4.5 NOISE

4.5.1 Introduction

This section evaluates the potential short-term and long-term noise impacts associated with the construction and operation of potential development that would be allowed under the proposed General Plan Land Use Element and Urban Design Element (LUE/UDE) (proposed project). This analysis evaluates potential noise impacts within the planning area by evaluating the effectiveness of mitigation measures incorporated as part of the design of the proposed project. This section is based on information provided in the Noise Element (1975) of the City of Long Beach's (City) General Plan, the Noise Ordinance of the City's Municipal Code (2015), and the *Noise Impact Analysis* (LSA Associates, Inc. [LSA], March 2016) (Appendix C) prepared for the project.

4.5.2 Methodology

Evaluation of noise impacts associated with the proposed project includes the following:

- Determination of the short-term construction noise levels at off-site, noise-sensitive uses and comparison to the City's Noise Ordinance requirements.
- Determination of the required mitigation measures to reduce short-term, construction–related noise impacts and long-term, operation-related noise impacts from all noise sources.

Characteristics of Sound. Sound is increasing to such disagreeable levels in the environment that it can threaten quality of life. Noise is usually defined as unwanted sound. Noise consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation, or sleep.

To the human ear, sound has two significant characteristics: pitch and loudness. Pitch is generally an annoyance, while loudness can affect the ability to hear. Pitch is the number of complete vibrations, or cycles per second, of a wave resulting in the tone's range from high to low. Loudness is the strength of a sound that describes a noisy or quiet environment and is measured by the amplitude of the sound wave. Loudness is determined by the intensity of the sound wave combined with the reception characteristics of the human ear. Sound intensity refers to how hard the sound wave strikes an object, which in turn produces the sound's effect. This characteristic of sound can be precisely measured with instruments. The analysis of a project defines the noise environment of the project area in terms of sound intensity and its effect on adjacent sensitive land uses.

Measurement of Sound. Sound intensity is measured through the A-weighted decibel (dBA) scale to correct for the relative frequency response of the human ear. That is, an A-weighted noise level de-emphasizes low and very high frequencies of sound similar to the human ear's de-emphasis of these frequencies. Unlike linear units, such as inches or pounds, decibels (dB) are measured on a logarithmic scale representing points on a sharply rising curve. For example, 10 dB is 10 times more intense than 1 dB, 20 dB is 100 times more intense, and 30 dB is 1,000 times more intense. Thirty dB represents 1,000 times as much acoustic energy as 1 dB. A sound as soft as human breathing is about 10 times greater than 0 dB. The decibel system of measuring sound gives a rough connection between

the physical intensity of sound and its perceived loudness to the human ear. A 10 dB increase in sound level is perceived by the human ear as only a doubling of the loudness of the sound. Ambient sounds generally range from 30 dB (very quiet) to 100 dB (very loud).

Sound levels are generated from a source, and their decibel level decreases as the distance from that source increases. Sound dissipates exponentially with distance from the noise source. For a single point source, sound levels decrease approximately 6 dB for each doubling of distance from the source. This drop-off rate is appropriate for noise generated by stationary equipment. If noise is produced by a line source, such as highway traffic or railroad operations, the sound decreases 3 dB for each doubling of distance in a hard site environment. Line-source noise in a relatively flat environment with absorptive vegetation decreases 4.5 dB for each doubling of distance.

There are many ways to rate noise for various time periods, but an appropriate rating of ambient noise affecting humans also accounts for the annoying effects of sound. However, the predominant rating scales for human communities in the State of California are the equivalent continuous sound level (L_{eq}) and the Community Noise Equivalent level (CNEL) or the day-night average level (L_{dn}) based on dBA. CNEL is the time-varying noise over a 24-hour period, with a weighting factor of 5 dBA applied to the hourly L_{eq} for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours) and a weighting factor of 10 dBA applied from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). L_{dn} is similar to the CNEL scale but without the adjustment for events occurring during the evening hours. CNEL and L_{dn} are normally interchangeable and within 1 dBA of each other.

Other noise rating scales of importance when assessing the annoyance factor include the maximum noise level (L_{max}), which is the highest exponential time-averaged sound level that occurs during a stated time period. The noise environments discussed in this analysis for short-term noise impacts are specified in terms of maximum levels denoted by L_{max}. L_{max} reflects peak operating conditions and addresses the annoying aspects of intermittent noise. It is often used together with another noise scale, or noise standards in terms of percentile noise levels, in noise ordinances for enforcement purposes. For example, the L_{10} noise level represents the noise level exceeded 10 percent of the time during a stated period. The L_{50} noise level represents the median noise level. Half the time the noise level exceeds this level, and half the time it is less than this level. The L_{90} noise level represents the noise level exceeded 90 percent of the time and is considered the background noise level during a monitoring period. For a relatively constant noise source, L_{eq} and L_{50} are approximately the same.

Noise impacts can be described in three categories. The first is audible impacts that refer to increases in noise levels noticeable to humans. Audible increases in noise levels generally refer to a change of 3 dB or greater because this level has been found to be barely perceptible in exterior environments. The second category, potentially audible, refers to a change in the noise level between 1 dB and 3 dB. This range of noise levels has been found to be noticeable only in laboratory environments. The last category is changes in noise levels of less than 1 dB, which are inaudible to the human ear. Only audible changes in existing ambient or background noise levels are considered potentially significant.

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. In comparison, 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 a feeling of pain in the ear. This is 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.

Vibration. Vibration refers to ground-borne noise and perceptible motion. Ground-borne vibration is almost exclusively a concern inside buildings and is rarely perceived as a problem outdoors, where the motion may be discernible, but without the effects associated with the shaking of a building there is less adverse reaction. Vibration energy propagates from a source through intervening soil and rock layers to the foundations of nearby buildings. The vibration then propagates from the foundation throughout the remainder of the structure. Building vibration may be perceived by occupants as motion of building surfaces, rattling of items on shelves or hanging on walls, or a low-frequency rumbling noise. The rumbling noise is caused by the vibrating walls, floors, and ceilings radiating sound waves. Building damage is not a factor for normal transportation projects, including rail projects, with the occasional exception of blasting and pile driving during construction. Annoyance from vibration often occurs when the vibration exceeds the threshold of perception by 10 dB or less. This is an order of magnitude below the damage threshold for normal buildings.

To distinguish vibration levels from noise levels, the unit is written as “vibration velocity decibels” (VdB). Human perception to vibration starts at levels as low as 67 VdB and sometimes lower. Annoyance due to vibration in residential settings starts at approximately 70 VdB. Ground-borne vibrations are almost never annoying to people who are outdoors. Although the motion of the ground may be perceived, without the effects associated with the shaking of the building, the motion does not provoke the same adverse human reaction.

Typical sources of ground-borne vibration are construction activities (e.g., blasting, pile driving and operating heavy-duty earthmoving equipment), steel-wheeled trains, and occasional traffic on rough roads. Problems with ground-borne vibration and noise from these sources are usually localized to areas within approximately 100 feet (ft) of the vibration source, although there are examples of ground-borne vibration causing interference out to distances greater than 200 ft (Federal Transit Administration [FTA] 1995). When roadways are smooth, vibration from traffic, even heavy trucks, is rarely perceptible. Ground-borne noise is not likely to be a problem because noise arriving via the normal airborne path usually will be greater than ground-borne noise.

Ground-borne vibration has the potential to disturb people as well as damage buildings. Although it is very rare for train-induced ground-borne vibration to cause even cosmetic building damage, it is not uncommon for construction processes such as blasting and pile driving to cause vibration of sufficient amplitudes to damage nearby buildings (FTA 1995). Ground-borne vibration is usually measured in terms of vibration velocity, either the root-mean-square (RMS) velocity or peak particle velocity (PPV). RMS is best for characterizing human response to building vibration, and PPV is used to characterize potential for damage.

Factors that influence ground-borne vibration and noise include the following:

- **Vibration Source:** Vehicle suspension, wheel types and condition, track/roadway surface, track support system, speed, transit structure, and depth of vibration source
- **Vibration Path:** Soil type, rock layers, soil layering, depth to water table, and frost depth
- **Vibration Receiver:** Foundation type, building construction, and acoustical absorption

Among the factors listed above, there are significant differences in the vibration characteristics when the source is underground compared to at the ground surface. In addition, soil conditions are known to have a strong influence on the levels of ground-borne vibration. Among the most important factors are the stiffness and internal damping of the soil and the depth to bedrock.

Experience with ground-borne vibration indicates that: (1) vibration propagation is more efficient in stiff, clay soils than in loose, sandy soils; and (2) shallow rock seems to concentrate the vibration energy close to the surface and can result in ground-borne vibration problems at large distances from the source. Factors such as layering of the soil and depth to the water table can have significant effects on the propagation of ground-borne vibration. Soft, loose, sandy soils tend to attenuate more vibration energy than hard, rocky materials. Vibration propagation through groundwater is more efficient than through sandy soils.

In extreme cases, excessive ground-borne vibration has the potential to cause structural damage to buildings. For buildings considered of particular historical significance or that are particularly fragile structures, the damage threshold is approximately 96 VdB; the damage threshold for other structures is 100 VdB.[1]

4.5.3 Existing Environmental Setting

Existing Project Site. The proposed project includes the entire City as it is an update to the City's General Plan and is intended to guide growth and future development through the year 2040. Specifically, the project proposes to update the City's current 1989 LUE and adopt an entirely new UDE into its General Plan. Through implementation of the LUE, the City is looking to target future growth in a few specific transit-rich corridors and districts in order to increase job density in commercial and industrial areas, improve the corridors, and maintain and improve the existing established neighborhoods. The LUE will replace land use designations with "PlaceTypes" that are more flexible and comprehensive, and will lead to a subsequent comprehensive Zoning Code update. Major land use changes proposed as part of the LUE are identified as "Major Areas of Change" and are illustrated on previously referenced Figure 3.3.

The City is also proposing to adopt a new UDE as part of its General Plan to replace its existing Scenic Routes Element (SRE). The UDE would work toward shaping the continued evolution of the urban environment in Long Beach while also allowing for a balance between the existing natural environment and new development. The UDE is interconnected with the LUE and will provide minimum design standards for the PlaceTypes and their respective component development types and patterns.

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[1] Harris, C.M., 1998. *Handbook of Acoustical Measurements and Noise Control.*

Existing Sensitive Land Uses in the Project Vicinity. Noise-sensitive receptors in the City include residences, schools, hospitals, churches, and similar uses that are sensitive to noise. Construction and operation of development allowed under the LUE could adversely affect nearby noise-sensitive land uses.

Overview of the Existing Noise Environment. In the City, the dominant source of noise is transportation noise, including vehicular traffic, rail, and airport noise. Industrial and mechanical equipment are also contributors to the noise environment in the City, as are intermittent sources such as construction equipment and leaf blowers. Noise from motor vehicles is generated by engine vibrations, the interaction between the tires and the road, and the exhaust systems. Airport-related noise levels are primarily associated with aircraft engine noise made while aircraft are taking off, landing, or running their engines while still on the ground. Existing noise sources are further discussed below.

Ambient Noise Levels. To assess existing noise levels, LSA conducted 11 short-term (15-minute) noise measurements in the City on February 11, 2016. The noise measurements were recorded at different locations within the City based on the Major Areas of Change identified in the LUE. Noise monitoring locations are shown in Figure 4.5.1. Noise measurement data collected during monitoring is summarized in Table 4.5.A. The short-term noise measurements indicate that ambient noise in the City ranges from approximately 62.0 dBA to 76.2 dBA L_{eq}. Traffic on surrounding roadways was reported as the primary noise source.

Existing Roadway Noise Levels. Motor vehicles, with their distinctive noise characteristics, are one of the primary sources of noise in the City. The amount of noise varies according to many factors, such as volume of traffic, vehicle mix (percentage of cars and trucks), average traffic speed, and distance from the receptor. Major contributing roadway noise sources include Interstate 710 (I-710), Interstate 405 (I-405), State Route 91 (SR-91), and local roadways, including Santa Fe Avenue, Atlantic Avenue, Alamitos Avenue, 7th Street, 2nd Street, Ocean Boulevard, and other arterial and collector roadways throughout the City.

Existing Rail Noise Levels. The City is also subject to operational rail noise. The Los Angeles County (County) Metropolitan Transportation Authority (Metro) Rail Blue Line passes north to south through the City along Long Beach Boulevard. The Blue Line's service hours are from approximately 4:45 a.m. until 1:00 a.m. on weekdays and from 4:45 a.m. until 2:00 a.m. on weekends. Land uses surrounding the rail line include multi- and single-family residential uses, commercial uses, the Senior Arts Colony, high-rise office towers, the Pacific Coast Campus of Long Beach City College, and the Long Beach Transit Mall. Seven different Metro stations serve local neighborhoods throughout the City. Activity on the Blue Line affects the ambient noise environment along the railroad alignment.

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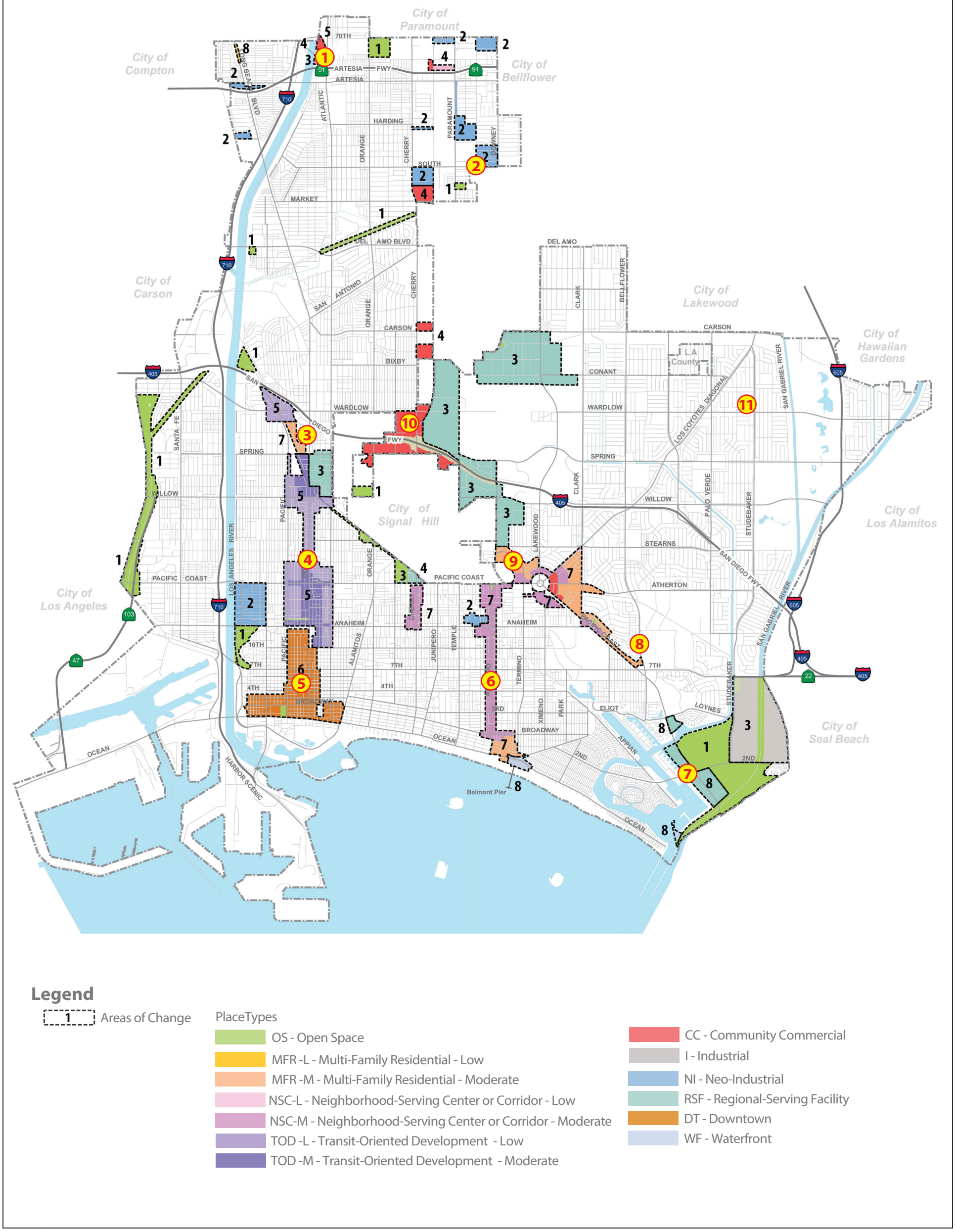

LSA

LEGEND

(#) - Noise Monitoring Location

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SOURCE: Proposed Land Use Element, City of Long Beach, June 2015

FIGURE 4.5.1

Long Beach General Plan
Land Use and Urban Design Elements
Noise Monitoring Locations

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Table 4.5.A: Ambient Noise Monitoring Results (dBA)

Location Number	Location Description	Start Time	L_{eq}[1]	L_{max}[2]	L_{min}[3]	Primary Noise Sources
ST-1	6857–6909 Atlantic Avenue	7:27 a.m.	66.6	82.1	59.6	Traffic on Atlantic Avenue, faint traffic on I-710, trucks with trailers turning in nearby lot
ST-2	3114 South Street (Church of Latter-Day Saints)	7:58 a.m.	70.3	80.8	53.6	Traffic on South Street, birds
ST-3	3115 Long Beach Boulevard	8:58 a.m.	63.6	73.6	49.2	Traffic on Long Beach Boulevard, backup beeper across Long Beach Boulevard, birds
ST-4	1940 Long Beach Boulevard	9:35 a.m.	65.7	80.9	45.0	Traffic on Long Beach Boulevard, birds, distant music
ST-5	614 Locust Avenue (in parking lot adjacent to 6th Street)	10:13 a.m.	63.3	77.3	47.7	Traffic on 6th Street, birds
ST-6	600 Redondo Avenue (in parking lot)	10:51 a.m.	64.0	81.5	45.5	Traffic on Redondo Avenue, car with loud music
ST-7	5800–6462 East Marina Drive (adjacent to 2nd Street, near bus stop)	2:11 p.m.	62.3	81.5	49.0	Traffic on 2nd Street, birds
ST-8	California State University, Long Beach, near Bellflower Boulevard and Beach Drive	1:15 p.m.	66.0	74.8	49.3	Traffic on Bellflower Boulevard, birds, music in car, horn
ST-9	3500 Hathaway Avenue (apartment complex open grass area)	11:42 a.m.	62.0	75.0	42.4	Traffic on Hathaway Avenue, distant music in apartment
ST-10	3245 Cherry Avenue (in parking area)	8:31 a.m.	76.2	99.3	61.3	Traffic on Cherry Avenue
ST-11	3401 Studebaker Road (in parking lot adjacent to Wardlow Road)	2:47 p.m.	62.5	79.2	46.9	Traffic on Wardlow Road, wind gusts up to 7.5 mph

Source: *Noise Impact Analysis*, LSA Associates, Inc. (March 2016) (Appendix C).
[1] L_{eq} represents the average of the sound energy occurring over the measurement time period.
[2] L_{max} is the highest sound level measured during the measurement time period.
[3] L_{min} is the lowest sound level measured during the measurement time period.
dBA = A-weighted decibels
I-710 = Interstate 710
mph = miles per hour

The Union Pacific Railroad line (UPRR) is located west of I-710. Land uses near the rail line include residential, commercial, and public facilities. Factors that influence the overall impact of railroad noise on adjacent uses include the distance of buildings from the tracks, the intermittent nature of train noise (e.g., engine, horns, and tracks), and the lack of sound walls or other barriers between the tracks and adjacent uses.

Existing Airport Noise Levels. Long Beach Airport is a public airport centrally located in the City, approximately 3 miles northeast of Downtown. This airport has limited passenger flights

and is restricted by ordinances that minimize airport-related noise. Although commercial flights are restricted, several charters, private aviation, flight schools, law enforcement flights, helicopters, advertising blimps, and planes towing advertising banners still frequently operate from this airport.

Other airports with aircraft activity that affect the ambient noise environment within the City limits include Los Angeles International Airport and John Wayne Airport. Los Angeles International Airport is located approximately 20 miles northwest of the City, and John Wayne Airport is located approximately 30 miles southwest of the City. Although noise from aircraft activity is occasionally audible throughout the City, the City is not located within the 65 dBA CNEL noise contour of these airports.

4.5.4 Regulatory Setting

Federal Regulations and Policies.

Federal Transit Administration and Federal Railroad Administration. Both the FTA in its *Transit Noise and Vibration Impact Assessment* (FTA, May 2006) and the Federal Railroad Administration (FRA) in its *High-Speed Ground Transportation Noise and Vibration Impact Assessment* (FRA, December 1998) included ground-borne vibration and noise impact criteria guidance, as shown in Table 4.5.B. Vibration impact criteria included in the FTA *Transit Noise and Vibration Impact Assessment* are used in this analysis for ground-borne vibration impacts on human annoyance, as shown in Table 4.5.B. The criteria presented in Table 4.5.B account for variation in project types as well as the frequency of events, which differ widely among projects. It is intuitive that when there will be fewer events per day, it should take higher vibration levels to evoke the same community response. This is accounted for in the criteria by distinguishing between projects with frequent and infrequent events, in which the term “frequent events” is defined as more than 70 events per day. The vibration impact levels indicated in Table 4.5.B are used as thresholds to determine acceptable levels for development adjacent to vibration sources. The criteria for environmental impact from ground-borne vibration and noise are based on the maximum levels for a single event.

United States Environmental Protection Agency. In 1972, Congress enacted the United States Noise Control Act. This act authorized the United States Environmental Protection Agency (EPA) to publish descriptive data on the effects of noise and establish levels of sound “requisite to protect the public welfare with an adequate margin of safety.” These levels are separated into health (hearing loss levels) and welfare (annoyance levels). For protection against hearing loss, 96 percent of the population would be protected if sound levels are less than or equal to 70 dBA during a 24-hour period of time. At 55 dBA L_{dn}, 95 percent sentence clarity (intelligibility) may be expected at 11 ft, with no community reaction. However, 1 percent of the population may complain about noise at this level and 17 percent may indicate annoyance. The EPA cautions that these identified levels are guidelines, not standards.

Table 4.5.B: Ground-borne Vibration and Noise Impact Criteria

Land Use Category	Ground-borne Vibration Impact Levels (VdB re 1 micro-inch/sec)		Ground-borne Noise Impact Levels (dB re 20 micro-Pascals)	
	Frequent[1] Events	Infrequent[2] Events	Frequent[1] Events	Infrequent[2] Events
Category 1: Buildings in which low ambient vibration is essential for interior operations (i.e., vibration-sensitive manufacturing, hospitals with vibration-sensitive equipment, and university research operation).	65 VdB[3]	65 VdB[3]	B[4]	B[4]
Category 2: Residences and buildings where people normally sleep.	72 VdB	80 VdB	35 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use.	75 VdB	83 VdB	40 dBA	48 dBA

Source: *Noise Impact Analysis*, LSA Associates, Inc. (March 2016) (Appendix C).
[1] Frequent events are defined as more than 70 events per day.
[2] Infrequent events are defined as fewer than 70 events per day.
[3] This criterion limit is based on levels that are acceptable for most moderately sensitive equipment, such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the heating, ventilation, and air-conditioning (HVAC) systems and stiffened floors.
[4] Vibration-sensitive equipment is not sensitive to ground-borne noise.
dB = decibels
dBA = A-weighted decibels
inch/sec = inches per second
VdB = vibration velocity decibels

State Regulations and Policies. The State of California has established regulations that help prevent adverse impacts to occupants of buildings located near noise sources. Referred to as the "State Noise Insulation Standard," these regulations require buildings to meet performance standards through design and/or building materials that would offset any noise source in the vicinity of the receptor. State regulations include requirements for the construction of new hotels, motels, apartment houses, and dwellings other than detached single-family dwellings that are intended to limit the extent of noise transmitted into habitable spaces. These requirements are found in California Code of Regulations (CCR) Title 24 (known as the California Building Standards Code), Part 2 (known as the California Building Code [CBC]), Appendix Chapters 12 and 12A. For limiting noise transmitted between adjacent dwelling units, the noise insulation standards specify the extent to which walls, doors, and floor/ceiling assemblies must block or absorb sound. For limiting noise from exterior noise sources, the noise insulation standards set an interior standard of 45 dBA CNEL in any habitable room with all doors and windows closed. In addition, the standards require preparation of an acoustical analysis demonstrating the manner in which dwelling units have been designed to meet this interior standard, where such units are proposed in an area with exterior noise levels greater than 60 dBA CNEL.

Local and Regional Policies and Regulations.

City of Long Beach Municipal Code. The City addresses noise impacts in Title 8: Health and Safety, Chapter 8.80, Noise, and sets regulations to minimize airport noise in Title 16: Public Facilities and Historical Landmarks, Chapter 16.43, Airport Noise Compatibility.[1] The Municipal Code establishes exterior and interior noise standards at receiving land uses and construction activity noise regulations as identified below.

[1] City of Long Beach. 2015. Municipal Code. September.

Chapter 8.80, Noise, establishes exterior and interior noise limits for the generation of sound within the City. The maximum noise levels vary based on the receiving land use type and the cumulative duration of noise. The ordinance also limits noise generated by construction. The Municipal Code restricts construction activities to weekdays between the hours of 7:00 a.m. and 7:00 p.m. and Saturdays between 9:00 a.m. and 6:00 p.m., except for emergency work. Construction work on Sundays is prohibited unless the City's Noise Control Officer issues a permit. The permit may allow work on Sundays between 9:00 a.m. and 6:00 p.m. Additionally, Chapter 16.43, Airport Noise Compatibility, establishes cumulative noise limits and noise budgets for properties in the vicinity of Long Beach Airport. The Municipal Code establishes a goal that incompatible property in the vicinity of the airport shall not be exposed to noise above 65 dBA CNEL.

Loading and unloading activities are also regulated under the Noise Ordinance. The ordinance states that loading, unloading, opening, closing, or other handling of boxes, crates, containers, building materials, garbage cans, or similar objects between the hours of 10:00 p.m. and 7:00 a.m. is restricted to the noise level provisions of the Exterior Noise Limits by land use district, as shown in Table 4.5.C (Table A of the Noise Ordinance), and to the Interior Noise Limits shown in Table 4.5.D (Table B of the Noise Ordinance).

Table 4.5.C: Exterior Noise Limits

Receiving Land Use District	Land Uses	Time Period	Noise Level (dBA)
District One	Predominantly residential, with other land use types also present	Night: 10:00 p.m.–7:00 a.m.	45
		Day: 7:00 a.m.–10:00 p.m.	50
District Two	Predominantly commercial, with other land use types also present	Night: 10:00 p.m.–7:00 a.m.	55
		Day: 7:00 a.m.–10:00 p.m.	60
District Three	Predominantly industrial, with other land types use also present	Any time	65
District Four	Predominantly industrial, with other land types use also present	Any time	70
District Five	Airport, freeways, and waterways regulated by other agencies	Regulated by other agencies and laws	

Source: City of Long Beach Municipal Code, Section 8.80.160.
Note: Limits for Districts Three and Four are intended primarily for use at their boundaries rather than for noise control within those districts.
dBA = A-weighted decibels

Table 4.5.D: Background Noise Correction

Difference Between Total Noise and Background Noise Alone (decibels)	Amount to Be Subtracted From
6–8	1
9–10	.5

Source: City of Long Beach Municipal Code, Section 8.80.160.

Additionally, the ordinance prohibits operating or permitting the operation of any device that creates vibration above the vibration perception threshold of an individual at or beyond the property boundary of the source if on private property or at 150 ft from the source if on a public space or public right-of-way.

City of Long Beach General Plan. The adopted City of Long Beach General Plan addresses noise in the Noise Element.[1] The Noise Element contains goals and policies for noise control and abatement in the City. The goals and policies contained in the Noise Element address noise in relation to land use planning, the noise environment, transportation noise, construction and industrial noise, population and housing noise, and public health and safety. General noise goals for Long Beach aim to attain a healthier and quieter environment for all citizens while maintaining a reasonable level of economic progress and development.[2]

The goals and categorical recommendations (i.e., policies) of the City's Noise Element that are applicable to the proposed project are identified in Table 4.5.E.

Table 4.5.E: City of Long Beach General Plan Noise Element Goals and Policies Applicable to the Project

General Noise Goals
Goal 1: To improve and preserve the unique and fine qualities of Long Beach and eliminate undesirable or harmful elements.
Goal 2: To develop a well-balanced community offering planned and protected residential districts…, well distributed commercial districts, planned and restricted industrial districts, and a coordinated circulation system for fast, safe, and efficient movement of people and commodities (General Plan [1961]).
Goal 3: To improve the urban environment in order to make Long Beach a more pleasant place to live, work, play and raise a family.
Goal 5: To develop specific neighborhood noise plans with the participation of resident citizen groups.
Goals Related to Land Use Planning
Goal 1: Provide the City with limited maximum noise levels by judicious land use planning policies.
Goal 2: Develop standards for local fixed point (stationary) noise sources.
Goal 3: Set measurable goals for the reduction of noise in problem areas.
Goal 4: Propose land uses or activities that would act as buffer zones between incompatible land uses.
Goal 5: Consider existing ambient noise levels before establishing specific permitted levels of sound.
Goal 6: Locate and mitigate noise impacts from highways and freeways on residential land uses and institutional, recreational and school facilities.
Goal 7: Identify and anticipate existing or proposed land uses that cause (directly and indirectly) noise-generating activities.
Goal 8: Promote the health and well-being of the people of Long Beach by adopting standards for the proper balance, relationship, and distribution of the various types of land uses…(General Plan [1961]).
Goal 9: Protect business and industrial areas against intrusions of non-business or non-industrial land uses which are highly sensitive to noise.

[1] City of Long Beach. 1975. Long Beach General Plan. March.
[2] Ibid.

Table 4.5.E: City of Long Beach General Plan Noise Element Goals and Policies Applicable to the Project

Goals Related to the Noise Environment
Goal 1: To prevent the loss of relatively quiet areas of Long Beach by regulating potential noise sources.
Goal 6: To describe the noise problem areas which are within local control.
Goal 7: To continue to take restorative measures to remedy and reduce high noise areas within the City.
Goals Related to Transportation Noise
Goal 1: Recommending a plan for compatible land uses for those portions of Long Beach within transportation noise zones.
Goal 2: Discouraging within transportation noise zones the development of noise sensitive uses that cannot be sufficiently insulated against externally generated noise at reasonable cost.
Goal 3: Developing long range re-allocation of noise sensitive land uses away from transportation noise impact areas.
Goal 4: Providing standards and criteria for noise emissions from transportation facilities.
Goal 8: Reducing the level of noise exposure from surface transportation in problem areas not preempted by State or Federal law.
Goal 9: Reducing the level of noise exposure from air operations and aircraft ground maintenance in problem areas no preempted by State and Federal law.
Goals Related to Construction and Industrial Noise
Goal 1: To reduce the level of noise exposure to the population caused by demolition and construction activities.
Goal 2: To reduce the level of outdoor noise exposure to the population generated by industries.
Goals Related to Population and Housing Noise
Goal 1: To reduce the level of outdoor noise exposure the population is subjected to.
Goal 2: To achieve greater indoor quietness in multiple dwelling residential buildings.
Goal 3: To reduce the level of noise generated by the population into the environment of the City.
Goal 5: To stimulate the redevelopment or refurbishment of blighted housing to create quieter neighborhoods and better soundproofed dwellings.
Goal 6: To require better sound deadening design on new housing units where acoustical problems could develop.
Goal 7: To reduce the level of incoming and outgoing noise into and from residential dwellings within the City.
Goal 9: To facilitate wherever feasible, noise standards that shall be employed in a manner consistent with proposed land uses, population densities and building types.
Goals Related to Public Health and Safety
Goal 1: To inform citizens of real and potential noise hazards, both physical (to the hearing system) and psychological (to the nervous system).
Goal 2: To regulate and control noise which is injurious to health or psychological well-being.
Goal 3: To continue to reduce excessive traffic noise in problem areas by the construction of sound barriers, further synchronization of traffic lights, and posting of "Quiet Zone" signs around hospitals and other highly noise sensitive land uses.
Goal 7: To advise citizens on noise-related problems, complaints and to suggest solutions on an individual basis.
Recommendations Related to Development Policies
4.1: Where incompatibility exists at present, action shall first be taken to change the noise environment.
4.2: Where incompatibility exists at present and future projections indicate that the noise environment cannot be reduced to create compatibility, every effort shall be made to change the development to achieve compatibility.
4.3: No future development shall be allowed which is incompatible with the existing or future noise environment unless the developer can show: a) The development can reasonably be expected to be compatible at some time in the near future; and b) Other factors favoring the development (social, environmental, for example) outweigh factors against the development.
4.4: No future development shall be allowed which causes other developments to become incompatible with their noise environments.

Source: City of Long Beach, General Plan Noise Element (1975).

4.5.5 Proposed Land Use Element and Urban Design Element Goals, Strategies, and Policies

The following proposed goals, strategies, and policies are applicable to the analysis of noise impacts throughout the City.

Land Use Element.

- **LU Policy 8-1:** Protect neighborhoods from the encroachment of incompatible activities or land uses that may have negative impacts on residential living environments.
- **LU Policy 15-4:** Work with regional agencies, residents, and businesses to preserve established homes, businesses, and open spaces; limit the exposure of toxic pollutants and vehicle noise and minimize traffic issues impacting residential neighborhoods as a result of the I-710 Freeway expansion.
- **Bixby Knolls Land Use Strategy 1:** Continue to monitor noise levels and implement the Long Beach Noise Ordinance, especially as it pertains to noise generated from airport-related activities.
- **Westside and Wrigley Land Use Strategy 6:** Uses allowed in the Edison and UPRR utility rights-of-way must be designed to have minimal dust, noise, traffic, visual and other nuisance impacts on residential neighbors. These properties shall be screened with landscape (green) buffers and proactively maintained.
- **Central Land Use Strategy 3:** Direct future multi-family developments to existing locations and locations served by public transit, especially near regional-serving centers.
- **Downtown Land Use Strategy 7:** Continue to implement the Downtown Plan (2012) and anticipate that most changes here will occur in the areas surrounding the Metro Blue Line fixed rail route. The Downtown and Transit-Oriented Development (TOD) PlaceTypes recommended in this land use plan encourage higher density infill developments and taller buildings appropriate in walkable, transit-connected urban centers.

Urban Design Element.

- **Policy UD 14-2:** Acknowledge transitions between commercial and residential uses by transitioning in height, scale, and intensity in a thoughtful way to provide a buffer to lower density residential development and transition from higher to lower density.
- **Policy UD 14-4**: Protect neighborhoods from the encroachment of incompatible activities or land uses that may have negative impacts on the residential living environment.
- **Policy UD 14-5:** Promote commercial center and corridor development compatibility with adjacent residential uses, including ensuring that project design and function minimizes the potential adverse impacts of vehicle access, parking and loading facilities, building massing, signage, lighting, trash enclosures and noise generating uses and areas.
- **Policy UD 19-2:** Ensure that project site design and function minimizes the potential adverse impacts of vehicle access, parking and loading facilities, signage, lighting, trash enclosures, and sound systems.

- **Policy UD 22-1:** Encourage the massing of buildings and setbacks behind the Long Beach Boulevard light rail corridor to transition from moderate to low, in order to gracefully handle the transition from more intense to less intense development.
- **Policy UD 23-1:** Provide adequate setbacks, along with visual and noise buffers, to separate automobile-oriented developments from adjacent residential neighborhoods.
- **Policy UD 24-3**: Promote the incorporation of buffers between residential and industrial uses, such as surface parking, landscaped open space buffers, and lower buildings.
- **Policy UD 24-5:** Encourage incompatible land uses and operations to be located away from and screened from view of residential neighborhoods.
- **Policy UD 26-2:** Encourage separation of incompatible land uses with site planning strategies and appropriate design treatments.

4.5.6 Thresholds of Significance

The following thresholds of significance are based on Appendix G of the *State California Environmental Quality Act (CEQA) Guidelines*. Based on these thresholds, implementation of the proposed project would have a significant adverse impact with respect to noise if it would:

Threshold 4.5.1: Expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies

Threshold 4.5.2: Expose persons to or generate excessive groundborne vibration or groundborne noise levels

Threshold 4.5.3: Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project

Threshold 4.5.4: Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project

Threshold 4.5.5: 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, expose people residing or working in the project area to excessive noise levels

Threshold 4.5.6: For a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels

4.5.7 Standard Conditions and Project Design Features

No Standard Conditions or Project Design Features (PDFs) have been identified with respect to noise; however, the update to the LUE includes two additional policies to address long-term stationary noise and ground-borne vibration from rail facilities:

LU Policy 15-5: Prior to project approval for projects subject to CEQA review, an acoustical analysis would be required for all noise sensitive projects located in an area with noise levels greater than 60 dBA CNEL. All new residential land uses shall be designed to maintain a standard of 45 dBA L_{dn} or less in building interiors. Noise reduction measures to achieve this noise level could include, but are not limited to, forced air ventilation so that windows can remain closed and/or upgraded wall and window assemblies.

LU Policy 15-6: Prior to approval of any new development within 200 feet of the Metro rail line, the City of Long Beach shall require applicants to submit plans to Metro, consistent with Metro's Adjacent Construction Design Manual, and to conduct a vibration assessment demonstrating that FTA Ground-borne Vibration Impact Criteria for the proposed land use are not exceeded. If necessary, the vibration assessment shall demonstrate project modifications required to ensure criteria compliance. At the City's discretion and Metro's request, a Noise Easement may be required to deed Metro the right to cause in said easement noise, vibrations, and other effects that may be caused by the operation of public transit vehicles.

4.5.8 Project Impacts

Threshold 4.5.1: Expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies

Less than Significant Impact. As described in Chapter 3.0, Project Description, of this Draft Environmental Impact Report (EIR), major land use changes proposed as part of the LUE/UDE are identified as Major Areas of Change and include eight primary change areas associated with the updated LUE.

- The first Major Area of Change involves the creation of more open space throughout the City. Areas targeted for the establishment of the Open Space PlaceType include small pockets of land along the Los Angeles River, two strips of land along State Route 103 and an abandoned railroad in the northern area of the City, a large portion of the Southeast Area Development and Improvement Plan (SEADIP) area, and pockets of land scattered throughout the City.
- The second Major Area of Change proposes to buffer industrial activities from existing neighborhoods by encouraging the conversion of some industrial uses to neo-industrial uses. Areas targeted for the establishment of the Neo-Industrial PlaceType include existing industrial areas in the northern portion of the City and a larger industrial area along the Los Angeles River, just north of the City's Downtown.
- The third Major Area of Change aims to promote regional-serving uses by maintaining existing regional-serving facilities throughout the City.
- The fourth Major Area of Change proposes to provide land use transitions from industrial to commercial uses in small areas in the northern portion of the City and in the area directly east of Long Beach Airport.

- The fifth Major Area of Change aims to promote TOD along Long Beach Boulevard as part of a larger citywide effort to reduce automobile dependence in the City.
- The sixth Major Area of Change aims to continue development in the Downtown area.
- The seventh Major Area of Change aims to promote infill and redevelopment to support transit along Redondo and Cherry Avenues and near the Traffic Circle.
- The eighth Major Area of Change aims to redevelop sites within the City to their "highest and best use." The sites targeted for redevelopment are located within the SEADIP area, in the southeastern portion of the City.

In total, the LUE proposes changes to approximately 13 percent of the land area (or the equivalent of 4,180 acres) in the City. Construction associated with implementation of the LUE would occur over a period of approximately 15 to 24 years.

Short-Term Construction-Related Noise Impacts. Two types of short-term noise impacts could occur during construction of potential development allowed by the LUE. First, construction crew commutes and the transport of construction equipment and materials to the site for future projects would incrementally increase noise levels on access roads leading to the sites. Although there would be a relatively high single-event noise exposure potential causing intermittent noise nuisance (passing trucks at 50 ft would generate up to a maximum of 87 dBA), the effect on longer-term (hourly or daily) ambient noise levels would be small. Therefore, short-term construction-related impacts associated with worker commute and equipment transport to future project sites would be less than significant and no mitigation is required.

The second type of short-term noise impact is related to noise generated during demolition, site preparation, excavation, grading, and building erection on the future project sites. Construction is completed in discrete steps, each of which has its own mix of equipment and, consequently, its own noise characteristics. These various sequential phases would change the character of the noise generated on the site and, therefore, the noise levels surrounding the site as construction progresses. 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.

As shown below in Table 4.5.F, typical construction noise levels range up to 99 dBA L_{max} at 50 ft from construction during the noisiest construction phases. The site preparation phase, which would include excavation and grading, tends to generate the highest noise levels because the noisiest construction equipment is earthmoving equipment. Earthmoving equipment includes excavating machinery such as backfillers, bulldozers, and front loaders. Earthmoving and compacting equipment includes compactors, scrapers, and graders. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full-power operation followed by 3 or 4 minutes at lower power settings.

Table 4.5.F: Typical Construction Equipment Maximum Noise Levels (L_{max})

Type of Equipment	Range of Maximum Sound Levels (dBA at 50 feet)	Suggested Maximum Sound Levels for Analysis (dBA at 50 feet)
Pile drivers	81 to 96	93
Rock drills	83 to 99	96
Jackhammers	75 to 85	82
Pneumatic tools	78 to 88	85
Pumps	74 to 84	80
Scrapers	83 to 91	87
Haul trucks	83 to 94	88
Cranes	79 to 86	82
Portable generators	71 to 87	80
Rollers	75 to 82	80
Dozers	77 to 90	85
Tractors	77 to 82	80
Front-end loaders	77 to 90	86
Hydraulic backhoe	81 to 90	86
Hydraulic excavators	81 to 90	86
Graders	79 to 89	86
Air compressors	76 to 89	86
Trucks	81 to 87	86

Source: *Noise Impact Analysis*. LSA Associates, Inc. (March 2016) (Appendix C).
dBA = A-weighted decibels
L_{max} = maximum instantaneous noise level

Construction allowed under the LUE is expected to require the use of earthmovers, bulldozers, and water and pickup trucks. The maximum noise level generated by each scraper on future project sites would be approximately 87 dBA L_{max} at 50 ft from the scraper. Each bulldozer would generate approximately 85 dBA L_{max} at 50 feet. The maximum noise level generated by water and pickup trucks would be approximately 86 dBA L_{max} at 50 ft from these vehicles. Each doubling of the sound sources with equal strength increases the noise level by 3 dBA. Assuming that each piece of construction equipment operates at some distance from the other equipment, the worst-case combined noise level during this phase of future construction would be 91 dBA L_{max} at a distance of 50 ft from the active construction area.

Construction noise is permitted by the City's Municipal Code when activities occur between the hours of 7:00 a.m. and 7:00 p.m. on weekdays and between 9:00 a.m. and 6:00 p.m. on Saturdays. No construction would be permitted on Sundays. Construction activities associated with development allowed under the LUE would be subject to compliance with the City's Noise Ordinance to ensure that noise impacts from construction sources are reduced to a less than significant level. No mitigation is required.

Long-Term Stationary-Source Noise Impacts. Development allowed under the proposed LUE may include the installation or creation of new stationary sources of noise, or could include the development of new sensitive land uses in the vicinity of existing noise sources. For commercial or industrial uses, these noise sources could include loading/unloading operations, generators, and

outdoor speakers; for residential uses, stationary noise sources may include air conditioners or pool pumps. These stationary sources of noise would have the potential to disturb adjacent sensitive receptors. However, noise generation would continue to be limited by the City's Noise Ordinance, Chapter 8.80.

Implementation of the LUE is not anticipated to result in increased railroad operations within the City. However, the LUE proposes the TOD PlaceType, which would allow future multifamily developments to be located along the Metro Blue Line fixed rail route. Locating multifamily developments near the light-rail corridor could expose sensitive land uses to operational rail noise.

The City's Municipal Code addresses noise in Title 8: Health and Safety, Chapter 8.80, Noise. The primary objective of Chapter 8.80 is to establish exterior and interior noise standards at receiving land uses and construction activity noise regulations. In addition to the policies identified the Noise Element of the General Plan to minimize the effects of noise on noise-sensitive uses, the LUE/UDE includes the following policies and land use strategies to protect sensitive receptors from stationary noise sources and encourage land use compatibility: LU Policy 8-1, LU Policy 15-4, Bixby Knolls Land Use Strategy 1, Westside and Wrigley Land Use Strategy 6, Central Land Use Strategy 3, Downtown Land Use Strategy 7, Policy UD 14-2, Policy UD 14-4, Policy UD 14-5, Policy UD 19-2, Policy UD 22-1, Policy UD 23-1, Policy UD 24-3, Policy UD 24-5, and Policy UD 26-2 (refer to Subsection 4.5.5).

Development allowed by the LUE and UDE may include the development of new sensitive land uses in the vicinity of existing noise sources and could potentially subject sensitive land uses to long-term noise impacts. However, several of the LUE and UDE policies, specifically Policy UD 26-2, require new development projects to incorporate site planning and project design strategies to separate or buffer neighborhoods from incompatible activities or land uses. Furthermore, to ensure new development would meet the interior noise standards identified by the State, the LUE has incorporated LU Policy 15-5 (as described further above). LU Policy 15-5 requires that all new developments in areas with noise levels greater than 60 dBA CNEL prepare an acoustical analysis and requires new residential land uses to be designed to maintain a standard of 45 dBA L_{dn} or less in building interiors. In addition, any new noise-generating sources would be subject to compliance with Chapter 8.80, Noise (including Table A: Exterior Noise Limits), of the City's Municipal Code (Table 4.5.C of this Draft EIR), which sets exterior noise standards for the various land uses within the City. As discussed above, implementation of the LUE/UDE would include policies and strategies that protect sensitive receptors from stationary noise sources in excess of acceptable levels. Therefore, implementation of the LUE/UDE would not expose persons to noise levels in excess of the City's Municipal Code and no mitigation measures are required.

Threshold 4.5.2: Expose persons to or generate excessive groundborne vibration or groundborne noise levels

Less than Significant Impact. As previously described, common sources of ground-borne vibration and noise include trains and construction activities such as blasting, pile driving, and operating heavy earthmoving equipment. Typically, the main effect of ground-borne vibration and noise is to cause

annoyance for occupants of nearby buildings. Ground-borne noise and vibration from construction activity would be mostly low to moderate except if pavement breaking or sheet-pile vibration is used on a site. Bulldozers and other heavy-tracked construction equipment generate approximately 92 VdB of ground-borne vibration when measured at 50 ft, based on the *Transit Noise and Vibration Impact Assessment* (FTA, May 2006). This level of ground-borne vibration exceeds the threshold of human perception, which is approximately 67 VdB. Based on the California Department of Transportation's (Caltrans) *Transportation Related Earthborne Vibration, Technical Advisory* (Rudy Hendricks, July 24, 1992), the vibration level at 100 ft is approximately 6 VdB lower than the vibration level at 50 ft. Vibration at 200 ft from the source is more than 6 VdB lower than the vibration level at 100 ft, or more than 12 VdB lower than the vibration level at 50 ft. Therefore, receptors at 100 ft and 200 ft from the construction activity may be exposed to ground-borne vibration up to 86 VdB and 80 VdB, respectively. Although this range of ground-borne vibration levels would result in potential annoyance at nearby receptors within these distances from construction activity, it would not cause any damage to buildings. Construction vibration, similar to vibration from other sources, would not have any significant effects on outdoor activities, such as those in the outdoor play area in the park adjacent to the project site.

Construction of future projects associated with implementation of the LUE/UDE could result in the generation of ground-borne vibration. However, Chapter 8.80 of the City's Noise Ordinance limits the operation of any device that creates vibration above the vibration perception threshold of 67 VdB. Any construction activities associated with implementation of the LUE/UDE would be required to comply with the Noise Ordinance requirements. Therefore, impacts from typical construction methods would not result in the exposure of sensitive receptors to excessive ground-borne vibration or noise levels, and no mitigation is required.

As noted in the *Noise Impact Analysis* (LSA, March 2016), potential ground-borne vibration and noise impacts may also occur from rail activity because the LUE/UDE would include TOD along the Metro Blue Line. Vibration levels inside proposed buildings would depend on the existing vibration levels and proposed building construction techniques. Based on the methodology for a "general vibration assessment" in the FTA guidance manual, vibration levels inside buildings are typically less than the vibration levels in the ground.[1] It is possible the existing ground-borne vibration levels would exceed maximum acceptable vibration levels for residential and institutional land uses. Impacts associated with ground-borne vibration and noise produced by rail rapid transit, such as the Metro Blue Line, are usually limited to areas within approximately 200 ft of the vibration source.[2] To ensure new land uses adjacent to the rail line are not exposed to excessive ground-borne vibration, LU Policy 15-6 has been incorporated into the LUE of the General Plan. Specifically, LU Policy 15-6 requires that new development within 200 ft of the Metro rail line conduct a vibration assessment demonstrating that FTA Ground-borne Vibration Impact Criteria for the proposed land use are not exceeded. If necessary, the vibration assessment shall also demonstrate project modifications required to ensure criteria compliance.

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[1] Federal Transit Administration. 2006. *Transit Noise and Vibration Impact Assessment.* May.
[2] Ibid.

As discussed above, implementation of the LUE and UDE would include policies and strategies that protect sensitive receptors from vibration in excess of acceptable levels. Therefore, implementation of the LUE/UDE would not expose persons to excessive ground-borne vibration and/or ground-borne noise levels, and no mitigation is required.

Threshold 4.5.3: Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project

Less than Significant Impact.

Long-Term Off-Site Traffic Noise Impacts. The *Noise Impact Analysis* (Appendix C) prepared for the proposed project evaluated traffic-related noise conditions along the roadway segments that are considered to be major noise-contributing sources. Potential sources of a permanent increase in ambient noise include increases associated with an increase in traffic on roadways in the plan area. It is projected that traffic volumes on some streets within the City would increase due to the growth envisioned in the LUE/UDE. This increase in traffic volumes would result in greater traffic noise levels compared to existing conditions.

The significance criteria define a significant impact as occurring if the project would result in a substantial (3 dBA or greater) permanent increase in ambient noise levels in the project vicinity above levels existing without the project. For traffic noise to increase by 3 dBA, traffic volumes would have to double. As previously identified, noise increases of 3 dBA or more are generally considered to be the smallest increases in noise levels readily perceptible in suburban or urban outdoor environments. The *Traffic Impact Analysis* (LSA, March 2016) (Appendix E) prepared for the project indicates that most Major Areas of Change would result in an increase in average daily trips. The SEADIP area would experience the highest average daily trip increase (29 percent). The anticipated increase in traffic volumes associated with the LUE/UDE would be less than a doubling of traffic, resulting in a noise increase of less than 3 dBA; therefore, implementation of the LUE/UDE is not expected to result in the generation of substantial traffic noise increases. Thus, implementation of the LUE/UDE would not result in a permanent increase in ambient noise levels, and no mitigation is required.

Threshold 4.5.4: Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project

Less than Significant Impact. As described in Threshold 4.5.1, maximum combined noise levels from proposed project-related construction activities could reach up to 91 dBA L_{max} at 50 ft for limited times during future construction. As concluded above, construction noise is permitted by the City's Municipal Code when activities occur between the hours of 7:00 a.m. and 7:00 p.m. on weekdays and between 9:00 a.m. and 6:00 p.m. on Saturdays. No construction would be permitted on Sundays. Construction activities associated with development allowed under the LUE would be subject to compliance with the City's Noise Ordinance to ensure that noise impacts from construction sources are reduced to a less than significant level. No mitigation is required.

Threshold 4.5.5: **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, expose people residing or working in the project area to excessive noise levels;**

OR

Threshold 4.5.6: **For a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels**

No Impact. As previously described, aircraft noise in the City of Long Beach is primarily related to aircraft operations at Long Beach Airport, Los Angeles International Airport, and John Wayne Airport. Long Beach Airport is located centrally within the City, approximately 3 miles northeast of the Downtown area. As stated in the Municipal Code, sensitive receptors are not permitted within the 65 dBA CNEL contour of Long Beach Airport. Implementation of the LUE/UDE would locate business parks and airport-related land uses surrounding the airport and would not introduce any new noise-sensitive receptors within the 65 dBA noise contour. Therefore, the LUE/UDE would not result in the exposure of sensitive receptors to excessive noise levels from aircraft noise sources. No mitigation measures are required.

4.5.9 Mitigation Measures

In the absence of a significant impact, no mitigation measures have been identified for noise.

4.5.10 Cumulative Impacts

As defined in the *State CEQA Guidelines*, cumulative impacts are the incremental effects of an individual project when viewed in connection with the effects of past, current, and probable future projects. A cumulative noise or vibration impact would occur if multiple sources of noise and vibration combine to create impacts in close proximity to a sensitive receptor. Therefore, the cumulative area for noise impacts is the City's General Plan planning area and any sensitive receptors within the planning area.

The proposed project would not create a cumulatively considerable contribution to regional noise conditions. For traffic noise to increase by 3 dBA, traffic volumes would have to double. Implementation of the proposed project would not result in a doubling of average daily trips. Therefore, implementation of the LUE/UDE would not result in a 3 dBA increase in traffic noise levels in the City and would not generate a significant impact under cumulative noise conditions.

Additionally, as shown in the traffic noise impact discussion above, implementation of the LUE/UDE policies and land use strategies would require the City to consider noise and land use compatibility issues when evaluating individual development proposals. As described above, implementation of the LUE/UDE would not result in a substantial cumulative increase in noise. Therefore, under cumulative conditions, implementation of the proposed General Plan LUE/UDE would result in a less than significant cumulative impact.

4.5.11 Level of Significance After Mitigation

The proposed project would not result in significant unavoidable adverse impacts related to noise or vibration.