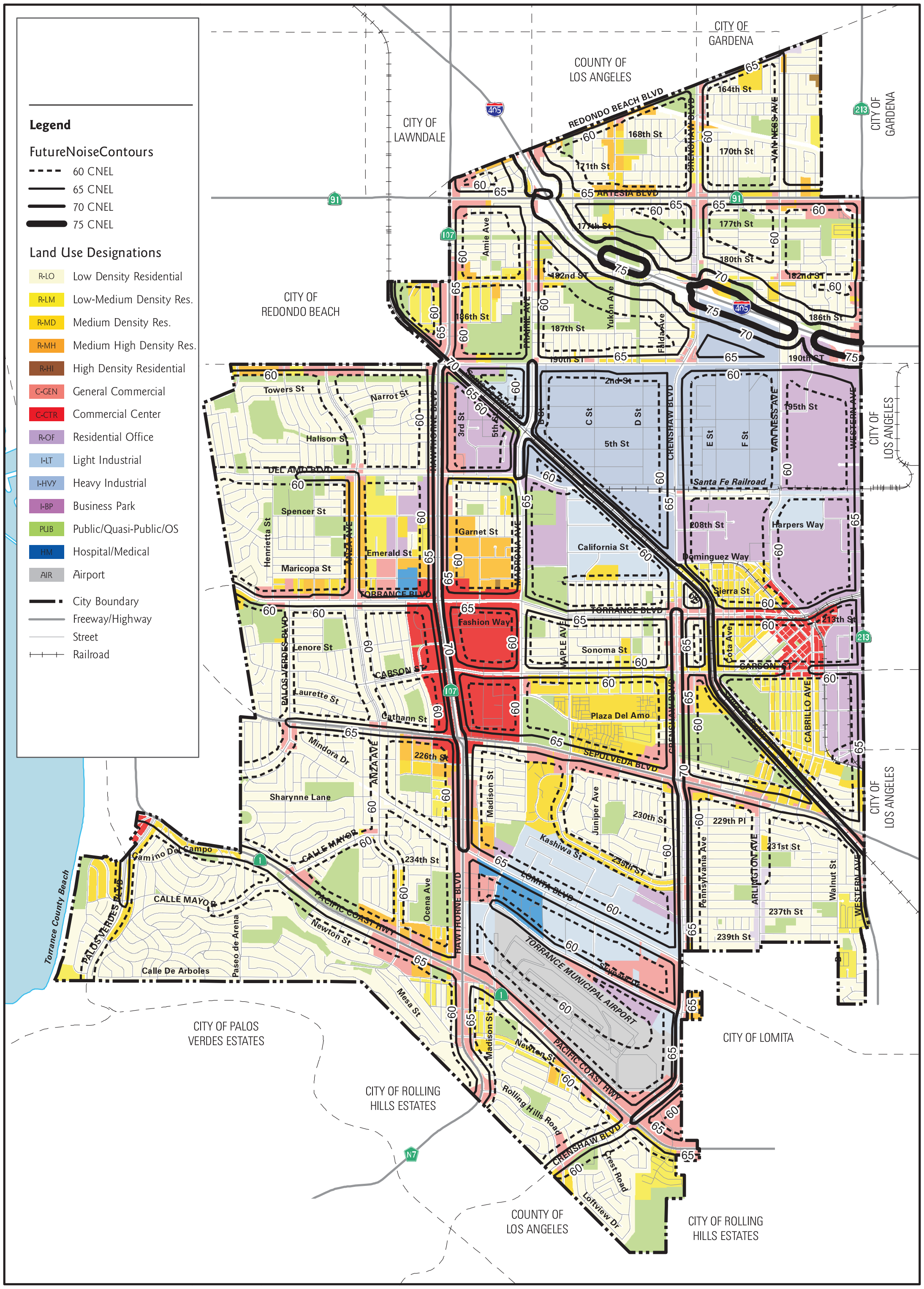
Stationary-Source Noise Impacts

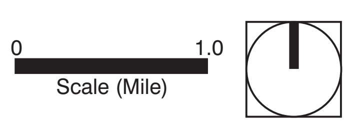
Buildout of the proposed land use plan would result in an increase in development within the City. The primary stationary-source noise associated with new development are landscaping, maintenance activities, and air conditioning systems. Noise generated by residential or commercial uses is generally short and intermittent, and these uses are not a substantial source of noise. Industrial noise is less intermittent and can have moderate to high levels on a continual basis. The Torrance General Plan update proposes 63,000 square feet of additional heavy-industrial land uses at buildout. Industrial areas are generally located south of I-405 and north of the BNSF railway. In addition, light industrial and hospital uses are located around the Torrance Airport. The siting of new industrial developments may increase noise levels at nearby uses. This can be due to the continual presence of heavy trucks used for the pick-up and delivery of goods and supplies, or from the use of noisy equipment used in the manufacturing or machining process. While vehicle noise on public roadways is exempt from local regulation, for the purposes of the planning process, it may be regulated as a stationary-source noise while operating on private property. Process equipment and the use of pneumatic tools could also generate elevated noise levels, but this equipment is typically housed within the facilities. To prevent stationary-source noise created by machinery and tools from affecting sensitive land uses, the City of Torrance requires stationary sources of noise to abide by the maximum allowable noise levels as described in the noise ordinance. Therefore, compliance with the City's noise ordinance (Chapter 6, Noise Regulations, of the City's municipal code) would result in noise levels that are acceptable to the City and would result in less than significant noise impacts from stationary sources.

Transportation Noise Impacts

Potential impacts from buildout of the proposed land use plan stem mainly from the addition of vehicles along roadways in the City and trains on the BNSF railway. Figure 5.11-5, *Future Transportation Noise Levels*, shows the noise contours from roadway traffic along major thoroughfares and the BNSF railway at buildout. Table 5.11-8 lists the increments in noise levels as a result of growth in the City. Because the majority of the City is built out, major increases in ambient noise levels are not anticipated. As shown in Table 5.11-8, the projected increase in ambient noise levels resulting from cumulative sources would not result in a change in ambient noise levels greater than 3 dBA along any of the street segments analyzed. In fact, at all located analyzed, noise levels are not expected to increase by more than 1 dBA. A 3 dB change in noise levels is considered to be the minimum change discernible to human hearing in outdoor environments. Consequently, no significant impacts would occur.

Future Transportation Noise Levels





Source: Torrance General Plan 2005

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Table 5.11-8
Future Noise Levels

	Average Daily Traffic	CNEL@ 50' From Near Lane C/L	Distance to Existing Contours From Near Lane Centerline, feet			Average Daily Traffic	CNEL@ 50' From Near Lane C/L	Distance to Existing Contours From Near Lane Centerline, feet			Increase from Existing
Arterial/Reach	2005	2005	60dB	65dB	70dB	2005	2005	60dB	65dB	70dB	dBA CNEL
182nd Street											
West City Limits to Hawthorne Boulevard	13,340	65.5	143	56	---	15,341	66.0	155	62	---	0.5
Hawthorne Boulevard to Prairie Avenue	9,510	64.0	110	---	---	10,937	64.5	120	---	---	0.5
Prairie Avenue to Yukon Avenue	17,568	66.5	170	69	---	20,203	67.0	185	75	---	0.5
Yukon Avenue to Crenshaw Boulevard	18,523	66.5	170	69	---	21,301	67.5	200	83	---	1.0
Crenshaw Boulevard to Van Ness Avenue	14,585	65.5	143	56	---	16,773	66.5	170	69	---	1.0
Van Ness Avenue to Western Avenue	16,041	66.0	155	62	---	18,447	66.5	170	69	---	0.5
190th Street											
West City Limits to Anza Avenue	36,912	69.5	278	120	---	42,449	70.0	300	130	50	0.5
Anza Avenue to Hawthorne Boulevard	36,281	70.5	320	143	56	41,723	71.0	340	155	62	0.5
Hawthorne Boulevard to Prairie Avenue	31,271	70.5	320	143	56	35,962	71.0	340	155	62	0.5
Prairie Avenue to Yukon Avenue	42,680	72.0	395	185	75	49,082	72.5	428	200	83	0.5
Yukon Avenue to Crenshaw Boulevard	50,466	73.0	460	215	90	58,036	73.5	490	235	100	0.5
Crenshaw Boulevard to Van Ness Avenue	35,737	71.0	340	155	62	41,098	71.5	368	170	69	0.5
Vane Ness Avenue to Western Avenue	38,899	71.5	368	170	69	44,734	72.0	395	185	75	0.5
223rd Street											
West of Western Avenue	15,395	67.0	185	75	---	17,704	67.5	200	83	---	0.5

Table 5.11-8
Future Noise Levels

Arterial/Reach	Average Daily Traffic 2005	CNEL@ 50' From Near Lane C/L 2005	Distance to Existing Contours From Near Lane Centerline, feet 60dB	65dB	70dB	Average Daily Traffic 2005	CNEL@ 50' From Near Lane C/L 2005	Distance to Existing Contours From Near Lane Centerline, feet 60dB	65dB	70dB	Increase from Existing dBA CNEL
235th Street											
Sepulveda Boulevard to Nadine Circle	11,285	66.0	155	62	---	12,978	66.5	170	69	---	0.5
Nadine Circle to Juniper Avenue	11,991	66.0	155	62	---	13,790	66.5	170	69	---	0.5
Juniper Avenue to Crenshaw Boulevard	11,832	66.0	155	62	---	13,607	66.5	170	69	---	0.5
Crenshaw Boulevard to Arlington Avenue	6,601	60.5	56	---	---	7,591	61.0	62	---	---	0.5
Arlington Avenue to Cabrillo Avenue	4,581	59.0	---	---	---	5,268	59.5	---	---	---	0.5
Anza Avenue											
190th Street to Del Amo Boulevard	25,750	68.0	215	90	---	29,613	68.5	235	100	---	0.5
Del Amo Boulevard to Torrance Boulevard	28,175	69.5	278	120	---	32,401	70.0	300	130	50	0.5
Torrance Boulevard to Lenore Street	25,682	68.0	215	90	---	29,534	68.5	235	100	---	0.5
Lenore Street to Carson Street	25,214	68.0	215	90	---	28,996	68.5	235	100	---	0.5
Carson Street to Sepulveda Boulevard	25,993	68.0	215	90	---	29,892	68.5	235	100	---	0.5
Sepulveda Boulevard to Calle Mayor	29,527	67.5	200	83	---	33,956	68.5	235	100	---	1.0
Calle Mayor to Pacific Coast Highway	12,658	64.0	110	---	---	14,557	64.5	120	---	---	0.5
Arlington Avenue											
Carson Street to Sepulveda Boulevard	6,455	62.5	83	---	---	7,423	63.0	90	---	---	0.5
Sepulveda Boulevard to 235th Street	16,113	68.5	235	100	---	18,530	69.0	255	110	---	0.5
Artesia Boulevard											
Hawthorne Boulevard to Prairie Avenue	32,855	71.5	368	170	69	37,783	72.5	428	200	83	1.0

Table 5.11-8
Future Noise Levels

Arterial/Reach	Average Daily Traffic 2005	CNEL@ 50' From Near Lane C/L 2005	Distance to Existing Contours From Near Lane Centerline, feet 60dB	65dB	70dB	Average Daily Traffic 2005	CNEL@ 50' From Near Lane C/L 2005	Distance to Existing Contours From Near Lane Centerline, feet 60dB	65dB	70dB	Increase from Existing dBA CNEL
Prairie Avenue to Yukon Avenue	39,180	72.5	428	200	83	45,057	73.0	460	215	90	0.5
Yukon Avenue to Crenshaw Boulevard	28,756	71.0	340	155	62	33,069	72.0	395	185	75	1.0
Crenshaw Boulevard to Van Ness Avenue	31,805	71.5	368	170	69	36,576	72.0	395	185	75	0.5
Van Ness Avenue to Western Avenue	35,516	72.0	395	185	75	40,843	72.5	428	200	83	0.5
Cabrillo Avenue											
Torrance Boulevard to Carson Street	13,122	62.0	75	---	---	15,090	63.0	90	---	---	1.0
Carson Street to Sepulveda Boulevard	8,891	60.5	56	---	---	10,225	61.0	62	---	---	0.5
Sepulveda Boulevard to 235th Street	5,992	62.0	75	---	---	6,891	62.5	83	---	---	0.5
Calle Mayor											
East of Palos Verdes Boulevard	5,855	62.0	64	---	---	6,733	62.5	67	---	---	0.5
West of Newton Street	11,738	65.0	130	50	---	13,499	65.5	143	56	---	0.5
Newton Street to Pacific Coast Highway	10,249	64.5	120	---	---	11,786	65.0	130	50	---	0.5
Pacific Coast Highway to Anza Avenue	15,240	65.0	130	50	---	17,526	65.5	143	56	---	0.5
Carson Street											
Palos Verdes Boulevard to Anza Avenue	5,855	63.0	90	---	---	6,733	63.5	100	---	---	0.5
Anza Avenue to Hawthorne Boulevard	13,791	65.5	143	56	---	15,860	66.0	155	62	---	0.5
Hawthorne Boulevard to Madrona Avenue	29,335	69.5	278	120	---	33,735	70.5	320	143	56	1.0
Madrona Avenue to Maple Avenue	28,534	68.5	235	100	---	32,814	69.0	255	110	---	0.5

Table 5.11-8
Future Noise Levels

Arterial/Reach	Average Daily Traffic 2005	CNEL@ 50' From Near Lane C/L 2005	Distance to Existing Contours From Near Lane Centerline, feet 60dB	65dB	70dB	Average Daily Traffic 2005	CNEL@ 50' From Near Lane C/L 2005	Distance to Existing Contours From Near Lane Centerline, feet 60dB	65dB	70dB	Increase from Existing dBA CNEL
Maple Avenue to Crenshaw Boulevard	30,441	69.0	255	110	---	35,007	69.5	278	120	---	0.5
Crenshaw Boulevard to Arlington Avenue	31,225	69.5	278	120	---	35,909	70.0	300	130	50	0.5
Arlington Avenue to Cabrillo Avenue	31,703	68.0	215	90	---	36,458	68.5	235	100	---	0.5
Cabrillo Avenue to Western Avenue	33,613	68.0	215	90	---	38,655	69.0	255	110	---	1.0
Crenshaw Boulevard											
Redondo Beach Boulevard to Artesia Boulevard	31,251	71.0	340	155	62	35,939	71.5	368	170	69	0.5
Artesia Boulevard to 182nd Street	35,093	71.5	368	170	69	40,357	72.0	395	185	75	0.5
182nd Street to 190th Street	58,156	73.0	460	215	90	66,879	73.5	490	235	100	0.5
190th Street to Del Amo Boulevard	48,649	73.0	460	215	90	55,946	73.5	490	235	100	0.5
Del Amo Boulevard to Maricopa Street	43,328	72.5	428	200	83	49,827	73.5	490	235	100	1.0
Maricopa Street to Torrance Boulevard	43,000	72.5	428	200	83	49,450	73.0	460	215	90	0.5
Torrance Boulevard to Carson Street	48,554	73.0	460	215	90	55,837	74.0	520	255	110	1.0
Carson Street to Sepulveda Boulevard	59,554	74.0	520	255	110	68,487	75.0	600	300	130	1.0
Sepulveda Boulevard to 235th Street	52,664	73.5	490	235	100	60,564	74.0	520	255	110	0.5
235th Street to Lomita Boulevard	52,300	73.5	490	235	100	60,145	74.0	520	255	110	0.5
Lomita Boulevard to Skypark Drive	45,663	73.5	490	235	100	52,512	74.5	560	278	120	1.0
Skypark Drive to Pacific Coast Highway	49,031	73.0	460	215	90	56,386	74.0	520	255	110	1.0
Pacific Coast Highway to South City Limit	34,384	72.5	428	200	83	39,542	73.0	460	215	90	0.5

Table 5.11-8
Future Noise Levels

Arterial/Reach	Average Daily Traffic 2005	CNEL@ 50' From Near Lane C/L 2005	Distance to Existing Contours From Near Lane Centerline, feet 60dB	65dB	70dB	Average Daily Traffic 2005	CNEL@ 50' From Near Lane C/L 2005	Distance to Existing Contours From Near Lane Centerline, feet 60dB	65dB	70dB	Increase from Existing dBA CNEL
Del Amo Boulevard											
West City Limit to Entradero Avenue	15,511	67.0	185	75	---	17,838	67.5	200	83	---	0.5
Entradero Avenue to Anza Avenue	17,650	68.5	235	100	---	20,298	69.0	255	110	---	0.5
Anza Avenue to Hawthorne Boulevard	18,316	68.0	215	90	---	21,063	68.5	235	100	---	0.5
Hawthorne Boulevard to Prairie Avenue	20,716	68.5	235	100	---	23,823	69.0	255	110	---	0.5
Prairie Avenue to Maple Avenue	10,973	65.5	143	56	---	12,619	66.5	170	69	---	1.0
Crenshaw Boulevard to Van Ness Avenue	9,652	64.0	110	---	---	11,100	64.5	120	---	---	0.5
Van Ness Avenue to Western Avenue	9,481	64.0	110	---	---	10,903	64.5	120	---	---	0.5
Emerald Street											
Henrietta Street to Victor Street	700	52.0	---	---	---	805	52.5	---	---	---	0.5
Victor Street to Anza Avenue	3,653	58.0	---	---	---	4,201	59.0	---	---	---	1.0
Anza Avenue to Hawthorne Boulevard	5,778	60.0	50	---	---	6,645	60.5	56	---	---	0.5
East of Hawthorne Boulevard	7,220	61.0	62	---	---	8,303	61.5	69	---	---	0.5
West of Prairie Avenue	5,532	60.0	50	---	---	6,362	60.5	56	---	---	0.5
Entradero Street											
190th Street to Del Amo Boulevard	3,864	58.5	---	---	---	4,444	59.0	---	---	---	0.5
Hawthorne Boulevard											
Redondo Beach Boulevard to Artesia Boulevard	54,227	71.5	368	170	69	62,361	72.0	395	185	75	0.5
Artesia Boulevard to 182nd Street	64,510	72.5	428	200	83	74,187	73.0	460	215	90	0.5
182nd Street to 190th Street	64,415	72.0	395	185	75	74,077	73.0	460	215	90	1.0
190th Street to Del Amo Boulevard	66,561	73.5	490	235	100	76,545	74.5	560	278	120	1.0

Table 5.11-8
Future Noise Levels

	Average Daily Traffic	CNEL@ 50' From Near Lane C/L	Distance to Existing Contours From Near Lane Centerline, feet			Average Daily Traffic	CNEL@ 50' From Near Lane C/L	Distance to Existing Contours From Near Lane Centerline, feet			Increase from Existing
Arterial/Reach	**2005**	**2005**	**60dB**	**65dB**	**70dB**	**2005**	**2005**	**60dB**	**65dB**	**70dB**	**dBA CNEL**
Del Amo Boulevard to Torrance Boulevard	65,625	73.5	490	235	100	75,469	74.5	560	278	120	1.0
Torrance Boulevard to Carson Street	69,040	73.5	490	235	100	79,396	74.5	560	278	120	1.0
Carson Street to Sepulveda Boulevard	63,226	73.5	490	235	100	72,710	74.0	520	255	110	0.5
South of Sepulveda Boulevard	70,912	74.0	520	255	110	81,549	74.5	560	278	120	0.5
North of Lomita Boulevard	67,446	73.5	490	235	100	77,563	74.5	560	278	120	1.0
Lomita Boulevard to Skypark Drive	54,008	72.5	428	200	83	62,109	73.5	490	235	100	1.0
Skypark Drive to Pacific Coast Highway	48,832	72.0	395	185	75	56,157	73.0	460	215	90	1.0
Pacific Coast Highway to South City Limit	38,342	71.0	340	155	62	44,093	71.5	368	170	69	0.5
Henrietta Street											
Torrance Boulevard to Del Amo Boulevard	4,153	61.5	69	---	---	4,776	62.5	83	---	---	1.0
Lomita Boulevard											
Anza Avenue to Hawthorne Boulevard	14,908	66.0	155	62	---	17,144	66.5	170	69	---	0.5
Hawthorne Boulevard to Madison Street	36,422	72.0	395	185	75	41,885	72.5	428	200	83	0.5
Madison Street to Crenshaw Boulevard	35,502	72.5	428	200	83	40,827	73.0	460	215	90	0.5
Madison Street											
Lomita Boulevard to Pacific Coast Highway	13,511	65.5	80	54	---	15,538	66.0	82	57	---	0.5
Madrona Avenue											
Del Amo Boulevard to Torrance Boulevard	29,142	70.0	300	130	50	33,513	70.5	320	143	56	0.5

Table 5.11-8
Future Noise Levels

	Average Daily Traffic	CNEL@ 50' From Near Lane C/L	Distance to Existing Contours From Near Lane Centerline, feet			Average Daily Traffic	CNEL@ 50' From Near Lane C/L	Distance to Existing Contours From Near Lane Centerline, feet			Increase from Existing
Arterial/Reach	**2005**	**2005**	**60dB**	**65dB**	**70dB**	**2005**	**2005**	**60dB**	**65dB**	**70dB**	**dBA CNEL**
Torrance Boulevard to Carson Street	30,466	70.0	300	130	50	35,036	70.5	320	143	56	0.5
Carson Street to Sepulveda Boulevard	20,197	67.0	185	75	---	23,227	67.5	200	83	---	0.5
224th Street to 229th Street	220	51.5	---	---	---	253	51.5	---	---	---	0.0
Maple Avenue											
Del Amo Boulevard to Columbia Street	9,737	61.0	62	---	---	11,198	61.5	69	---	---	0.5
Columbia Street to Maricopa Street	10,013	61.0	62	---	---	11,515	61.5	69	---	---	0.5
Maricopa Street to Torrance Boulevard	10,639	62.5	83	---	---	12,235	63.0	90	---	---	0.5
Torrance Boulevard to Carson Street	8,150	61.5	69	---	---	9,373	62.0	75	---	---	0.5
Carson Street to Sepulveda Boulevard	9,490	61.0	57	---	---	10,914	61.5	61	---	---	0.5
Maricopa Street											
Maple Avenue to Crenshaw Boulevard	7,233	64.0	110	---	---	8,318	64.5	120	---	---	0.5
Newton Street											
Calle Mayor to Vista Montana	2,898	57.5	---	---	---	3,333	58.0	---	---	---	0.5
East of Vista Montana	6,253	60.5	56	---	---	7,191	61.0	62	---	---	0.5
West of Hawthorne Boulevard	3,678	58.5	---	---	---	4,230	59.0	---	---	---	0.5
Ocean Avenue											
Torrance Boulevard to Carson Street	1,474	55.0	---	---	---	1,695	55.5	---	---	---	0.5
Carson Street to Sepulveda Boulevard	424	50.5	---	---	---	488	51.0	---	---	---	0.5
Sepulveda Boulevard to Lomita Boulevard	7,920	61.5	69	---	---	9,108	62.0	75	---	---	0.5

Table 5.11-8
Future Noise Levels

Arterial/Reach	Average Daily Traffic 2005	CNEL@ 50' From Near Lane C/L 2005	Distance to Existing Contours From Near Lane Centerline, feet 60dB	65dB	70dB	Average Daily Traffic 2005	CNEL@ 50' From Near Lane C/L 2005	Distance to Existing Contours From Near Lane Centerline, feet 60dB	65dB	70dB	Increase from Existing dBA CNEL
Lomita Boulevard to Pacific Coast Highway	3,858	58.5	---	---	---	4,437	59.0	---	---	---	0.5
Pacific Coast Highway											
West of Palos Verdes Boulevard	26,780	70.5	320	143	56	30,797	71.5	368	170	69	1.0
Palos Verdes Boulevard to Calle Mayor	33,091	71.5	368	170	69	38,055	72.0	395	185	75	0.5
Calle Mayor to Ocean Avenue	33,564	71.5	368	170	69	38,599	72.5	428	200	83	1.0
Ocean Avenue to Hawthorne Boulevard	42,497	72.5	428	200	83	48,872	73.5	490	235	100	1.0
Hawthorne Boulevard to Madison Street	41,269	73.0	460	215	90	47,459	73.5	490	235	100	0.5
Madison Street to Crenshaw Boulevard	39,566	72.5	428	200	83	45,501	73.0	460	215	90	0.5
Crenshaw Boulevard to East City Limit	48,110	72.0	395	185	75	55,327	72.5	428	200	83	0.5
Palos Verdes Boulevard											
Torrance Boulevard to Sepulveda Boulevard	8,206	63.5	100	---	---	9,437	64.0	110	---	---	0.5
South of Sepulveda Boulevard	14,232	66.0	155	62	---	16,367	66.5	170	69	---	0.5
North of Pacific Coast Highway	13,964	64.5	120	---	---	16,059	65.0	130	50	---	0.5
Pacific Coast Highway to Catalina Avenue	21,496	66.5	170	69	---	24,720	67.0	185	75	---	0.5
Catalina Avenue to Calle Miramar	24,766	68.5	235	100	---	28,481	69.0	255	110	---	0.5
Calle Miramar to Calle Mayor	23,003	66.5	170	69	---	26,453	67.0	185	75	---	0.5
Calle Mayor to South City Limit	17,997	66.5	170	69	---	20,697	67.5	200	83	---	1.0
Prairie Avenue											
Redondo Beach Boulevard to Artesia Boulevard	48,732	71.0	340	155	62	56,042	71.5	368	170	69	0.5

Table 5.11-8
Future Noise Levels

	Average Daily Traffic	CNEL@ 50' From Near Lane C/L	Distance to Existing Contours From Near Lane Centerline, feet			Average Daily Traffic	CNEL@ 50' From Near Lane C/L	Distance to Existing Contours From Near Lane Centerline, feet			Increase from Existing
Arterial/Reach	**2005**	**2005**	**60dB**	**65dB**	**70dB**	**2005**	**2005**	**60dB**	**65dB**	**70dB**	**dBA CNEL**
Artesia Boulevard to 182nd Street	56,200	71.5	368	170	69	64,630	72.0	395	185	75	0.5
182nd Street to 190th Street	38,000	71.0	340	155	62	43,700	71.5	368	170	69	0.5
190th Street to Del Amo Boulevard	50,126	73.0	460	215	90	57,645	74.0	520	255	110	1.0
Redondo Beach Boulevard											
Hawthorne Boulevard to I-405	21,260	67.0	185	75	---	24,449	68.0	215	90	---	1.0
I-405 to Yukon Avenue	34,270	70.5	320	143	56	39,411	71.0	340	155	62	0.5
Yukon Avenue to Crenshaw Boulevard	30,834	69.0	255	110	---	35,459	69.5	278	120	---	0.5
Crenshaw Boulevard to Van Ness Avenue	29,080	69.5	278	120	---	33,442	70.5	320	143	56	1.0
Rolling Hills Road											
Hawthorn Boulevard to Crenshaw Boulevard	9,879	64.0	---	---	---	11,361	64.5	---	---	---	0.5
Sepulveda Boulevard											
West of Palos Verdes Boulevard	14,940	67.0	86	64	---	17,181	67.5	88	67	---	0.5
Palos Verdes Boulevard to Anza Avenue	24,016	70.0	300	130	50	27,618	70.5	320	143	56	0.5
Anza Avenue to Hawthorne Boulevard	27,465	69.5	278	120	---	31,585	70.0	300	130	50	0.5
Hawthorne Boulevard to Madrona Avenue	42,431	71.5	368	170	69	48,796	72.0	395	185	75	0.5
Madrona Avenue to Maple Avenue	48,668	73.0	460	215	90	55,968	73.5	490	235	100	0.5
Maple Avenue to Crenshaw Boulevard	41,488	71.5	368	170	69	47,711	72.0	395	185	75	0.5
Crenshaw Boulevard to Arlington Avenue	47,517	72.0	395	185	75	54,645	72.5	428	200	83	0.5

Table 5.11-8
Future Noise Levels

Arterial/Reach	Average Daily Traffic 2005	CNEL@ 50' From Near Lane C/L 2005	Distance to Existing Contours From Near Lane Centerline, feet 60dB	65dB	70dB	Average Daily Traffic 2005	CNEL@ 50' From Near Lane C/L 2005	Distance to Existing Contours From Near Lane Centerline, feet 60dB	65dB	70dB	Increase from Existing dBA CNEL
Arlington Avenue to Cabrillo Avenue	48,541	73.0	460	215	90	55,822	73.5	490	235	100	0.5
Cabrillo Avenue to Western Avenue	47,053	72.0	395	185	75	54,111	72.5	428	200	83	0.5
Skypark Drive											
East of Madison Avenue	20,965	68.5	235	100	---	24,110	69.0	255	110	---	0.5
West of Crenshaw Boulevard	21,885	68.5	235	100	---	25,168	69.0	255	110	---	0.5
Spencer Street											
Victor Street to Anza Avenue	4,940	59.5	---	---	---	5,681	60.0	50	---	---	0.5
Anza Avenue to Hawthorne Boulevard	5,135	59.5	---	---	---	5,905	60.0	50	---	---	0.5
Torrance Boulevard											
West City Limit to Henrietta Street	27,000	69.5	278	120	---	31,050	70.0	300	130	50	0.5
Henrietta Street to Victor Street	32,181	70.5	320	143	56	37,008	71.0	340	155	62	0.5
Victor Street to Anza Avenue	32,148	71.0	340	155	62	36,970	72.0	395	185	75	1.0
Anza Avenue to Hawthorne Boulevard	32,207	70.5	320	143	56	37,038	71.0	340	155	62	0.5
Hawthorne Boulevard to Madrona Avenue	35,746	71.0	340	155	62	41,108	71.5	368	170	69	0.5
Madrona Avenue to Maple Avenue	36,884	70.5	320	143	56	42,417	71.5	368	170	69	1.0
Maple Avenue to Crenshaw Boulevard	33,987	69.5	278	120	---	39,085	70.0	300	130	50	0.5
Crenshaw Boulevard to Arlington Avenue	37,114	69.5	278	120	---	42,681	70.5	320	143	56	1.0
Arlington Avenue to Van Ness Avenue	33,019	70.0	300	130	50	37,972	71.0	340	155	62	1.0
Van Ness Avenue to Western Avenue	30,120	68.5	235	100	---	34,638	69.5	278	120	---	1.0

Table 5.11-8
Future Noise Levels

	Average Daily Traffic	CNEL@ 50' From Near Lane C/L	Distance to Existing Contours From Near Lane Centerline, feet			Average Daily Traffic	CNEL@ 50' From Near Lane C/L	Distance to Existing Contours From Near Lane Centerline, feet			Increase from Existing
Arterial/Reach	**2005**	**2005**	**60dB**	**65dB**	**70dB**	**2005**	**2005**	**60dB**	**65dB**	**70dB**	**dBA CNEL**
Van Ness Avenue											
South of Redondo Beach Boulevard	12,875	65.0	130	50	---	14,806	65.5	143	56	---	0.5
North of Artesia Boulevard	13,972	65.5	143	56	---	16,068	66.0	155	62	---	0.5
Artesia Boulevard to 182nd Street	15,797	66.0	155	62	---	18,167	66.5	170	69	---	0.5
182nd Street to I-405	14,160	65.5	143	56	---	16,284	66.0	155	62	---	0.5
I-405 to 190th Street	15,714	66.0	155	62	---	18,071	66.5	170	69	---	0.5
190th Street to Del Amo Boulevard	18,485	67.5	200	83	---	21,258	68.5	235	100	---	1.0
Del Amo Boulevard to Torrance Boulevard	15,507	66.0	155	62	---	17,833	66.5	170	69	---	0.5
Victor Street											
Del Amo Boulevard to Torrance Boulevard	4,420	62.0	75	---	---	5,083	62.5	83	---	---	0.5
Western Avenue											
Artesia Boulevard to 182nd Street	31,867	70.0	300	130	50	36,647	71.0	340	155	62	1.0
182nd Street to 190th Street	32,493	71.0	340	155	62	37,367	72.0	395	185	75	1.0
190th Street to Del Amo Boulevard	42,751	72.5	428	200	83	49,164	73.0	460	215	90	0.5
Del Amo Boulevard to Torrance Boulevard	33,508	71.5	368	170	69	38,534	72.0	395	185	75	0.5
Torrance Boulevard to Carson Street	32,172	71.0	340	155	62	36,998	71.5	368	170	69	0.5
Carson Street to Sepulveda Boulevard	34,588	71.5	368	170	69	39,776	72.0	395	185	75	0.5
Sepulveda Boulevard to 235th Street	32,449	71.0	340	155	62	37,316	71.5	368	170	69	0.5
South of 235th Street	31,749	71.0	340	155	62	36,511	71.5	368	170	69	0.5

Table 5.11-8
Future Noise Levels

	Average Daily Traffic	CNEL@ 50' From Near Lane C/L	Distance to Existing Contours From Near Lane Centerline, feet			Average Daily Traffic	CNEL@ 50' From Near Lane C/L	Distance to Existing Contours From Near Lane Centerline, feet			Increase from Existing
Arterial/Reach	**2005**	**2005**	**60dB**	**65dB**	**70dB**	**2005**	**2005**	**60dB**	**65dB**	**70dB**	**dBA CNEL**
Yukon Avenue											
Redondo Beach Boulevard to Artesia Boulevard	4,949	59.5	---	---	---	5,691	60.0	50	---	---	0.5
Artesia Boulevard to 182nd Street	3,995	58.5	---	---	---	4,594	59.0	---	---	---	0.5
182nd Street to 190th Street	3,576	58.0	---	---	---	4,112	58.5	---	---	---	0.5
I-405 Freeway[1]											
Redondo Beach Boulevard to Crenshaw Boulevard	248,000	84.5	1,575	1,000	560	285,200	85.0	1,650	1,050	600	0.5
Crenshaw Boulevard to Western Avenue	255,000	84.5	1,575	1,000	560	293,250	85.0	1,650	1,050	600	0.5
I-405 Freeway[2]											
Redondo Beach Boulevard to Crenshaw Boulevard	248,000	78.5	905	490	98	285,200	79.0	950	520	195	0.5
Crenshaw Boulevard to Western Avenue	255,000	78.5	905	490	98	293,250	79.0	950	520	195	0.5

* Arterial Types: 1) 2 lanes, 35 mph or less; 2) 2 lanes, 40 mph; 3) 2 lanes, 45 mph or more; 4) 4–6 lanes, 35 mph or less; 5) 4–6 lanes, 40 mph; 6) 4–6 lanes, 45 mph or more; 7) 4–6 lane freeway, 55 mph or more; 8) 8-lane freeway, 55 mph or more.
Notes: AT, ABOVE, and BELOW refer to the elevation of the arterial relative to the surrounding area.
[1] Noise levels without a sound wall.
[2] Noise levels with a sound wall.

IMPACT 5.11-2 NOISE-SENSITIVE USES COULD BE EXPOSED TO ELEVATED NOISE LEVELS FROM TRANSPORTATION SOURCES. [THRESHOLDS N-1 AND N-3]

Impact Analysis: An impact could be significant if the proposed land use plan provides for noise-sensitive land uses to be located in areas where future noise levels are project to exceed levels considered appropriate for that use, per the City's noise/land use compatibility criteria. The City applies the Torrance Land Use Compatibility Guidelines to new development, summarized in Table 5.11-3, for the purpose of assessing the compatibility of new development with existing noise sources, such as roadway noise. It is the policy of the City of Torrance to require new noise-sensitive single-family residential developments to achieve an exterior noise environment of up to 65 dBA CNEL and multifamily residential developments to achieve an exterior noise environment of up to 70 dBA CNEL with inclusion of noise-reduction features in the project design and construction. However, ambient noise levels that exceed 65 dBA CNEL are only significant if they encroach into noise-sensitive land uses (schools, playgrounds and parks, and residential uses). Commercial and industrial areas are not considered noise sensitive and have much higher tolerances for exterior noise levels. The building interior of noise-sensitive structures is required to achieve noise levels of 45 dBA CNEL under the California Building Code, and Title 21 of the California Code of Regulations, for noise-sensitive structures within the 65 dBA CNEL contour of an airport. While interior areas can be mitigated to achieve acceptable interior noise levels, it may not be possible to achieve the noise compatibility criteria for noise-sensitive exterior areas.

The noise contours for projected buildout year 2030 conditions are presented in Figure 5.11-5, which show the future noise levels from transportation noise sources. Any siting of new noise-sensitive land uses within a noise environment that exceeds the normally acceptable land use compatibility criterion (see Table 5.11-3) represents a potentially significant impact and would require a separate noise study through the development review process to determine the level of impacts and required mitigation. To ensure the compatibility of new development in the City, the noise element contains a number of policies to minimize potential impacts on sensitive land uses. Because noise-sensitive land uses would potentially be exposed to noise levels that exceed the City's normally acceptable land use compatibility criterion, impacts would be significant.

IMPACT 5.11-3: CONSTRUCTION ACTIVITIES ASSOCIATED WITH BUILDOUT OF THE INDIVIDUAL LAND USES ASSOCIATED WITH THE PROPOSED LAND USE PLAN WOULD EXPOSE SENSITIVE USES TO STRONG LEVELS OF GROUNDBORNE VIBRATION. [THRESHOLD N-2]

Impact Analysis: Construction operations can generate varying degrees of ground vibration, depending on the construction procedures and equipment. Operation of construction equipment generates vibrations that spread through the ground and diminish with distance from the source. The effect on buildings in the vicinity of the construction site varies depending on soil type, ground strata, and receptor building construction. The results from vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibrations at moderate levels, and slight structural damage at the highest levels. Vibration from construction activities rarely reaches the levels that can damage structures, but can achieve the audible and perceptible ranges in buildings close to the construction site. Table 5.11-9 lists vibration levels for construction equipment.

Table 5.11-9
Vibration Levels for Construction Equipment

Equipment	Approximate Velocity Level at 25 Feet (VdB)	Approximate RMS[1] Velocity at 25 Feet (in/sec)
Pile Driver (impact) Upper Range	112	1.518
Pile Driver (impact) Lower Range	104	0.644
Pile Driver (sonic) Upper Range	105	0.734
Pile Driver (sonic) Lower Range	93	0.170
Large Bulldozer	87	0.089
Caisson Drilling	87	0.089
Jackhammer	79	0.035
Small Bulldozer	58	0.003
Loaded Trucks	86	0.076
FTA Criteria – Human Annoyance (Daytime)	78	—
FTA Criteria – Structural Damage	—	0.200

Source: FTA 2006
[1] RMS velocity calculated from vibration level (VdB) using the reference of 1 microinch/second.

As shown in Table 5.11-9, vibration generated by construction equipment has the potential to be substantial. However, groundborne vibration is almost never annoying to people who are outdoors, so it is usually evaluated in terms of indoor receivers (FTA 2006). Significant vibration impacts may occur from construction equipment associated with development in accordance with the Torrance General Plan update due to the potential for vibration-generating construction equipment being used in proximity to vibration-sensitive uses.

IMPACT 5.11-4: VIBRATION-SENSITIVE LAND USES COULD BE EXPOSED TO STRONG LEVELS OF GROUNDBORNE VIBRATION. [THRESHOLD N-2]

Impact Analysis:

On-Road Mobile-Source Vibration Impacts

Caltrans has studied the effects of propagation of vehicle vibration on sensitive land uses and notes that "heavy trucks, and quite frequently buses, generate the highest earthborne vibrations of normal traffic." Caltrans further notes that the highest traffic-generated vibrations are along freeways and state routes. Their study finds that "vibrations measured on freeway shoulders (five meters from the centerline of the nearest lane) have never exceeded 0.08 inch per second, with the worst combinations of heavy trucks. This level coincides with the maximum recommended safe level for ruins and ancient monuments (and historic buildings)." Typically, trucks do not generate high levels of vibration because they travel on rubber wheels and do not have vertical movement, which generates ground vibration. Vibrations from trucks may be noticeable if there are any roadway imperfections such as potholes (FTA 2006). Because vibration-sensitive structures are not and will not be sited within five meters (approximately 16 feet) of the centerline of the nearest lane of I-405, or any major truck route (see Figure 5.15-4, *Truck and Rail Routes*), any potential for significant vibration impacts is less than significant.

Railroad Vibration Impacts

New vibration-sensitive land uses, including residential land uses, would be exposed to groundborne vibration from train operations along the BNSF. Vibration levels in the City from trains are dependant on specific site conditions such as geology and the condition of the railroad track and train wheels. In addition, wood-framed structures could amplify vibration levels felt by occupants by as much as 10 dB. As soil conditions have a strong influence on the levels of groundborne vibration, vibration levels from trains may be amplified. Vibration impacts from the BNSF are based on the potential for rail operations to cause perceptible levels of vibration. In addition, the FTA determines impacts based on the frequency of train passbys on the railway. For frequent events, defined more than 70 VdB vibration events per day, are considered potentially significant if they generate vibration levels of 72 VdB at residences and building where people normally sleep. Freight trains generate vibration levels of 90 VdB at a distance of 25 feet from the tracks. Consequently, vibration levels of 72 VdB can be felt at up to 200 feet from the railway. The proposed General Plan does not indicate the exact locations of new vibration-sensitive development. Consequently, there is a potential for new vibration-sensitive land uses to be constructed within 200 feet from the rail line, which has the potential to be impacted by perceptible levels of vibration from rail operations. Consequently, vibration impacts from train operations could be potentially significant.

Industrial Vibration Impacts

The use of heavy equipment associated with industrial operations, including operation of jet engine test stands, can create elevated vibration levels in their immediate proximity. Soil conditions have a strong influence on the levels of groundborne vibration. However, groundborne vibration is almost never annoying to people who are outdoors, so it is usually evaluated in terms of indoor receivers (FTA 2006). In general, the majority of industrial uses would not be immediately adjacent to vibration-sensitive uses. Use of heavy equipment associated with industrial activities would occur indoors. Vibration-intensive equipment in a manufacturing zone is required to be constructed so as to not be perceptible at or beyond the property line, without the aid of instruments (Torrance Municipal Code Section 91.32.1). Consequently, no significant impacts would occur in this regard.

IMPACT 5.11-5: CONSTRUCTION ACTIVITIES ASSOCIATED WITH BUILDOUT OF THE INDIVIDUAL LAND USES OF THE PROPOSED LAND USE PLAN WOULD SUBSTANTIALLY ELEVATE NOISE LEVELS IN THE VICINITY OF NOISE-SENSITIVE LAND USES. [THRESHOLD N-4]

Impact Analysis: Two types of short-term noise impacts could occur during construction. First, the transport of workers and movement of materials to and from the site could incrementally increase noise levels along local access roads. However, the amount of construction traffic is typically small in relation to the total daily traffic volumes on those roadway segments.

The second type of short-term noise impact is related to demolition, site preparation, grading, and/or physical construction. Construction is performed in distinct steps, each of which has its own mix of equipment, and, consequently, its own noise characteristics. However, despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase. Table 5.11-10 lists typical construction equipment noise levels recommended for noise-impact assessments, based on a distance of 50 feet between the equipment and noise receptor.

Table 5.11-10
Construction Equipment Noise Emission Levels

Construction Equipment	Typical Noise Level (dBA) at 50 Feet from the Source	Construction Equipment	Typical Noise Level (dBA) at 50 Feet from the Source
Air Compressor	81	Pile-Driver (Impact)	101
Backhoe	80	Pile-Driver (Sonic)	96
Ballast Equalizer	82	Pneumatic Tool	85
Ballast Tamper	83	Pump	76
Compactor	82	Rail Saw	90
Concrete Mixer	85	Rock Drill	98
Concrete Pump	71	Roller	74
Concrete Vibrator	76	Saw	76
Crane, Derrick	88	Scarifier	83
Crane, Mobile	83	Scraper	89
Dozer	85	Shovel	82
Generator	81	Spike Driver	77
Grader	85	Tie Cutter	84
Impact Wrench	85	Tie Handler	80
Jack Hammer	88	Tie Inserter	85
Loader	85	Truck	88
Paver	89		

Source: FTA 2006

Composite construction noise is best characterized by Bolt, Beranek, and Newman (1971). In their study, construction noise for development ranges from 71 to 89 dBA L_{eq} when measured at a distance of 50 feet from the construction effort. These values take into account both the number of pieces and spacing of the heavy equipment used in the construction effort. In later phases during building assembly, noise levels are typically reduced from these values and the physical structures further break up line-of-sight noise propagation. Construction of individual developments associated with buildout of the proposed land use plan would temporarily increase the ambient noise environment. However, the City of Torrance restricts the hours of construction activities to the least noise-sensitive portions of the day. According to the municipal code, construction activities are restricted to 7:30 AM to 6:00 PM Monday through Friday and 9:00 AM to 5:00 PM on Saturday. Properties zoned as commercial, industrial, or within an established redevelopment district may conduct construction activities outside of these hours if a minimum buffer of 300 feet is maintained to the closest residential property, unless construction noise exceeds 50 dBA. In addition, construction activities may occur outside of these hours if the City determines unusual circumstances exist. Because construction activities associated with any individual development may occur near noise-sensitive receptors and noise disturbances may occur for prolonged periods of time, construction noise impacts from buildout of the proposed land use plan are considered significant.

IMPACT 5.11-6: ***NOISE-SENSITIVE LAND USES WOULD NOT BE LOCATED WITHIN THE 60 dBA CNEL NOISE CONTOUR OF THE TORRANCE AIRPORT; THEREFORE, NOISE-SENSITIVE LAND USES WOULD NOT BE EXPOSED TO SUBSTANTIAL LEVELS OF AIRPORT-RELATED NOISE. [THRESHOLD N-5 AND N-6]***

Impact Analysis: Aircraft overflights, takeoffs, and landings in the City of Torrance contribute to the ambient noise environment. Each of these events results exposes sensitive receptors to elevated noise levels near the Torrance Municipal Airport or other public and private heliports in the City.

Torrance Airport

Title 21 of the California Code of Regulations establishes that 65 dBA CNEL is the acceptable level of aircraft noise for persons living within the vicinity of an airport. Title 21 requires that adequate acoustical insulation is provided for noise-sensitive uses within the 65 dBA CNEL contour to ensure that interior noise levels achieve 45 dBA CNEL. Sensitive areas in an airport noise environment that exceeds 65 dBA would be required to conduct a noise assessment and mitigate, as feasible, to achieve an exterior environment of 65 dBA CNEL. However, because of low levels of airport activity, the 65 dBA CNEL noise contour for Torrance Airport is not reported because it does not extend into the City of Torrance. As shown in Figure 5.11-3, the 60 dBA CNEL noise contour is confined to the area south of Lomita Boulevard and north of PCH. Therefore, no significant airport impacts would occur. Furthermore, areas surrounding the airport influence area of the Torrance Airport are designated as General Commercial, Hospital (exterior), Light Industrial, and Business Park in the proposed land use plan, which are not considered a noise-sensitive land uses. Because the proposed land use plan would not designate any noise-sensitive uses within the 65 dBA CNEL contour of the Torrance Airport, no significant impacts would occur.

Heliports

In addition to the Torrance Airport, public and private heliports in the City also generate noise. Development of public and private heliports is regulated by the Federal Aviation Administration. Helicopters typically take off and land into the wind and fly approximately 500 to 1,000 feet above ground level. When helicopters land, they descend at approximately 1,000 feet per minute. While single-event noise produced when a helicopter passes overhead can substantially elevate the ambient noise environment, intermittent flyovers by helicopters are not considered a substantial source of noise in the City, and no significant impacts would occur.

5.11.4 Relevant General Plan Update Policies

Noise Element

Noise Abatement

- Continue to strictly enforce the provisions of the City's Noise Ordinance to ensure that stationary noise, traffic-related noise, railroad noise, airport-related noise, and noise emanating from construction activities and special events are minimized. (Policy N.1.1)
- Maintain a workable, reasonable, and effective noise ordinance. Update the ordinance as necessary to respond to community noise issues. (Policy N.1.2)
- Seek grants and loans for noise abatement projects. (Policy N.1.3)

- Minimize unnecessary outdoor noise through enforcement of the noise ordinance and through permit processes that regulate noise-producing activities. (Policy N.1.4)
- Enforce all local noise regulations pertaining to motor vehicle operations. (Policy N.2.1)
- Prioritize locations for implementing noise reduction, such as residential areas near major roads or areas near railroads. (Policy N.2.2)
- Require developers and business owners to minimize noise impacts associated with on-site motor vehicle activity through the use of noise-reduction features (e.g., berms, walls, well-designed site plans). (Policy N.2.3)
- Ensure that all new development within the identified noise contours of Torrance Municipal Airport will be compatible with existing and projected airport noise levels. (Policy N.2.4)
- Minimize airport operations-related noise violations by maintaining the City's Noise Abatement Program. (Policy N.2.5)
- Review industrial, commercial, or other noise-generating land use proposals for compatibility with nearby noise-sensitive land uses, and require that appropriate mitigation be provided. (Policy N.3.1)
- Require the inclusion of noise-reducing design features for developments near noise-sensitive land uses. (Policy N.3.2)
- Encourage dense, attractive landscape planting along roadways and adjacent to other noise sources to increase absorption of noise. (Policy N.3.3)
- Work with property and business owners to avoid or resolve noise incompatibilities in commercial or industrial areas. (Policy N.3.4)
- Encourage and support efforts by the State of California to abate noise pollution by using stricter quantitative noise standards, shorter compliance time governing operation of all types of motor vehicles, etc. (Policy N.4.1)
- Maintain open lines of communication between the City and all federal, state, and county agencies involved in noise abatement. (Policy N.4.2)
- Educate residents and businesses of the effects of noise pollution, ways they can assist in noise abatement, and noise abatement programs within the City. (Policy N.4.3)
- Support legislation at all levels of government that enhances local authority over noise sources. (Policy N.4.4)

Safety Element

Human Activity Hazards

- Ensure that land use decisions within the airport influence area are consistent with the standards contained within the Torrance Airport Comprehensive Land Use Plan (CLUP). (Policy S.5.1)

Circulation Element

Regional Circulation

- Facilitate commercial vehicle traffic through Torrance while minimizing adverse impacts by regulating truck parking regulations, minimizing intrusions into neighborhoods, and enforcing the use of truck routes. (Policy CI.1.3)

- Regulate the operation of commercial vehicles to minimize conflicts with surrounding land uses and to optimize vehicular and pedestrian mobility. (Policy CI.1.4)

Local Circulation

- Pursue trip reduction and transportation systems management measures to reduce and limit congestion at intersections and along streets throughout the City. (Policy CI-3.1)

- Encourage the use of regional rail, buses, bicycling, carpools, and vanpools for work trips to relieve regional traffic congestion. (Policy CI.3.4)

- Encourage site and building design that reduces automobile trips and parking space demand. (Policy CI.3.5)

- Protect residential neighborhoods from cut-through traffic by enhancing the capacity of Arterials and Collectors, improving signage, guiding traffic away from residential areas, and employing appropriate traffic-calming methods based on identified needs. (Policy CI-4.1)

- Increase average vehicle ridership through the implementation of transportation demand management programs. (Policy CI.4.3)

- Apply creative traffic management approaches to address congestion in areas with unique problems, particularly near schools, businesses with drive-through access, and locations where businesses interface with residential areas. (Policy CI.4.4)

- Coordinate with the Torrance Unified School District to explore the establishment of drop-off zones at schools where school children can be safely dropped off and picked up while reducing traffic congestion at peak hours. (Policy CI.4.5)

Alternatives to the Automobile

- Maintain and expand a public relations and information awareness program to promote transit use. (Policy CI-7.1)

- Support and encourage the use of public transit for local trips, trips to major employment and commercial centers, and connections to regional transportation transfer points. (Policy CI.7.3)

- Work with the Los Angeles County Metropolitan Transportation Authority to expand Metro Rapid bus service into Torrance. (Policy CI.7.7)

- Explore opportunities to maximize transit resources using smaller buses for less-traveled routes or shorter trips. (Policy CI.7.11)

- Provide and maintain safe, efficient, and convenient pedestrian pathways that offer access to major activity centers, recreation facilities, schools, community facilities, and transit stops. (Policy CI-8.1)
- Promote walking throughout the community by installing sidewalks where they are missing and making improvements to existing sidewalks when needed for safety purposes. Particular attention will be given to sidewalk improvements near schools and activity centers. (Policy CI.8.2)
- Provide and maintain a comprehensive system of bicycle lanes to meet the needs of cyclists traveling to all destinations within the City consistent with the Bicycle Master Plan. (Policy CI.8.4)
- Promote the provision of reasonable and secure bicycle storage and shower and locker facilities at major commercial developments and employment centers. (Policy CI.8.5)
- Seek county, State, federal, and private sector assistance to help finance development of bicycle facilities. (Policy CI.8.8)
- Promote the use of compact electric or similar powered vehicles for local trips. (Policy CI.8.9)

Land Use Element

Maintaining a Balanced Community

- Encourage the transition of incompatible, ineffective, and/or undesirable land uses to land uses that are compatible and consistent with the character of existing neighborhoods. (Policy LU.2.2)
- Consider both the impact of a proposed development on surrounding property and the impact of existing uses on new development. (Policy LU.2.3)
- Establish landscape or hardscape buffers between residential and non-residential uses, where appropriate, to minimize adverse effects. (Policy LU.2.5)

Mixed Use

- Permit mixed-use projects on a case-by-case basis to allow for the combination of residential units and commercial development on the same commercial site, where appropriate and compatible with long-established surrounding uses and in accordance with all applicable regulations. (Policy LU.7.1)

Industrial Districts

- Ensure that non-industrial uses do not negatively impact the viability of industrial areas. (Policy LU.8.1)
- Guide development in industrial districts through design and performance standards. Allow flexibility for industrial uses to respond to the changing demand of industry. (Policy LU.8.6)
- Strictly enforce City codes, including building and safety, zoning and land use regulations, and property maintenance codes, to maintain safe, high-quality industrial developments. (Policy LU.8.7)

Public and Quasi-Public Uses

- Consider the cumulative impact of private, non¬-emergency heliports and helistops in the City when reviewing applications for their approval, especially with regard to impact on residential areas. (Policy LU.10.3)

- Ensure that land use decisions within the airport influence area are consistent with the Safety Element and the Torrance Airport Comprehensive Land Use Plan (CLUP). (Policy LU.10.5)

5.11.5 Existing Regulations and Standard Conditions

State

- California Code of Regulations, Title 21, Part 1, Public Utilities Code (Regulation of Airports)
- California Code of Regulations, Title 24, Part 2, California Building Code.

City of Torrance Municipal Code

The City of Torrance Municipal Code contains regulations regarding noise nuisances:

- ***Division 4, Chapter 6, Noise Regulation, Section 46.2.6, Machinery, Equipment, Fans and Air Conditioning*** requires machinery, equipment, pump, fan, air conditioning apparatus or similar mechanical device to be operated in any manner that doesn't generate noise that would cause the noise level at the property line of any residential land to exceed the ambient noise level by more than 5 dBA.

- ***Division 4, Chapter 6, Noise Regulation, Section 46.3.1, Construction of Buildings and Projects*** prohibits construction activities unless they occur within the hours of 7:30 AM to 6:00 PM Monday through Friday and 9:00 AM to 5:00 PM on Saturday. Properties zoned as commercial, industrial or within an established redevelopment District, may conduct construction activities outside of these hours if a minimum buffer of 300 feet is maintained to the closest residential property unless construction noise exceeds 50 dBA. In addition, construction activities may occur outside of these hours if the City determines unusual circumstances exist).

- ***Division 4, Chapter 6, Noise Regulation, Section 46.7.2, Noise Limits*** provides restrictions on the amount and duration of noise generated at a property, as measured at the property line of the noise receptor.

- ***Division 4, Chapter 6, Noise Regulation, Section 46.8.8, Aircraft Noise Limit, and Section, 46.8.9, Aircraft Noise Limit at Night*** No aircraft taking off from or landing on the Torrance Municipal may exceed a single event noise exposure level of 88 dBA or a 82 dBA L_{max} as measured at ground level outside the extended Airport boundaries. In addition, aircrafts are prohibited from landing or taking off between the hours of 10:00 PM and 7:00 PM Monday through Friday and 10:00 PM and 8:00 AM on Saturday and Sunday.

5.11.6 Level of Significance Before Mitigation

Upon implementation of regulatory requirements and standard conditions of approval, the following impacts would be less than significant: 5.11-1 and 5.11-6.

Without mitigation, the following impacts would be **potentially significant**:

- Impact 5.11-2 Noise-sensitive uses could be exposed to elevated noise levels from transportation sources.
- Impact 5.11-3 Construction activities associated with buildout of the individual land uses associated with the proposed land use plan would expose sensitive uses to strong levels of groundborne vibration.
- Impact 5.11-4 Vibration-sensitive land uses could be exposed to strong levels of groundborne vibration.
- Impact 5.11-5 Construction activities associated with buildout of the individual land uses of the proposed land use plan would substantially elevate noise levels in the vicinity of noise-sensitive land uses.

5.11.7 Mitigation Measures

Impact 5.11-2

Noise Compatibility

11-1 Prior to the issuance of building permits for any project that involves a noise-sensitive use within the 60 dBA CNEL contour along major roadways, freeways, or railway, the project property owner/developers shall retain an acoustical engineer to conduct an acoustic analysis and identify, where appropriate, site design features (e.g., setbacks, berms, or sound walls) and/or required building acoustical improvements (e.g., sound transmission class rated windows, doors, and attic baffling), to ensure compliance with the City's Noise Compatibility Guidelines and the California State Building Code and California Noise Insulation Standards (Title 24 of the California Code of Regulations).

Impact 5.11-3

Construction-Related Vibration

11-2 Individual projects that involve vibration-intensive construction activities, such as pile drivers, jack hammers, and vibratory rollers, near sensitive receptors shall be evaluated for potential vibration impacts. If construction-related vibration is determined to be perceptible at vibration-sensitive uses (i.e., exceed the Federal Transit Administration vibration-annoyance criteria of 78 VdB during the daytime), additional requirements, such as use of less-vibration-intensive equipment or construction techniques, shall be implemented during construction (e.g., drilled piles to eliminate use of vibration-intensive pile driver).

Impact 5.11-4

Vibration Annoyance from Train Activity on the BNSF Railway

11-3 Prior to the issuance of building permits for any project that involves a vibration-sensitive use directly adjacent to the Burlington Northern Santa Fe railway, the development project application shall retain an acoustical engineer to evaluate potential for trains to create perceptible levels of vibration indoors. If vibration-related impacts are found, mitigation measures shall be implemented, such as use of concrete, iron, or steel, or masonry materials to ensure that levels of vibration amplification are within acceptable limits to building occupants, pursuant to the Federal Transit Administration vibration-annoyance criteria.

Impact 5.11-5

Construction-Related Noise

11-4 Construction activities associated with new development that occurs near sensitive receptors shall be evaluated for potential noise impacts. Mitigation measures—such as installation of temporary sound barriers for adjacent construction activities that occur adjacent to occupied noise-sensitive structures, equipping construction equipment with mufflers, and reducing nonessential idling of construction equipment to no more than five minutes—shall be incorporated into the construction operations to reduce construction-related noise to the extent feasible.

5.11.8 Level of Significance After Mitigation

Mitigation Measure 11-1 would reduce impacts associated with Impact 5.11-2 (roadway/train noise compatibility). While Title 24 requires structures to achieve interior noise levels of 45 dBA CNEL, exterior noise levels may continue to exceed the noise compatibility criteria for the City (see Table 5.11-3), despite exterior noise attenuation (i.e., walls and/or berms). Consequently, noise compatibility impacts would remain potentially significant.

Mitigation Measures 11-2 (construction-related vibration) and 11-4 (construction-related noise) would reduce impacts associated with construction activities to the extent feasible. However, due to the proximity of construction activities to sensitive uses and potential longevity of construction activities, noise and vibration Impact 5.11-3 (construction vibration) and Impact 5.11-5 (construction noise) would be significant.

Mitigation Measure 11-3 would ensure that any new vibration-sensitive structures near the BNSF would be constructed so that vibration would not be perceptible. Consequently, Impact 5.11-4 would be less than significant.

Despite the application of mitigation measures, Impacts 5.11-2, 5.11-3, and 5.11-5 were found to still result in **significant and unavoidable** noise impacts.

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