3.10 Noise

Environmental Setting

This section provides information on the noise environment in Carlsbad and evaluates the noise impacts associated with the proposed General Plan. The information contained in this section is based on the technical noise data prepared by Dudek and provided as Appendix D to this Program EIR).

PHYSICAL SETTING

Fundamentals of Noise

The following is a brief discussion of noise terminology and fundamental noise concepts.

Sound, Noise, and Acoustics

Sound is a mechanical wave or vibration that travels through the air or another medium, entailing a process that consists of three components: the source, the path, and the receiver. All three components must be present for sound to exist and be perceived. Without a source to produce sound, there is no sound. Likewise, without a medium to transmit sound pressure waves, there is no sound. Finally, sound must be received; a hearing organ, sensor, or object must be present to perceive, register, or be affected by sound or noise. In most situations, there are many different sound sources, paths, and receptors rather than just one of each. Acoustics is the field of science that deals with the production, propagation, reception, effects, and control of sound. Noise is defined as sound that is loud, unpleasant, unexpected, or undesired.

Sound Pressure Levels and Decibels

The amplitude of a sound determines its loudness. Loudness of sound increases with increasing amplitude. Sound pressure amplitude is measured in units of micro-Newton per square meter, also called micro-Pascal. One micro-Pascal is approximately one-hundred billionths (0.00000000001) of normal atmospheric pressure. The pressure of a very loud sound may be 200 million micro-Pascals, or 10 million times the pressure of the weakest audible sound. Because expressing sound levels in terms of micro-Pascal would be very cumbersome, sound pressure level in logarithmic units is used instead to describe the ratio of actual sound pressures to a reference pressure squared. These units are called Bels. To provide a finer resolution, a Bel is subdivided into 10 decibels, abbreviated dB.

A-Weighted Sound Level

Sound pressure level alone is not a reliable indicator of loudness. The frequency, or pitch, of a sound also has a substantial effect on how humans will respond. Although the intensity (energy per unit area) of the sound is a purely physical quantity, the loudness or human response is determined by the characteristics of the human ear.

Human hearing is limited not only in the range of audible frequencies but also in the way it perceives the sound in that range. In general, the healthy human ear is most sensitive to sounds between 1,000 Hertz (Hz) and 5,000 Hz, and it perceives a sound within that range as more intense than a sound of higher or lower frequency with the same magnitude. To approximate the frequency response of the human ear, a series of sound level adjustments is usually applied to the sound measured by a sound level meter. The adjustments (referred to as a weighting network) are frequency-dependent.

The A-scale weighting network approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make judgments of the relative loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. Other weighting networks have been devised to address high noise levels or other special situations (e.g., B-scale, C-scale, D-scale), but these scales are rarely used in conjunction with most environmental noise. Noise levels are typically reported in terms of A-weighted sound levels. All sound levels discussed in this report are A-weighted (dBA). Examples of typical noise levels for common indoor and outdoor activities are depicted in Table 3.10-1.

Table 3.10-1: Typical Sound Levels in the Environment and Industry

Common Outdoor Activities	*Noise Level (dB)*	*Common Indoor Activities*
	110	Rock Band
Jet Fly-over at 300 meters (1,000 feet)	100	
Gas Lawn Mower at 1 meter (3 feet)	90	
Diesel Truck at 15 meters (50 feet), at 80 kilometers/hour (50 miles/hour)	80	Food Blender at 1 meter (3 feet) Garbage Disposal at 1 meter (3 feet)
Noisy Urban Area, Daytime Gas Lawn Mower at 30 meters (100 feet)	70	Vacuum Cleaner at 3 meters (10 feet)
Commercial Area Heavy Traffic at 90 meters (300 feet)	60	Normal Speech at 1 meter (3 feet)
Quiet Urban Daytime	50	Large Business Office Dishwasher Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	30	Library
Quiet Rural Nighttime	20	Bedroom at Night, Concert Hall (Background)
	10	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

Source: *Caltrans 1998.*

Human Responses to Changes in Noise Levels

Under controlled conditions in an acoustics laboratory, the trained, healthy human ear is able to discern changes in sound levels of 1 dB when exposed to steady, single-frequency signals in the mid-frequency range. Outside such controlled conditions, the trained ear can detect changes of 2 dB in normal environmental noise. It is widely accepted that the average healthy ear, however, can barely perceive noise level changes of 3 dB. A change of 5 dB is readily perceptible, and a change of 10 dB is perceived as twice or half as loud. As discussed above, a doubling of sound energy results in a 3 dB increase in sound, which means that a doubling of sound energy (e.g., doubling the volume of traffic on a road) would result in a barely perceptible change in sound level.

Noise Descriptors

Additional units of measure have also been developed to evaluate the long-term characteristics of sound. The equivalent sound level (L_{eq}), is also referred to as the time-average sound level. It is the equivalent steady state sound level which in a stated period of time would contain the same acoustical energy as the time-varying sound level during the same time period. The 1-hour A-weighted equivalent sound level, L_{eq} (h), is the energy average of the A-weighted sound levels occurring during a 1-hour period and is the basis for the City of Carlsbad noise ordinance criteria.

People are generally more sensitive and annoyed by noise occurring during the evening and nighttime hours. Thus, another noise descriptor used in community noise assessments, the Community Noise Equivalent Level (CNEL), was introduced. The CNEL scale represents a time-weighted 24-hour average noise level based on the A-weighted sound level. The CNEL accounts for the increased noise sensitivity during the evening hours (7:00 p.m. to 10 p.m.) and nighttime hours (10:00 p.m. to 7:00 a.m.) by adding 5 dB and 10 dB, respectively, to the average sound levels occurring during the nighttime hours.

Sound Propagation

Sound propagation (i.e., the passage of sound from a noise source to a receiver) is influenced by several factors. These factors include geometric spreading, ground absorption, and atmospheric effects, as well as shielding by natural and/or man-made features.

Sound levels are attenuated at a rate of approximately 6 dB per doubling of distance from an outdoor point source due to the geometric spreading of the sound waves. Additional sound attenuation can result from man-made features such as intervening walls and buildings, as well as natural features such as hills and dense woods. Atmospheric conditions such as humidity, temperature, and wind gradients can temporarily either increase or decrease sound levels. In general, the greater the distance the receiver is from the source, the greater the potential for variation in sound levels due to atmospheric effects.

Groundborne Vibration

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several methods are typically used to quantify the amplitude of vibration including peak particle velocity (PPV) and root mean square (RMS) velocity. PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. RMS velocity is defined as the average of the squared amplitude of the signal. PPV and RMS vibration velocity amplitudes are used to evaluate human response to vibration.

Railroad operations are potential sources of substantial ground vibration depending on distance, the type and the speed of trains, and the type of railroad track. People's response to ground vibration has been correlated best with the velocity of the ground.

One of the problems with developing suitable criteria for groundborne vibration is the limited research into human response to vibration and more importantly human annoyance inside buildings. The U.S. Department of Transportation, Federal Transit Administration has developed rational vibration limits that can be used to evaluate human annoyance to groundborne vibration. These criteria are primarily based on experience with passenger train operations, such as rapid transit and commuter rail systems. The main difference between passenger and freight operations is the time duration of individual events; a passenger train lasts a few seconds whereas a long freight train may last several minutes, depending on speed and length.

REGULATORY SETTING

Federal Regulations

Department of Housing and Urban Development

The U.S. Department of Housing and Urban Development's environmental criteria and standards are presented in 24 Code of Federal Regulations (CFR) Part 51. New construction proposed in high noise areas (exceeding 65 dBA day-night average sound level (L_{dn}) must incorporate noise attenuation features to maintain acceptable interior noise levels. A goal of 45 dBA L_{dn} is set forth for interior noise levels and attenuation requirements are geared toward achieving that goal. It is assumed that with standard construction, any building will provide sufficient attenuation to achieve an interior level of 45 dBA L_{dn} or less if the exterior level is 65 dBA L_{dn} or less. Approvals in a "normally unacceptable noise zone" (exceeding 65 decibels, but not exceeding 75 dB) require a minimum of 5 dB of additional noise attenuation for buildings having noise sensitive uses if the L_{dn} is greater than 65 decibels, but does not exceed 70 dB, or a minimum of 10 dB of additional noise attenuation if the day-night average is greater than 70 dB, but does not exceed 75 dB.

Federal Highway Administration

An assessment of noise and consideration of noise abatement per Title 23 of the CFR, Part 772, "Procedures for Abatement of Highway Traffic Noise and Construction Noise," is required for proposed federal or federal-aid highway construction projects on a new location, or the physical alteration of an existing highway that significantly changes either the horizontal or vertical alignment, or increases the number of through-traffic lanes. The Federal Highway Administration (FHWA) considers noise abatement for sensitive receivers, such as picnic areas, recreation areas, playgrounds, active sport areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals when "worst-hour" noise levels approach or exceed 67 dBA L_{eq}. The California Department of Transportation (Caltrans) has further defined the definition of "approach" as meaning to be within 1 dB of the Noise Abatement Criteria (NAC).

Federal Transit Administration

This analysis uses the Federal Transit Administration's vibration impact criteria for sensitive buildings, residences, and institutional land uses near railroads. The thresholds for residences and buildings where people normally sleep are 72 vibration decibels (VdB) for frequent events (more than 70 events of the same source per day), 75 VdB for occasional events (30 to 70 vibration events of the same source per day), and 80 VdB for infrequent events (less than 30 vibration events of the same source per day).

Federal Aviation Administration Standards

Enforced by the Federal Aviation Administration (FAA), Title 14 of the CFR, Part 150 describes the procedures, standards and methodology governing the development, submission, and review of airport noise exposure maps and airport noise compatibility programs. Title 14 also identifies the land uses that are normally compatible with various levels of exposure to noise by individuals.

The FAA has determined that sound levels up to 45 dBA CNEL are acceptable within residential buildings.

Federal Railroad Noise Emissions Compliance Regulation

The Federal Railroad Administration's Office of Safety is responsible for enforcing the Railroad Noise Emissions Compliance Regulation that sets maximum sound levels from railroad equipment and for regulating locomotive horns.

State Regulations

California Noise Control Act of 1973

The California Noise Control Act of 1973 can be found in Sections 46000 through 46080 of the California Health and Safety Code. The act finds that excessive noise can result in physiological, psychological, and economic damage. This act states that it is the policy of the State of California to provide an environment for all Californians free from noise that jeopardizes their health or welfare and they are entitled to a peaceful and quite environment without the intrusion of noise that may be hazardous to their health or welfare.

California Health and Safety Code Section 118825–118830

This law addresses noise pollution regarding supersonic transport aircraft prohibiting the service of private or commercial aircraft landings or take offs within the state that do not comply with federal certification limits for subsonic jet transport aircraft.

California Code of Regulations Title 24

The Noise Installation Standards require an acoustical analysis for multifamily dwellings located in an area exceeding 60 dBA CNEL. The analysis must show that the proposed design would limit interior noise in habitable rooms to 45 dBA CNEL or below. This analysis must be conducted prior to obtaining a building permit.

The interior noise analysis should identify sound transmission loss requirements for building elements exposed to exterior noise levels exceeding 60 dBA CNEL. If the interior 45 dBA CNEL limit can be achieved only with the windows closed, the residence design must include mechanical ventilation that meets applicable Uniform Building Code requirements.

California Code of Regulations Title 21- Airport Noise Standards

Noise standards governing the operation of aircraft and aircraft engines for all airports are described in California Code of Regulations (CCR) Title 21, Division of Aeronautics, Subchapter 6 "Noise Standards." The regulations are designed to cause the airport proprietor, aircraft operator, local governments, pilots, and the Department of Aeronautics to work cooperatively to diminish noise. The regulations are achieved by controlling and reducing noise that affects communities in the vicinity of airports.

Local Regulations

City of Carlsbad Noise Guidelines Manual

The City of Carlsbad Noise Guidelines Manual is primarily intended to address community noise issues related to land use. Carlsbad's Noise Element policies are summarized, the science of noise is summarized, procedures for the processing of a project are explained, preferred methods for the mitigation of noise are listed, and a preferred noise report format is presented. Additionally, typical conditions of approval are listed. The Noise Guidelines Manual does not address noise issues such as animal noise, noise from parties and loud gatherings, motor vehicle noise or general nuisance noise, for which the best resource is the Carlsbad Municipal Code Noise Ordinance (CMC Chapter 8.48).

City of Carlsbad Municipal Code

Carlsbad Municipal Code (CMC) Chapter 8.48 outlines regulations for limitation of hours for construction (i.e., the erection, demolition, alteration, or repair of any building or structure or the grading or excavation of land) that creates disturbing, excessive, or offensive noise. Construction can occur Monday through Friday from 7 a.m. to 6 p.m. and Saturday 8 a.m. to 6 p.m.; no work shall be conducted on Sundays and any federal holiday. CMC Chapter 8.48 also outlines exceptions that may be granted by the city for circumstances such as emergency repairs required to protect the health and safety of the community.

CMC Section 8.09.110 outlines guidelines for conducting sound and noise measurements of entertainment establishments. Measurements shall be recorded using the A-weighted decibel scale. CMC Section 08.09.090 states that "Between the hours of ten p.m. and seven a.m. no entertainment establishment may cause, permit or maintain noise at a sound level to the extent that the on-hour average sound level exceeds 65.0 dBA Leq-1m at the property line of the entertainment establishment of which the noise was produced. The noise subject to these limits is that part of the total noise at the specified location that is due solely to the action of said responsible party."

CMC Section 21.34.090 specifies that the maximum allowable exterior noise level of any industrial use shall not exceed 65 dBA L_{dn} as measured at the property line. If the industrial use occupies a building with more than one use, the noise level shall not be in excess of 45 dBA L_{dn} as measured within the interior space of the neighboring establishment. The noise levels in the loading areas and docks of shopping centers should not exceed 65 dBA CNEL at the shopping center's property line according to CMC Section 21.31.080, Development Standards. No signs in the city shall make noise as outlined in CMC Section 21.41.030.

Other noise restrictions can be found in the CMC including conditions regarding noise when issuing minor conditional use permits and conditional use permits (CMC Chapter 21.42). Coin-operated arcades, bowling alleys, pool halls, or billiard parlors should contain all noise created by such an operation with no noise audible from outside the structure. Car washes may require a noise analysis addressing impacts on surrounding developments. Greenhouses greater than 2,000 square feet that use fans shall not create a noise nuisance to nearby residences. Noise permits are not issued in the city.

General Plan Noise Standards

The proposed General Plan includes several standards for noise.

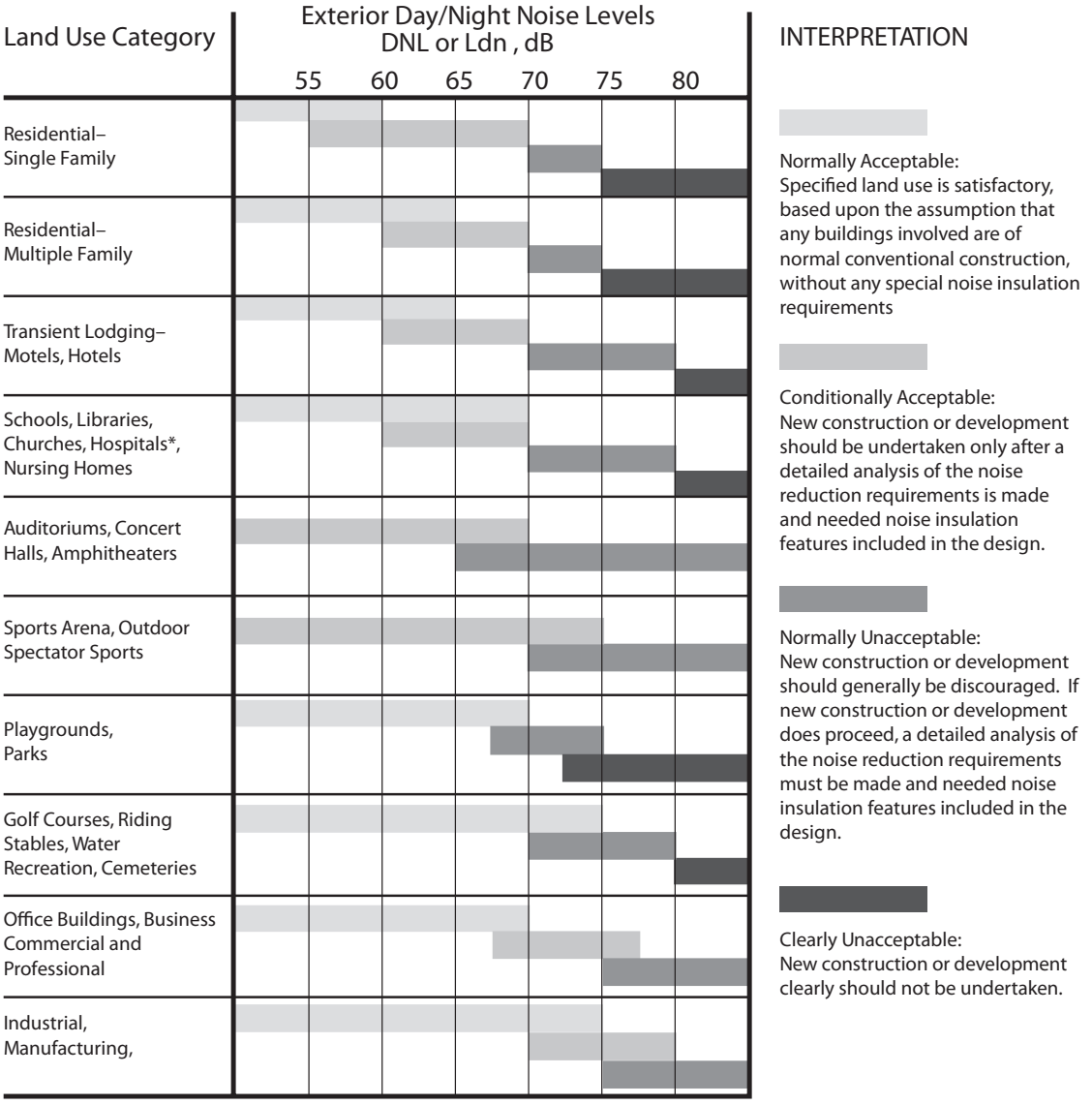
Community Noise Exposure

Table 3.10-2 presents the community noise exposure matrix, establishing criteria the city shall use to evaluate land use compatibility based on noise emanating from all sources.

Allowable Noise Exposure

Table 3.10-3 indicates acceptable limits of noise for various land uses for both exterior and interior environments from transportation sources. While Table 3.10-2 establishes standards to help the city establish the appropriateness of locating specific uses in noise-prone environments, Table 3.10-3 provides standards that development shall attain through noise attenuation measures. These limits are based on guidelines provided by the California Office of Planning and Research.

Table 3.10-2: Land Use Compatibility for Community Noise Environments



Source: Office of Planning and Research, State of California General Plan Guidelines,
Appendix A: Guidelines for the Preparation and Content of the Noise Element of the General Plan, 1998.

*Because hospitals are often designed and constructed with high noise insulation properties, it is possible for them to be satisfactorily located in noisier areas.

Table 3.10-4 provides standards for noise from non-transportation noise sources such as industrial facilities, automotive servicing, or equipment yards. These standards apply to the noise sources themselves, as measured at the edge of the property line; noise caused by motor vehicles traveling to and from the site is exempt from this standard.

Table 3.10-3: Allowable Noise Exposure

Land Use	*Outdoor Activity[2,3] Areas (DBA CNEL)*	*Interior Spaces (DBA CNEL)*
Residential	60[4]	45
Motels, Hotels	65	45
Hospitals, Residential Care Facilities, Schools, Libraries, Museums, Churches, Day Care Facilities	65	45
Playgrounds, Parks, Recreation Uses	65	50
Commercial and Office Uses	65	50
Industrial Uses	70	65

1 Development proposed within the McClellan-Palomar Airport Area of Influence shall also be subject to the noise compatibility policies contained in the ALUCP.

2 For non-residential uses, where an outdoor activity area is not proposed, the standard does not apply. Where the location of outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving use.

3 Where it is not possible to reduce noise in outdoor activity areas to the allowable maximum, levels up to 5 dB higher may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.

4 An exterior noise exposure level of 65 dBA CNEL is allowable for residential uses in a mixed-use project and for residential uses within the McClellan-Palomar Airport Area of Influence, pursuant to the noise compatibility policies contained in the ALUCP.

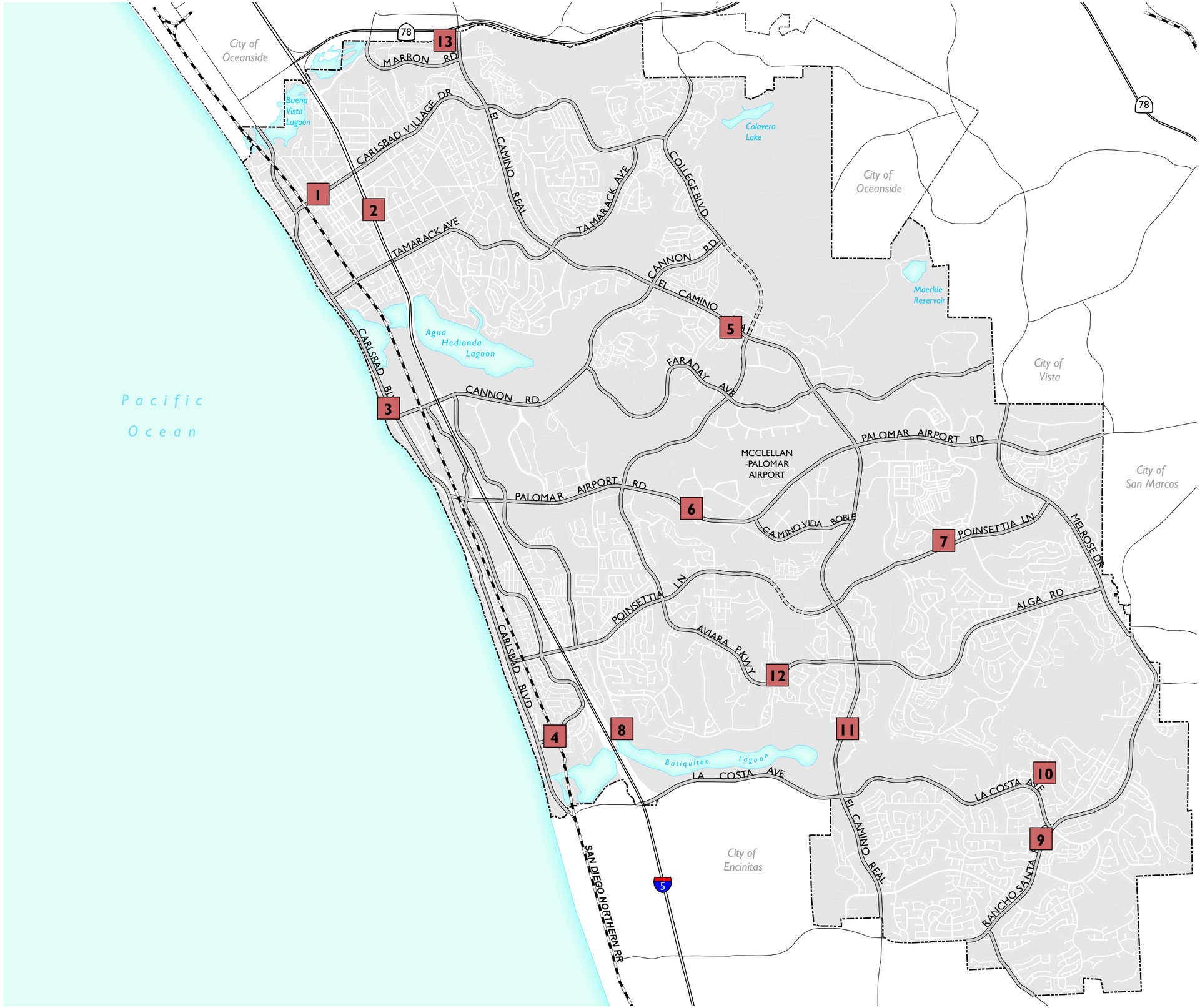
Table 3.10-4: Performance Standards for Non-Transportation Sources (As Measured at Property Line of Source/Sensitive Use

Noise Level Descriptor	*Daytime (7 A.M. to 10 P.M.)*	*Nighttime (10 P.M. to 7 A.M.)*
Hourly Leq, dB	55	45
Maximum Level, dB	75	65

Each of the noise levels specified above shall be lowered by 5 dB for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises.

Figure 3.10-1

PROPOSED GENERAL PLAN
Noise Measurement Locations



Source: DUDEK, 2013; City of Carlsbad, 2013; SANDAG, 2013; Dyett & Bhatia, 2013.

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Existing Noise

Carlsbad has a wide mix of land uses, and is subject to numerous noise sources, primarily vehicular traffic on major roadways and rail traffic. The city is also subject to typical urban noise sources such as construction, police and fire department sirens, landscaping equipment, barking dogs, high altitude jet aircraft, and car alarms.

A community noise survey was conducted between Aug. 7 and Aug. 8, 2013. The survey documents typical daytime noise levels from a variety of noise sources and land uses throughout the city. The dominant noise source identified during the ambient noise survey was traffic from the major transportation corridors (Interstate 5 (I-5) and State Route 78 (SR-78)) and the local area roadway network. The noise measurement locations are shown in Figure 3.10-1, and Table 3.10-5 summarizes the measurement dates/times, and results. The noise measurements were conducted in accordance with American National Standards Institute (ANSI) standards at 13 locations using a Piccolo precision integrating sound-level meter. The sound-level meter's calibration was verified before and after use with an acoustical calibrator to ensure that the measurements would be accurate. The equipment used meets all pertinent specifications of the ANSI for Type 2 sound-level meters (ANSI S1.4-1983).

As shown in Table 3.10-5, noise levels varied from 45 dBA L_{eq} at location M4 (located in a residential community immediately south of Avenida Encinas and east of the rail line), to 69 dBA L_{eq} at location M2 (Holiday Park, approximately 175 feet from the I-5 centerline).

Table 3.10-5: Summary of Noise Measurement Survey Results (dBA)

Site	*Location*	*Date hh:mm*	*Measurement Duration (minutes)*	*Leq*	*Lmax*	*Lmin*	*L10*	*L50*	*L90*
M1	Carlsbad Village Drive at Roosevelt Street	8/8/2013 15:05	10	58.8	73.6	48.3	61	55	49
M2	Holiday Park, Pio Pico Drive at Chestnut Avenue	8/8/2013 14:41	10	69.1	76.4	65.2	69	69	67
M3	Tierra del Oro, west of Carlsbad Blvd.	8/8/2013 14:13	10	54.4	62.4	47.8	57	51	49
M4	Halsing Court, south of Avenida Encinas, east of rail line	8/7/2013 10:20	10	45.4	55.3	40	47	43	39

Table 3.10-5: Summary of Noise Measurement Survey Results (dBA)

Site	*Location*	*Date hh:mm*	*Measurement Duration (minutes)*	*Leq*	*Lmax*	*Lmin*	*L10*	*L50*	*L90*
M5	El Camino Real south of Camino Hills Drive	8/7/2013 15:33	10	62.8	71.6	41.6	65	61	53
M6	Palomar Airport Road at Palomar Oaks Way	8/8/2013 16:03	10	58.2	72.9	46.1	59	55	49
M7	Mica Road north of Poinsettia Lane	8/7/2013 14:57	10	47.1	59.8	41.6	49	45	41
M8	Gabbiano Lane, north of Batiquitos Lagoon	8/7/2013 10:52	10	61.6	66.4	57.6	63	61	59
M9	Rancho Santa Fe Road south of La Costa Avenue	8/7/2013 13:38	10	53.6	66.6	41	55	47	43
M10	Cadencia Street, north of Del Rey Avenue	8/7/2013 14:08	10	55.6	69.5	42.4	59	45	43
M11	El Camino Real south of Arenal Road	8/7/2013 13:05	10	56.9	64.5	46.6	59	55	49
M12	Aviara Parkway northeast of Batiquitos Drive	8/7/2013 11:56	10	49.1	63.2	41	51	47	41
M13	El Camino Real south of SR-78	8/8/2013 15:32	10	55.2	62.8	51.4	57	53	53

Leq = equivalent sound level.

Lmax = maximum sound level.

Lmin = minimum sound level.

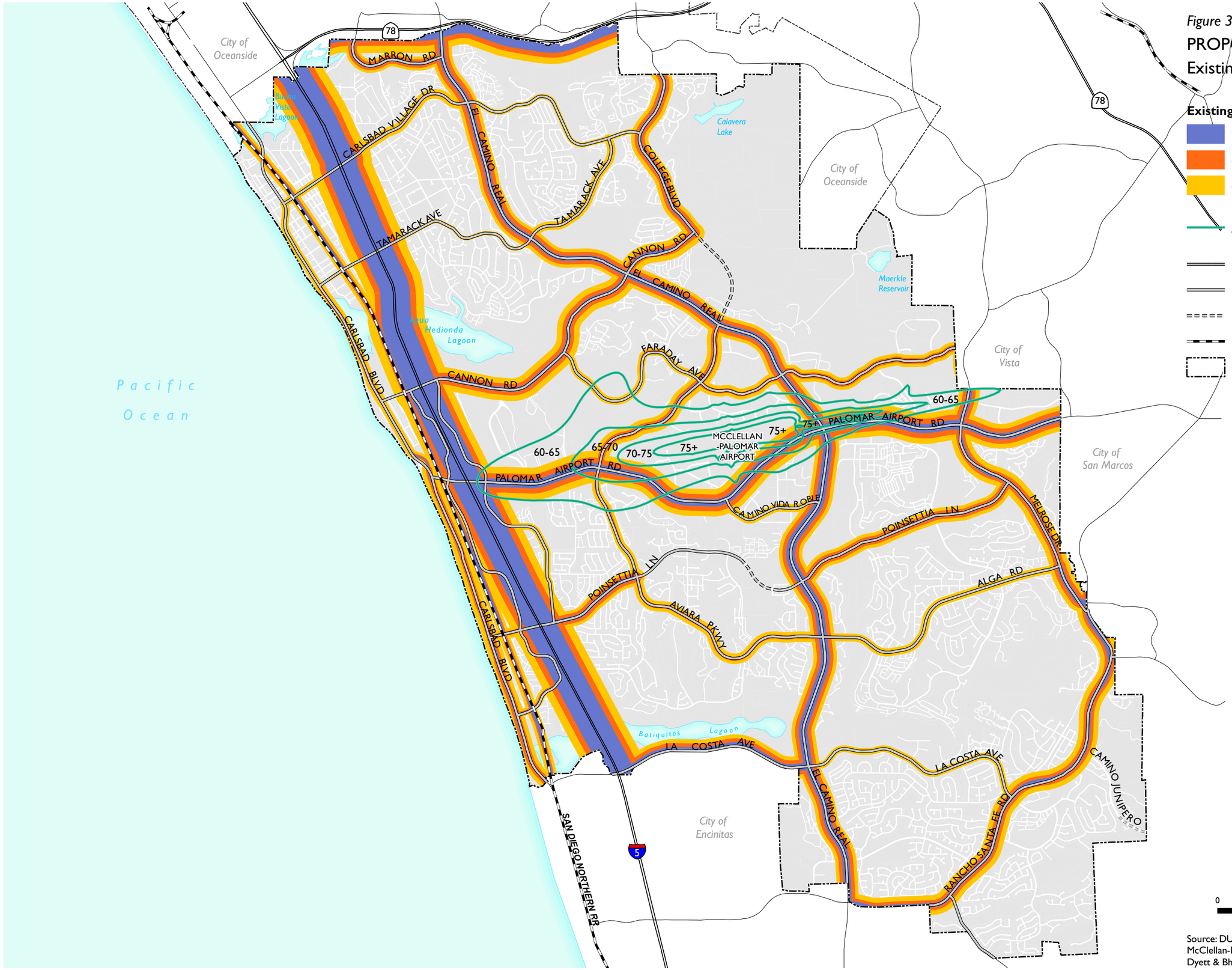
L10 = noise level exceed for 10% of the measurement period.

L50 = noise level exceed for 50% of the measurement period.

L90 = noise level exceed for 90% of the measurement period.

Figure 3.10-2

PROPOSED GENERAL PLAN
Existing Noise Contours



Source: DUDEK, 2013; City of Carlsbad, 2013; SANDAG, 2013; McClellan-Palomar Airport Land Use Compatibility Plan, 2010; Dyett & Bhatia, 2013.

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Sensitive Receptors

The city's Noise Guidelines define noise-sensitive land uses as those typically utilized for living or dwelling units. The following land uses are considered to be noise-sensitive in the city: single-family residential use or multifamily residential uses that may include a single house, duplex, condominium, townhome, apartment, and stock cooperative projects. Other noise-sensitive land uses may include, but are not limited to: hotels, motels, hospitals, board and care facilities, convalescent facilities, nursing or rest homes, boarding schools, convents, churches, and emergency services living quarters.

Major Mobile Noise Sources

Highways and Major Streets

Traffic is the largest source of noise within the city. I-5 and SR-78 are the greatest sources of traffic noise. Major streets, including Aviara Parkway, Alga Road, Cannon Road, Carlsbad Boulevard, Carlsbad Village Drive, El Camino Real, La Costa Avenue, Melrose Drive, Palomar Airport Road, Poinsettia Lane, Rancho Santa Fe Road, and Tamarack Avenue, are also significant noise sources to land uses immediately joining these roadways.

Table 3.10-6 summarizes the modeled existing traffic noise levels 100 feet from the centerline of each major street in the city (200 feet from the centerlines of the I-5 and SR-78 freeways). These distances are considered to be representative of the distance typical for noise-sensitive uses in the city. Traffic noise modeling is based on existing average daily traffic (ADT) volumes, and distances from the street centerlines to the 60 dBA, 65 dBA, and 70 dBA CNEL traffic noise contours. Figure 3.10-2 shows the corresponding contours graphically. As shown in Table 3.10-6, the location of the 65 dBA CNEL contour ranges from 40 feet (along Carlsbad Village Drive between El Camino Real and College Boulevard and Tamarack Avenue between Carlsbad Boulevard and El Camino Real) to 1,010 feet (I-5 between Carlsbad Village Drive and Tamarack Avenue) from the centerline of the modeled streets. The extent to which existing land uses in the city are affected by existing traffic noise depends on their respective proximity to the streets and their individual sensitivity to noise. Refer to Appendix D for complete modeling inputs and results.

Table 3.10-6: Summary of Modeled Existing Traffic Noise Levels

Street	*Segment*	*Existing CNEL 100 Feet from Street Centerline / 200 Feet from Freeway Centerline (dBA)*	*Distance to CNEL Noise Contour (feet)*		
			Existing		
			CNEL 70	*CNEL 65*	*CNEL 60*
Cannon Road	I-5 to El Camino Real	70	100	275	540
Cannon Road	El Camino Real to College Boulevard	69	80	210	460
College Boulevard	Palomar Airport Road to El Camino Real	68	60	160	350
College Boulevard	Northern City Limits to Cannon Road	70	100	240	410
Palomar Airport Road	I-5 to College Boulevard	74	210	460	770
Palomar Airport Road	College Boulevard to El Camino Real	73	170	400	650
Palomar Airport Road	El Camino Real to Melrose Drive	75	220	470	730
Palomar Airport Road	Melrose Drive to Western City Limits	72	150	360	590
El Camino Real	Northern City Limits to Tamarack Avenue	72	140	330	480
El Camino Real	Tamarack Avenue to Canon Road	71	120	290	450
El Camino Real	Cannon Road to College Boulevard	72	160	340	500
El Camino Real	College Boulevard to Palomar Airport Road	72	150	330	490
El Camino Real	Palomar Airport Road to La Costa Avenue	74	210	390	560
El Camino Real	La Costa Avenue to Rancho Santa Fe Road	73	170	350	510
Carlsbad Boulevard	North of Carlsbad Village Drive	62	20	50	140
Carlsbad Boulevard	Carlsbad Village Drive to Tamarack Avenue	63	30	70	180
Carlsbad Boulevard	Tamarack Avenue to Cannon Road	65	30	100	240
Carlsbad Boulevard	Cannon Road to Palomar Airport Road	64	30	80	200
Carlsbad Boulevard	Palomar Airport Road to Poinsettia Avenue	67	60	150	340
Carlsbad Boulevard	Poinsettia Avenue to La Costa	68	70	180	360

Table 3.10-6: Summary of Modeled Existing Traffic Noise Levels

Street	*Segment*	*Existing CNEL 100 Feet from Street Centerline / 200 Feet from Freeway Centerline (dBA)*	*Distance to CNEL Noise Contour (feet)*		
			Existing		
			CNEL 70	*CNEL 65*	*CNEL 60*
	Avenue				
Rancho Santa Fe Road	Palomar Airport Road to El Camino Real	70	100	240	470
La Costa Avenue	I-5 to El Camino Real	73	170	320	480
La Costa Avenue	El Camino Real to Rancho Santa Fe Road	63	30	60	160
Marron Road	West of El Camino Real	69	90	200	330
Carlsbad Village Drive	Carlsbad Blvd to I-5	63	30	70	180
Carlsbad Village Drive	I-5 to El Camino Real	65	40	90	230
Carlsbad Village Drive	El Camino Real to College Blvd	61	30	40	120
Tamarack Avenue	Carlsbad Blvd to I-5	60	20	40	100
Tamarack Avenue	I-5 to El Camino Real	60	20	40	100
Tamarack Avenue	El Camino Real to Carlsbad Village Drive	64	30	80	200
Faraday Avenue	Cannon Road to College Blvd	63	30	70	180
Faraday Avenue	College Blvd to El Camino Real	66	40	110	260
Faraday Avenue	El Camino Real to Melrose Drive	67	50	140	290
Aviara Pkwy/Alga Road	Palomar Airport Road to Poinsettia Avenue	64	30	80	200
Aviara Pkwy/Alga Road	Poinesttia Avenue to El Camino Real	65	40	100	250
Aviara Parkway/Alga Road	El Camino Real to Melrose Drive	64	30	70	190
Camino Vida Roble	Palomar Airport Road to El Camino Real	63	30	70	190
Poinsettia Lane	Carlsbad Blvd to I-5	65	40	100	250
Poinsettia Lane	I-5 to Aviara Parkway	70	100	240	390
Poinsettia Lane	El Camino Real to Melrose Drive	69	80	200	360
Avenida Encinas	Cannon Road to Palomar Airport Road	62	30	60	160

Table 3.10-6: Summary of Modeled Existing Traffic Noise Levels

Street	Segment	Existing CNEL 100 Feet from Street Centerline / 200 Feet from Freeway Centerline (dBA)	Distance to CNEL Noise Contour (feet)		
			Existing		
			CNEL 70	CNEL 65	CNEL 60
Avenida Encinas	Palomar Airport Road to Poinsettia Avenue	61	20	50	120
Avenida Encinas	Poinesttia Avenue to Carlsbad Blvd	63	30	70	180
Paseo del Norte	Cannon Road to Palomar Airport Road	61	20	50	130
Paseo del Norte	Palomar Airport Road to Poinsettia Avenue	62	30	60	160
Melrose Drive	Sycamore Avenue to Palomar Airport Road	71	130	300	500
Melrose Drive	Palomar Airport Road to Poinsettia Avenue	70	90	220	450
Melrose Drive	Poinsettia Avenue to Alga Road	70	90	230	460
Melrose Drive	Alga Road to Rancho Santa Fe Road	73	160	380	570
I-5 Freeway	Las Flores Drive to Carlsbad Village Drive	79	710	980	1,360
I-5 Freeway	Carlsbad Village Drive to Tamarack Avenue	79	730	1,010	1,420
I-5 Freeway	Tamarack Avenue to Cannon Road	79	710	980	1,360
I-5 Freeway	Cannon Road to Palomar Airport Road	79	690	930	1,250
I-5 Freeway	Palomar Airport Road to Poinsettia Lane	79	700	980	1,320
I-5 Freeway	Poinsettia Lane to La Costa Avenue	79	710	980	1,330
SR-78 Freeway	I-5 to Jefferson Street	77	570	800	1,100
SR-78 Freeway	Jefferson Street to El Camino Real	77	570	810	1,150
SR-78 Freeway	El Camino Real to College Boulevard	77	570	800	1,100

Source: Dudek 2013.

Atchison, Topeka and Santa Fe Railway

The Atchison, Topeka and Santa Fe (AT&SF) Railway has two passenger rail stations located within the city, Carlsbad Village and Carlsbad Poinsettia, which are utilized by the North County

Transit District COASTER commuter rail line. The 6.5-mile segment through the city is also used by the AT&SF freight line and the Amtrak commuter line. Based upon available data from the operator websites and the North Coast Transit District, and using the FTA's rail noise spreadsheet model, the noise level (CNEL) at 100 feet from the rail centerline was determined to be 66 dBA. The distance from the rail centerline to the 70, 65 and 60 dBA CNEL contours is shown in Table 3.10-7.

Table 3.10-7: Summary of Results - Rail Noise

Noise Contour	*Distance in feet from rail centerline*
70 dBA CNEL contour	60
65 dBA CNEL contour	120
60 dBA CNEL contour	250

Aircraft

McClellan–Palomar Airport is located within the city, west of El Camino Real, just north of Palomar Airport Road. Aircraft noise from the McClellan–Palomar Airport is a major contributor of noise in the city. To minimize the public's exposure to excessive noise and prevent incompatible land uses with regards to exposure to aircraft noise a McClellan-Palomar Airport Land Use Compatibility Plan (ALUCP) was adopted January 25, 2010 (last amended December 1, 2011). The ALUCP includes development policies regarding the compatibility of development areas and exposure to noise (e.g., residential infill development shall not be allowed where exposure to noise levels of more than 65 dBA CNEL may occur). An Airport Influence Area is established in two parts—Review Area 1 and Review Area 2—in which the noise impact area is 60 dBA CNEL and 65 dBA CNEL respectively.

Impact Analysis

SIGNIFICANCE CRITERIA

For the purposes of this Program EIR, a significant impact would occur if the proposed plan would:

- Expose persons to or generate noise levels in excess of the noise standards established in the proposed General Plan Noise Element;
- Expose persons to or generate excessive groundborne vibration or groundborne noise levels;
- Increase noise levels by 3 dBA in areas that already exceed city standards and that would impact sensitive land uses;
- Result in a substantial permanent, temporary or periodic increase in ambient noise levels above levels existing without the proposed General Plan; or

- Result in a project that exposes people residing or working in the project area to excessive noise levels due to the project's location within an airport land use plan area or within two miles of a public airport or public use airport.

METHODOLOGY AND ASSUMPTIONS

Existing and future (year 2035) traffic noise levels from the Carlsbad's major streets were modeled using the FHWA Highway Traffic Noise Model (TNM) version 2.5 and traffic data provided by the proposed General Plan traffic consultant (Fehr & Peers). Existing traffic noise modeling is intended to establish a baseline for existing noise conditions and for comparison with future conditions. The TNM model inputs include vehicle volumes, vehicle mix (percentage of autos, medium trucks and heavy trucks), speed, street configuration, distance to the receiver, and ground attenuation factors. Truck usage and vehicle speeds on the modeled streets were estimated from field observations. Caltrans data were also used to verify vehicle mix.[1] For the purposes of this analysis, it was assumed that all areas are flat, that the roadways and receivers are at the same elevation, and that there is no intervening terrain, structures, or walls between the streets and the receivers. Thus, the modeled data represents a conservative, worst-case estimate of traffic noise in Carlsbad.

Rail noise was also estimated, using the Federal Transit Administration (FTA) rail noise spreadsheet model. Input to the rail noise model included the numbers of daily passenger and freight operations during daytime (7 a.m. to 10 p.m.) and nighttime (10 p.m. to 7 a.m.) hours, the train speeds, and the typical train consists (numbers of engines and cars).

SUMMARY OF IMPACTS

Future development under the proposed General Plan could result in noise impacts related to construction, future traffic volumes, the McClellan-Palomar Airport, and other land use compatibility factors. However, local regulations, as well as proposed goals and policies in the proposed General Plan would reduce potential impacts of the proposed General Plan to less than significant.

[1] Caltrans. 2013. *2011 Annual Average Daily Truck Traffic on the California State Highway System*. Prepared in cooperation with the U.S. Department of Transportation, Federal Highway Administration. Accessed September 13, 2013. http://traffic-counts.dot.ca.gov/truck2011final.pdf.

IMPACTS

Impact 3.10-1 Development under the proposed General Plan would not expose persons to or generate noise levels in excess of the standards established in the proposed General Plan Noise Element. (*Less than Significant)*

Temporary (Construction Noise)

Noise from construction activities is mainly generated by two sources: active, on-site construction equipment, and the transport of machinery, equipment, materials, and workers to and from the construction sites. The noise from these sources can result in annoyance, temporary loss of concentration, sleep disruption, or other negative effects at nearby residences and businesses or other noise-sensitive receptors (e.g., hospitals, senior centers, schools, day care facilities, etc.).

While implementation of the proposed General Plan would not directly result in new development within the city, it would allow additional development that would generate noise during construction activities. Although a large portion of the city is developed, portions remain vacant or are planned for redevelopment. It is unlikely the city would experience intensive construction activity with implementation of the proposed General Plan. Although the city has construction noise level standards, construction noise levels have not been modeled at this program level of analysis, because the extent and timing of future construction activities within the city are unknown at this time.

Compliance with the City of Carlsbad Noise Ordinance (CMC Chapter 8.48) and the proposed General Plan Noise Element goals and policies would reduce noise levels from construction activities. Specifically, the city's Noise Ordinance limits the days and hours of construction in areas with the potential to cause disturbance. The city would require each future project to comply with the Noise Ordinance and Noise Guidelines Manual, and implement the proposed General Plan policies to reduce construction noise levels. Through the environmental review process for individual projects, additional mitigation may also be required to further reduce construction-related noise impacts to a less–than-significant level.

Compliance with the city's Noise Ordinance and the proposed General Plan goals and policies would reduce short-term construction noise impacts to less-than-significant levels.

Permanent (Traffic Noise)

Long-term project-generated traffic noise levels could exceed the city's standards for transportation-related noise at existing and proposed noise-sensitive receptors. Implementation of the proposed General Plan would allow new development within the city that would generate additional traffic. The additional traffic would result in increases in existing noise levels along major streets, including Aviara Parkway, Alga Road, Cannon Road, Carlsbad Boulevard, Carlsbad Village Drive, El Camino Real, La Costa Avenue, Melrose Drive, Palomar Airport Road, Poinsettia Lane, Rancho Santa Fe Road, and Tamarack Avenue, as well as the two freeways within the city (I-5 and SR-78) and may result in noise levels along streets greater than 65 dBA CNEL.

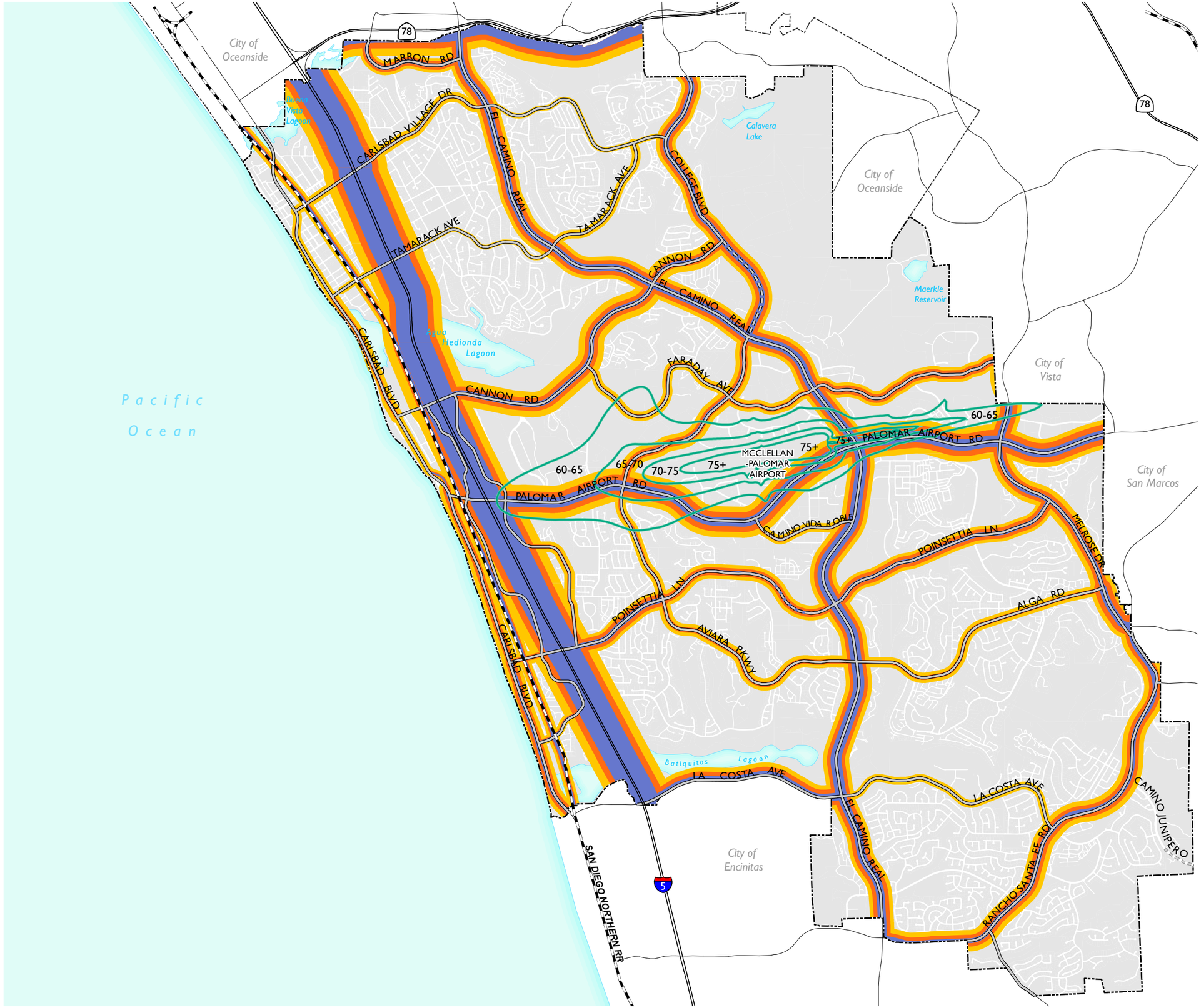
As described in the Methodology and Assumptions section above, future traffic noise levels associated with the proposed General Plan (year 2035) were calculated for street segments in the city using the FHWA's TNM. Table 3.10-8 summarizes the modeled year 2035 traffic noise levels 100 feet from the centerline of each major street in the city (200 feet from the centerlines of the I-5 and SR-78 freeways). These distances are considered to be representative of the distance typical for noise sensitive uses in the city. Traffic noise modeling is based on existing average daily traffic (ADT) volumes, and distances from the street centerlines to the 60 dBA, 65 dBA, and 70 dBA CNEL traffic noise contours. Figure 3.10-3 shows the corresponding contours graphically. As shown in Table 3.10-8, the location of the 65 dBA CNEL contour ranges from 40 feet (along Tamarack Avenue between I-5 and El Camino Real) to 1,030 feet (I-5 between Carlsbad Village Drive and Tamarack Avenue) from the centerline of the modeled streets. The traffic noise levels presented represent conservative traffic noise modeling methodologies because they assume no shielding from existing or proposed structures or topography and efficient propagation conditions. Actual traffic noise exposure levels at noise sensitive receptors in the project vicinity would vary depending on a combination of factors such as variations in daily traffic volumes, shielding provided by existing and proposed structures, intervening ground properties and meteorological conditions. Refer to Appendix X for complete modeling inputs and results.

Table 3.10-8 indicates that changes in traffic noise levels within Carlsbad would generally experience increases of 0 dB to 2 dB along most of the city's roadways, when rounded to whole numbers. A small decrease in traffic noise (-1 dB) is expected to occur along one of the analyzed roadway segments (Cannon Road from El Camino Real to College Boulevard) as a result of the eventual extension of College Boulevard. A change of 3 dB is considered to be barely perceptible in the community environment. Thus the relative increase in the modeled traffic noise levels is considered to be relatively small, compared to existing conditions. Similarly, under the proposed General Plan in year 2035, distances from the street centerlines to the respective 60 dBA CNEL, 65 dBA CNEL, and 70 dBA CNEL noise contours would increase somewhat but not dramatically, compared with the baseline (existing) noise conditions. The distances to the 65 dBA CNEL noise contour would typically increase approximately 10 to 30 feet. The largest increase in the 65 dBA CNEL noise contour distance would be 90 feet (at Palomar Airport Road from Melrose Drive to the eastern city limits where the noise contour would increase from 360 feet (existing)to 450 feet in the year 2035 under the proposed General Plan; along Melrose Drive from the northern city limit (south of Sycamore Avenue) to Palomar Airport Road the noise contour would increase from 300 feet (existing) to 390 feet in the year 2035 under the proposed General Plan).

Compliance with the proposed General Plan Noise Element goals and policies would ensure that noise from traffic as well as other long-term sources does not cause a significant adverse effect at noise-sensitive land uses. For example, the proposed Noise Element's Land Use and Noise Compatibility Policies encourage the development of compatible land uses and requires the use of project design techniques such as increasing setback, use of non-sensitive buildings (e.g., garages) to shield noise-sensitive outdoor spaces from noise, etc.). The city would require each future project to comply with the proposed General Plan noise compatibility policies to reduce traffic and other noise levels. Compliance with the city's proposed General Plan goals and policies would reduce permanent noise impacts to less-than-significant levels.

Figure 3.10-3

PROPOSED GENERAL PLAN
Future Noise Contours



2035 Noise Contours

- 70 + CNEL
- 65 - 70 CNEL
- 60 - 65 CNEL
- Airport Noise Contour Lines
- Highways
- Major Street
- Planned Street
- Railroad
- City Limits

500 ACRES

100 ACRES

0 0.5 1 2

Miles

Source: DUDEK, 2013; City of Carlsbad, 2013; SANDAG, 2013; McClellan-Palomar Airport Land Use Compatibility Plan, 2010; Dyett & Bhatia, 2013.

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Proposed General Plan Policies that Reduce the Impact

Noise Element Policies

5-G.1 Protect public health and welfare by eliminating existing noise problems where feasible, maintaining an acceptable indoor and outdoor acoustic environment, and preventing significant degradation of the acoustic environment.

5-G.2 Ensure that new development is compatible with the noise environment, by continuing to use potential noise exposure as a criterion in land use planning.

5-G.3 Guide the location and design of transportation facilities, industrial uses and other potential noise generators to minimize the effects of noise on adjacent land uses.

5-P.1 **Acceptability of Use Location.** Use the noise and land use compatibility matrix ([General Plan] Table 5-1) and Future Noise Contours map ([General Plan] Figure 5-3) as criteria to determine acceptability of a land use, including the improvement/construction of streets, railroads, freeways and highways. Do not permit new noise-sensitive uses—including schools, hospitals, places of worship, and homes—where noise levels are "normally unacceptable" or higher, if alternative locations are available for the uses in the city.

5-P.2 **Required Noise Analysis.** Require a noise analysis be conducted for all discretionary development proposals (except for developments of single family homes with four units or fewer) located where projected noise exposure would be other than "normally acceptable".

A required noise analysis should:

a. Be prepared by a certified noise consultant or acoustical engineer;

b. Be funded by the applicant;

c. Include a representative, on-site day and night sound level measurement;

d. Include a delineation of current (measured) and projected (General Plan or 10 years in future, whichever horizon extends further out) noise contours;

e. Identify noise levels with and without the proposed project, ranging from 55 to 75 dBA (Ldn) within the proposed development site; and

f. If noise levels exceed the standards in Table 5-1 [General Plan], include a description of adequate and appropriate noise abatement measures to mitigate the noise to allowable levels for the proposed use.

5-P.3 **Noise-Attenuation.** For all projects that require discretionary review and have noise exposure levels that exceed the standards in [General Plan] Table 5-1,

require site planning and architecture to incorporate noise-attenuating features. With mitigation, development should meet the allowable outdoor and indoor noise exposure standards in [General Plan] Table 5-2. When a building's openings to the exterior are required to be closed to meet the interior noise standard, then mechanical ventilation shall be provided.

5-P.4 **Exterior Noise Levels Exceeding Acceptable Level.** If the noise analysis shows that exterior noise levels cannot be mitigated to an acceptable level as identified in [General Plan] Table 5-2, the development should not be approved without one or more of the following findings:

a. Changes or alterations have been required in, or incorporated into, the project that avoid or substantially lessen the noise.

b. Changes or alterations to avoid or substantially lessen noise are within the responsibility and jurisdiction of another public agency and not the City of Carlsbad. Such changes have been adopted by such other agency or can and should be adopted by such other agency.

c. Specific economic, social, or other considerations make infeasible the mitigation measures or project alternatives to avoid or substantially lessen noise.

If a project is approved with exterior noise levels exceeding the acceptable noise level, all purchasers of the impacted property shall be notified in writing prior to purchase, and by deed disclosure in writing, that the property they are purchasing is, or will be, impacted by noise and does not meet City of Carlsbad noise standards for residential property.

5-P.5 **Noise Generation.** As part of development project approval, require that noise generated by a project does not exceed standards established in [General Plan] Table 5-3.

5-P.7 **Mitigation Cost.** The City of Carlsbad shall not fund mitigation of existing or future noise impacts from streets, railroad, airport or any other source for existing or future private development within the city.

5-P.8 **Noise Guidelines Manual.** Update the Noise Guidelines Manual to ensure consistency with General Plan standards and policies, and contemporary practices.

5-P.9 Continue to enforce the California Motor Vehicle Code as it applies to excessive noise. The Carlsbad Police Department should continue to reduce the number of excessively noisy vehicles on city streets and deter persons from operating their motor vehicles in a noisy manner.

5-P.10 Consider noise impacts in the design of road systems and give special consideration to noise sensitive areas.

5-P.11 Review traffic flow systems and, wherever possible, synchronize signalization and/or implement other traffic flow improvements to avoid traffic stops and starts, and adjust traffic flow to achieve noise levels acceptable to surrounding areas.

Mitigation Measures

None required.

Table 3.10-8: Summary of Modeled Existing and Future with General Plan Traffic Noise Levels (CNEL)

					Existing			Year 2035		
Street	*Segment*	*Existing CNEL 100 Feet from Street Centerline / 200 Feet from Freeway Centerline (dBA)*	*Year 2035 CNEL 100 Feet from Street Centerline / 200 Feet from Freeway Centerline (dBA)*	*Change in Noise Levels - Proposed General Plan Year 2035 minus Existing (dB)*	*CNEL 70*	*CNE L 65*	*CNE L 60*	*CNE L 70*	*CNE L 65*	*CNE L 60*
Cannon Road	I-5 to El Camino Real	70	71	1	100	275	540	120	300	580
Cannon Road	El Camino Real to College Boulevard	69	68	-1	80	210	460	70	200	460
College Boulevard	Palomar Airport Road to El Camino Real	68	68	0	60	160	350	70	180	370
College Boulevard	Northern City Limits to Cannon Road	70	71	1	100	240	410	130	290	450
College Boulevard	Cannon Road to El Camino Real	n/a	71	n/a	n/a	n/a	n/a	130	300	460
Palomar Airport Road	I-5 to College Boulevard	74	75	1	210	460	770	240	480	770
Palomar Airport Road	College Boulevard to El Camino Real	73	74	1	170	400	650	200	450	710
Palomar Airport Road	El Camino Real to Melrose Drive	75	76	1	220	470	730	260	510	770
Palomar Airport Road	Melrose Drive to Eastern City Limits	72	74	2	150	360	590	200	450	650
El Camino Real	Northern City Limits to Tamarack Avenue	72	73	1	140	330	480	160	350	510
El Camino Real	Tamarack Avenue to Canon Road	71	72	1	120	290	450	160	340	510
El Camino Real	Cannon Road to College Boulevard	72	73	1	160	340	500	170	350	520
El Camino Real	College Boulevard to Palomar Airport Road	72	74	2	150	330	490	200	370	540

Table 3.10-8: Summary of Modeled Existing and Future with General Plan Traffic Noise Levels (CNEL)

					Existing			Year 2035		
Street	*Segment*	*Existing CNEL 100 Feet from Street Centerline / 200 Feet from Freeway Centerline (dBA)*	*Year 2035 CNEL 100 Feet from Street Centerline / 200 Feet from Freeway Centerline (dBA)*	*Change in Noise Levels - Proposed General Plan Year 2035 minus Existing (dB)*	*CNEL 70*	*CNE L 65*	*CNE L 60*	*CNE L 70*	*CNE L 65*	*CNE L 60*
El Camino Real	Palomar Airport Road to La Costa Avenue	74	75	1	210	390	560	250	410	600
El Camino Real	La Costa Avenue to Rancho Santa Fe Road	73	74	1	170	350	510	190	370	540
Carlsbad Boulevard	North of Carlsbad Village Drive	62	63	1	20	50	140	30	70	180
Carlsbad Boulevard	Carlsbad Village Drive to Tamarack Avenue	63	64	1	30	70	180	30	80	200
Carlsbad Boulevard	Tamarack Avenue to Cannon Road	65	66	1	30	100	240	50	120	290
Carlsbad Boulevard	Cannon Road to Palomar Airport Road	64	64	0	30	80	200	30	80	200
Carlsbad Boulevard	Palomar Airport Road to Poinsettia Avenue	67	68	1	60	150	340	60	170	350
Carlsbad Boulevard	Poinsettia Avenue to La Costa Avenue	68	69	1	70	180	360	90	220	390
Rancho Santa Fe Road	Palomar Airport Road to El Camino Real	70	71	1	100	240	470	110	270	490
La Costa Avenue	I-5 to El Camino Real	69	69	0	170	350	540	180	370	570
La Costa Avenue	El Camino Real to Rancho Santa Fe Road	63	63	0	30	60	160	30	70	180
Marron Road	West of El Camino Real	69	69	0	90	200	330	90	200	330
Carlsbad Village	Carlsbad Blvd to I-5	63	64	1	30	70	180	30	80	220

Table 3.10-8: Summary of Modeled Existing and Future with General Plan Traffic Noise Levels (CNEL)

					Existing			Year 2035		
Street	*Segment*	*Existing CNEL 100 Feet from Street Centerline / 200 Feet from Freeway Centerline (dBA)*	*Year 2035 CNEL 100 Feet from Street Centerline / 200 Feet from Freeway Centerline (dBA)*	*Change in Noise Levels - Proposed General Plan Year 2035 minus Existing (dB)*	*CNEL 70*	*CNE L 65*	*CNE L 60*	*CNE L 70*	*CNE L 65*	*CNE L 60*
Drive										
Carlsbad Village Drive	I-5 to El Camino Real	65	65	0	40	90	230	40	90	230
Carlsbad Village Drive	El Camino Real to College Blvd	61	61	0	30	40	120	40	50	120
Tamarack Avenue	Carlsbad Blvd to I-5	60	63	3	20	40	100	30	60	170
Tamarack Avenue	I-5 to El Camino Real	60	61	1	20	40	100	20	40	110
Tamarack Avenue	El Camino Real to Carlsbad Village Drive	64	65	1	30	80	200	30	80	200
Faraday Avenue	Cannon Road to College Blvd	63	64	1	30	70	180	30	90	220
Faraday Avenue	College Blvd to El Camino Real	66	66	0	40	110	260	40	120	260
Faraday Avenue	El Camino Real to Melrose Drive	67	69	2	50	140	290	80	200	340
Aviara Pkwy/Alga Road	Palomar Airport Road to Poinsettia Avenue	64	65	1	30	80	200	40	100	240
Aviara Pkwy/Alga Road	Poinsettia Avenue to El Camino Real	65	66	1	40	100	250	50	120	280
Aviara Parkway/Alga Road	El Camino Real to Melrose Drive	64	65	1	30	70	190	40	100	240
Camino Vida Roble	Palomar Airport Road to El Camino Real	63	64	1	30	70	190	30	90	210
Poinsettia Lane	Carlsbad Blvd to I-5	65	66	1	40	100	250	50	120	290

Table 3.10-8: Summary of Modeled Existing and Future with General Plan Traffic Noise Levels (CNEL)

					Existing			Year 2035		
Street	*Segment*	*Existing CNEL 100 Feet from Street Centerline / 200 Feet from Freeway Centerline (dBA)*	*Year 2035 CNEL 100 Feet from Street Centerline / 200 Feet from Freeway Centerline (dBA)*	*Change in Noise Levels - Proposed General Plan Year 2035 minus Existing (dB)*	*CNEL 70*	*CNE L 65*	*CNE L 60*	*CNE L 70*	*CNE L 65*	*CNE L 60*
Poinsettia Lane	I-5 to Aviara Parkway	70	71	1	100	240	390	120	280	420
Poinsettia Lane	Aviara Pkwy to El Camino Real	n/a	68	n/a	n/a	n/a	n/a	70	180	340
Poinsettia Lane	El Camino Real to Melrose Drive	69	70	1	80	200	360	100	250	390
Avenida Encinas	Cannon Road to Palomar Airport Road	62	64	2	30	60	160	30	80	210
Avenida Encinas	Palomar Airport Road to Poinsettia Avenue	61	62	1	20	50	120	20	60	150
Avenida Encinas	Poinsettia Avenue to Carlsbad Blvd	63	64	1	30	70	180	30	70	190
Paseo del Norte	Cannon Road to Palomar Airport Road	61	64	3	20	50	130	40	80	200
Paseo del Norte	Palomar Airport Road to Poinsettia Avenue	62	65	3	30	60	160	40	100	240
Melrose Drive	Sycamore Avenue to Palomar Airport Road	71	73	2	130	300	500	170	390	580
Melrose Drive	Palomar Airport Road to Poinsettia Avenue	70	70	0	90	220	450	120	280	490
Melrose Drive	Poinsettia Avenue to Alga Road	70	71	1	90	230	460	110	260	480
Melrose Drive	Alga Road to Rancho Santa Fe Road	73	74	1	160	380	570	200	420	610
I-5 Freeway	Las Flores Drive to Carlsbad Village Drive	79	79	0	710	980	1,360	720	990	1,370

Table 3.10-8: Summary of Modeled Existing and Future with General Plan Traffic Noise Levels (CNEL)

					Existing			Year 2035		
Street	*Segment*	*Existing CNEL 100 Feet from Street Centerline / 200 Feet from Freeway Centerline (dBA)*	*Year 2035 CNEL 100 Feet from Street Centerline / 200 Feet from Freeway Centerline (dBA)*	*Change in Noise Levels - Proposed General Plan Year 2035 minus Existing (dB)*	*CNEL 70*	*CNE L 65*	*CNE L 60*	*CNE L 70*	*CNE L 65*	*CNE L 60*
I-5 Freeway	Carlsbad Village Drive to Tamarack Avenue	79	79	0	730	1,010	1,420	740	1,030	1,430
I-5 Freeway	Tamarack Avenue to Cannon Road	79	79	0	710	980	1,360	720	1,000	1,380
I-5 Freeway	Cannon Road to Palomar Airport Road	79	79	0	690	930	1,250	700	950	1,280
I-5 Freeway	Palomar Airport Road to Poinsettia Lane	79	79	0	700	980	1,320	720	990	1,360
I-5 Freeway	Poinsettia Lane to La Costa Avenue	79	79	0	710	980	1,330	720	990	1,350
SR-78 Freeway	I-5 to Jefferson Street	77	78	1	570	800	1,100	620	860	1,190
SR-78 Freeway	Jefferson Street to El Camino Real	77	78	1	570	810	1,150	610	870	1,220
SR-78 Freeway	El Camino Real to College Boulevard	77	78	1	570	800	1,100	610	850	1,190

Source: Dudek 2013

Impact 3.10-2 Development under the proposed General Plan could expose persons to or generate excessive groundborne vibration or groundborne noise levels (*Less than Significant)*

Temporary (Construction Vibration)

Implementation of the proposed General Plan would allow for additional development that would generate groundborne vibration or groundborne noise during construction. Excessive groundborne vibration is typically caused by activities such as blasting, or the use of pile drivers during construction. Heavy machinery associated with more conventional construction activities (such as bulldozers, heavy trucks etc) typically produces negligible levels of groundborne vibration beyond a distance of approximately 25 feet. Construction under the proposed General Plan is not anticipated to require blasting activities, but pile driving could occur which could produce vibration that would be felt at nearby land uses. These vibrations pose not only a potential nuisance, but also a potential risk to proximate structures. However, these potential impacts would be assessed at the time specific development applications are submitted.

Construction activities associated with new development would be temporary in nature and related noise impacts would be short-term. However, since construction activities could substantially increase ambient noise levels at noise-sensitive locations, construction noise could result in potentially significant impacts to sensitive receptors. Groundborne vibration impacts associated with construction activities are also temporary in nature. Depending on the type of construction related machinery used, construction activity can result in varying degrees of vibration. The potential construction-related noise and vibration impacts depend on the proximity of construction activities to sensitive receptors, the presence of intervening barriers, the number, and the types and duration of construction equipment used. Construction under the proposed General Plan would be required to comply with noise limitations specified in the Carlsbad Municipal Code Noise Ordinance (CMC Chapter 8.48), resulting in a less than significant impact.

Permanent (Traffic and Other Sources)

Caltrans (2004) has studied the effects of vibration from heavy vehicles traveling on roadways and trains on nearby sensitive land uses. Caltrans noted that "heavy trucks, and quite frequently buses, generate the highest earthborne vibrations of normal traffic." Caltrans further noted that the highest traffic generated vibrations are along the freeways. They found that vibration measured on freeway shoulders (5 m or 16 feet from the centerline of the nearest lane) never exceeded 0.08 in/sec PPV. This level coincides with the maximum recommended "safe level" for ruins and ancient monuments (and historic buildings). Similarly, Caltrans found that the 0.08 in/sec PPV level for vibration from trains occurs at a distance of 25 feet from the rails. Because sensitive land uses are not anticipated to be sited within these distances, any potential for significant vibration impacts is less than significant.

The use of heavy equipment associated with certain industrial operations can create elevated vibration levels in their immediate proximity. While the level of this vibration is indeterminate, it would not be expected to exceed that of railroad operations. Railroad operations are shown to create vibration levels that are less than the most stringent Caltrans threshold levels at a distance of 25 feet from the rails. Any pieces of heavy vibration-causing equipment would be situated in excess of this distance from any sensitive land uses; additionally, the City's Municipal Code (Planned Industrial Zone, Chapter 21.34.090, Performance Standards) contains a provision (3) which specifies that "All uses shall be so operated as not

to generate vibration discernible without instruments by the average person while on or beyond the lot upon which the source is located or within an adjoining enclosed space if more than one establishment occupies a structure." Therefore, this impact is less than significant.

Impact 3.10-3 Development under the proposed General Plan would not increase noise levels by 3 dBA in areas that already exceed city standards and that would impact sensitive land uses. (*Less than Significant)*

As discussed in Impact 3.10-1, changes in traffic noise levels along the city's major roadways are predicted to range from -1 dB to 2 dB. None of the analyzed roadway segments (with the exception of the extensions of College Boulevard and Poinsettia Avenue) would experience an increase of 3 dB or more under the Year 2035 with General Plan traffic volumes. The College Boulevard extension (from Cannon Road to El Camino Real) and Poinsettia Avenue (Aviara Pkwy to El Camino Real) currently do not carry substantial levels of traffic; therefore, these segments do not exceed city noise standards.

Proposed Plan Policies that Reduce the Impact

Noise Element Policies

See policies 5-P.9 through 5-P.11, under Impact 3.10-1, above.

Mitigation Measures

None required.

Impact 3.10-4 Development under the proposed General Plan would not produce a substantial permanent, temporary or periodic increase in ambient noise levels above levels existing without the proposed General Plan. (*Less than Significant*)

As discussed in Impact 3.10-1, noise from traffic represents a real and potentially significant permanent noise impact and construction activities represents a real and potentially significant temporary noise impact to noise-sensitive receivers in Carlsbad. Compliance with the city's Noise Ordinance and the proposed General Plan goals and policies would reduce potential permanent and short-term noise impacts to less-than-significant levels.

Proposed General Plan Goals and Policies that Reduce the Impact

Noise Element Policies

See Goals 5-G.1 through 5-G.3 and Policies 5-P.1 through 5-P.5 and 5-P.7 through 5.P-11, under Impact 3.10-1, above.

Mitigation Measures

None required.

Impact 3.10-5 The proposed General Plan would not result in projects that expose persons residing or working in the project area to excessive noise levels due to the project's location in an airport land use plan area or within two miles of a public airport or public use airport. (*Less than Significant*).

McClellan-Palomar Airport is located within the city limits, in the central portion of the city. The McClellan-Palomar ALUCP includes development policies regarding the compatibility of development areas and exposure to noise (e.g., residential infill development shall not be allowed where exposure to noise levels of more than 65 dBA CNEL may occur). Additionally, compliance with the proposed General Plan Noise Element goals and policies would ensure that noise from the airport does not cause a significant adverse effect on noise-sensitive land uses. For example, the proposed General Plan Noise Element's Airport Noise Policies encourage the development of compatible land uses within the Airport Influence Area (AIA) as depicted in the ALUCP and require disclosure actions for new development in the AIA, such as avigation easements, deed restrictions and recorded notices. Compliance with the city's proposed General Plan goals and policies would reduce permanent noise impacts to less-than-significant levels.

Proposed General Plan Policies that Reduce the Impact

Noise Element Policies

5-G.4 Ensure long-term compatibility between the airport and surrounding land use.

5-P.12 Use the noise policies in the McClellan-Palomar Airport Land Use Compatibility Plan (ALUCP) to determine acceptability of a land use within the airport's influence area (AIA) as depicted in the ALUCP. Additional disclosure actions for new development in the AIA, such as avigation easements, deed restrictions, recorded notice, etc., are required of developers/sellers of noise impacted residential units.

5-P.13 For projects within the Airport Influence Area, utilize the noise standards contained in the McClellan-Palomar ALUCP, as well as the noise standards contained in this [Noise] element. However, reserve the right to overrule the ALUCP as provided for in State Public Utilities Code Section 21676.

5-P.14 Recognize that procedures for the abatement of aircraft noise have been identified in the Fly Friendly Program for McClellan-Palomar Airport. The city expects the widespread dissemination of, and pilot adherence to, the adopted procedures.

5-P.15 Expect the airport to control noise while the city shall control land-use thus sharing responsibility for achieving and maintaining long-term noise/land-use compatibility in the vicinity of McClellan-Palomar Airport.

5-P.16 Require new nonresidential development to comply with the noise compatibility criteria in the ALUCP. Require dedication of avigation easements for new developments designated as conditionally compatible for noise in the ALUCP, and which are located within the 65 dB CNEL noise contour as mapped on [General Plan] Figure 5-4: Airport Noise Compatibility Policy Map.

Mitigation Measures

None required.